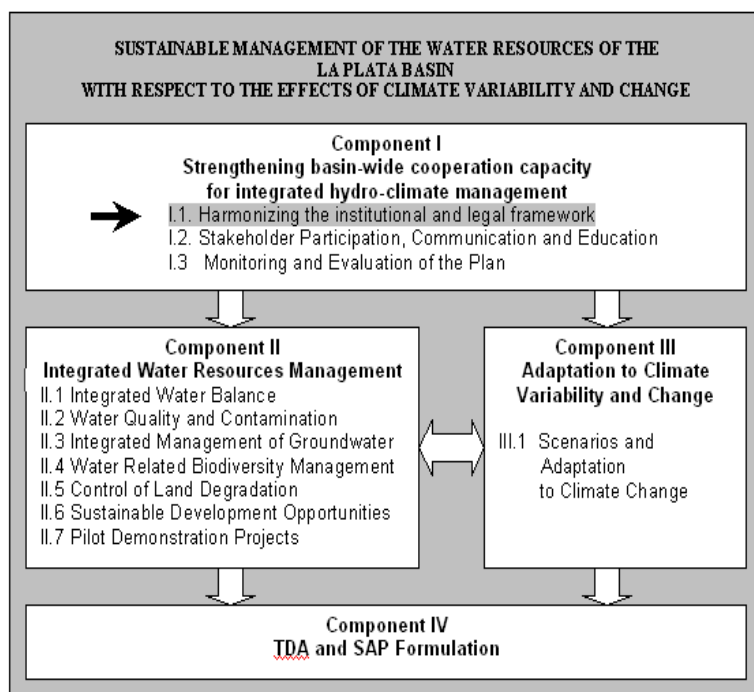


**SUB-COMPONENT  
I.1  
Harmonizing the Institutional and Legal Framework**

**Part 1: Project Identifiers**

1.1 Sub-component title: Harmonizing the Institutional and Legal Framework  
1.2 Link to umbrella project: Sub-component under Component 1 (Strengthening basin-wide cooperation capacity for integrated hydro-climate management).



1.3 Geographical scope: La Plata basin  
1.4 Executing Agency/entity: CIC in cooperation with the following national institutions:  
 Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.  
 Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.  
 Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).  
 Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.  
 Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).  
1.5 Duration: 5 years  
1.6 Focal area(s): Multifocal area, including IW and SPA  
1.7 GEF grant: US\$ 1,958,756  
1.8 Co-financing: US\$ 2,960,850  
1.9 Total funding: US\$ 4,919,606  
1.10 Associated financing: None

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**1.12 Sub-component summary:** Sub-component I.1 will establish the necessary technical and legal conditions to strengthen the capacities of the CIC, participating national institutions and organizations for integrated hydro-climate management in the La Plata Basin (LPB) and for the formulation of the SAP, and its subsequent implementation. The elements included in this Sub-component will strengthen capacities for management and information sharing in harmonizing the La Plata Basin legal framework for integrated water resources management, based upon plausible climate change scenarios, providing for coordination and oversight in Project execution. The main **outcome** will contribute to institutionalizing the necessary legal and administrative tools, providing a support system for decision making regarding sustainable use of the land and water resources of the LPB, in scenarios of climate variability and change. The project, through its sub-component I.1 covers the incremental activities that make possible the process of strengthening the Office of the Secretary General of the CIC and the national offices involved in the system, to coordinate the work related to: i) technical institutional and capacity building; ii) agreeing upon conceptual, legal and institutional frameworks; iii) operationalizing a Decision Support System and, iv) project management.

**Summary Table of Sub-component Work Elements, Outputs and Outcomes**

Work Element	Output	Outcome
I.1.1. Technical Institutional and Capacity Building	Strengthened technical institutional capacity for PLB-IWRM	Strengthened institutional capacities CIC, National coordinators, and Working Groups, increases the number and scope of coordinated agreements and collaborated actions identified SAP
I.1.2. Harmonization of Legal Frameworks	Conceptual Legal Framework	With informed capacity, riparians, through the CIC, agree to recommendations for compatible legal agreements that identify specific climate and water management actions for the LPB
I.1.3. Decision Support System (DSS)	Decision Support System (DSS)	An agreed to operationalized multi-sectoral decision support system (DSS)

**Summary Table of Subcomponent Work Elements, Funding Sources and Costs**

Work Element	Sources of funding (US\$)						Total (US\$)
	GEF Funding		Co-financing <sup>1</sup>		Government Counterpart		
I.1.1. Technical institutional and capacity building	1,264,756	23%	47,000	1%	2,299,750	48%	3,462,626
I.1.2. Harmonization of Legal Frameworks.	60,000	1%	0	0%	79,500	2%	139,500
I.1.3. Decision Support System (DSS)	634,000	13%	90,000	2%	44,4600	9%	1,168,600
<b>TOTAL US\$</b>	<b>1,958,756</b>	<b>38%</b>	<b>137,000</b>	<b>3%</b>	<b>2,823,850</b>	<b>59%</b>	<b>4,919,606</b>

<sup>1</sup> OAS

## Part 2: Sub-Component design

### 2.1 Background and context:

Background and introduction. The GEF PDF-B supported activities executed between 2003 and 2005 have enabled the CIC, in cooperation with the La Plata Basin countries, to agree on a **Vision** for the Basin. In addition, these activities have allowed for the completion of a macro-diagnostic analysis of the Basin that identifies the main transboundary problems and their causes (**Macro-Transboundary Diagnostic Analysis**).<sup>2</sup> These outputs, documented on the the CIC's website ([www.cicplata.org](http://www.cicplata.org)), form the first comprehensive overview at the macro scale of this 3 million km<sup>2</sup> river basin in the 21<sup>st</sup> Century. Strong anthropogenic interventions have accelerated the natural dynamic of the Basin and resulted in severe environmental impacts, that increase social problems, and threaten the environmental sustainability of the Basin, with the subsequent erosion of its physical and biological resources. The condition of the hydrological system was confirmed through a wide ranging participatory process.

The Macro-Transboundary Diagnostic Analysis identified nine risks faced by the countries and communities of the La Plata Basin. Amongst the present, critical and emerging issues are:

- **Extreme hydrologic events linked to climate variability and climate change**, particularly in terms of the more frequent, longer and intense floods and extensive droughts, which periodically affect some Basin communities as a consequence of the El Nino/La Nina phenomenon, with devastating social, economic and environmental effects. **d** and climate knowledge were identified resulting in limitations on efficiently modeling climatic variability and mitigating climate change effects.
- **Water quality degradation**, due to organic and chemical contaminants coming from mining and industrial activities, and the increasing urban sewage water discharges and diffuse contamination mainly from agriculture activities with intensive agrochemical use. Current development trends show an increasing pressure over the natural resources hence the need for improved water quality monitoring systems.
- **Sedimentation** affects navigable waterways and harbors, dams and reservoirs, degrades water quality, and leads to high maintenance costs. Sedimentation, arising from increasing human-induced erosion and from human-induced land degradation derived of land use changes and deforestation, threatens not only the human use of the waters of the La Plata Basin but also its ecosystems. An extensively study of the erosion vulnerability and sediment transportation in the La Plata Basin was prepared by the GEF Bermejo Project with basic information and an assessment to be shared at the basin-wide scale.
- **Biodiversity alteration**, in particular in fluvial and coastal ecosystems including wetlands, results from habitat loss and fragmentation. In part, these alterations reflect human interferences in the hydro-basin as well as longer-term and larger-scale climatic variations that affect the Basin.
- **Unsustainable management of fisheries resources**, due to overexploitation or lack of measures to limit incidental catches of non-target species, has important ecological and economic consequences for the River and for the indigenous settlements and poorer (disadvantaged) populations that depend on these resources for subsistence and livelihoods.
- **Unsustainable management of aquifers** in critical recharge and discharge zones has the potential to modify base flows in the River, and create further ecological modifications affecting human and natural uses of the aquatic systems of the La Plata Basin. Unsustainable abstraction of groundwater, the salinization and contamination of groundwater resources can have similar impacts throughout the Basin, especially in the semi-arid *Chaco* (Argentina, Bolivia, and Paraguay.)
- **Conflicts and environmental impacts derived from water use for crop irrigation** have wide ranging impacts on downstream human uses as well as ecosystem wide impacts. Without a shared vision, and the recognition of the La Plata Basin as a single hydrological resource, continued sector driven demands for water can impede the distribution and appreciation of the benefits to be derived from the system for humans and nature alike.

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<sup>2</sup> See details in Annex 3.

- **Lack of contingency plans to face disasters**, including hazards of anthropogenic origin such as those associated with dam safety, navigation, and the transportation of dangerous materials and contaminants as well as crises of natural origin such as floods and droughts, can exacerbate the consequences of such disasters on the human and ecosystem.
- **Unsafe water and environmental sanitation conditions** have effects on human and ecosystem health, produced as a result of contamination and deterioration of water quality. It is important to note the coincidence of urban development with insufficient sewage treatment and the increase in cyanobacteria, which can form toxic varieties. Cyanobacterial blooms are further aggravated by agricultural runoff, industrial discharges, and anthropogenic river flow modifications.

Underneath these risks, there are eight barriers or impediments to change what potentially limits the effective response to challenges by the Basin countries. The Macro-Transboundary Diagnostic Analysis, conducted during the PDF-B process, enabled the identification of the main barriers that should be addressed or mitigated, taking into account the limited budget of national institutions and the need for a programmatic approach. These main factors and barriers identified in the Macro-Transboundary Diagnostic Analysis are:

- **Lack of framework plans to manage the diverse demands for shared resources** in the Basin is exacerbated by the fact that responsibility for various components of the system is distributed among different jurisdictions at the federal and unitarian countries, often generating conflicts due to limitations in coordination. Consequently several initiatives and projects—including GEF-IW projects—have been and are being executed without a Basin-wide Framework, and in turn allow for the creation and/or existence of territorially-based entities to address specific issues. Current national legislation and regional agreements at the LPB scale, do not consider the scientific linkages between climate, water and soil, which results in a poor understanding at the regional level of these linkages and a need for improved coordination.
- **Weak institutions** and low levels of support for assigned competencies limit agency and societal responses to the identified challenges. The CIC has a remarkable planning, management and coordination structure, as defined in the Treaty of the La Plata Basin, but it is limited by its weak technical attributes. The new statute (2002) affirmed both the institutional and technical role of the CIC in the Basin, and strengthened the countries' command over the decisions of CIC. However, the national organizations working on issues of common concern focus on national priorities, and have not used the CIC to its fullest potential to address those concerns of transboundary nature. This limits the ability of the CIC to develop and transfer knowledge within the Basin. Further, some asymmetries were identified in implementing an integrated management policy within the Basin and a holistic approach, due to the diversity of national objectives and the differing legal and institutional frameworks of the Basin countries. Consequently, management actions to address critical issues or sub basins occur without coordination. Project teams have little interaction, resulting in duplication of efforts and inefficiencies. Lack of organized stakeholder participation to support sustainable water resources management is a common feature in the five countries. A Basin information network is being constructed by the CIC Secretariat, using in part GEF-Block B funds and counterpart contributions from FONPLATA and CONICET (Argentina), but by itself, it is not the answer to the institutional weaknesses inherent to the Basin.
- **Lack of an integrated water resources management vision** reinforces sector biases, and limited information from existing meteorological stations in key regions of the Basin restricts awareness of connectivity in the waters of the La Plata Basin. A joint groundwater and surface water resource management strategy is needed to resolve development issues in critical (drought prone areas) zones with low water availability, at risk from diminishing availability of water due to climate change and variability. The protection and management of aquifers in the five countries is especially weak and disconnected from the protections offered to surface water resources. In this regard, GEF support for the strategic management of the Guarani Aquifer System is facilitating a very interesting first experience in conjunctive management of linked surface and groundwater resources in the Basin.

#### Statement of Issue

The LPB is composed of five countries under various political and administrative structures and with distinct institutional development and significant imbalances in their technical capacities for the understanding and management of natural resources, water and climate. While Argentina and Brazil have a federal structure,

Bolivia, Paraguay and Uruguay are non-federal or unitarian countries. This difference creates an additional complexity for the LPB. For the LPB this difference adds an additional complexity to the already notorious asymmetries specially regarding capacities among the larger federal countries and the smaller unitarian countries. Also, the legal frameworks of the two federal countries, Argentina and Brazil, show certain contradictions. For instance, in Argentina, ownership over natural resources, including water originates in the provinces and those who serve as the legitimate representatives thereof while in Brazil, rivers found on the borders of states are managed by the Federal Government while States maintain responsibility to manage the water resources of internal rivers and groundwater. Twelve Argentine provinces and nine Brazilian states are a part of the LPB. In both federal countries, the institutional development of the IWRM has emerged in different ways and scenarios. This reality increases the institutional segmentation within the management of the natural resources of the LPB, with water and climate institutions and related services, incapable of interacting with one another, across different levels and jurisdictions.

To the nine major transboundary problems identified in the Macro TDA of the LPB are added the threats:

- Increasing conflicts in the use of transboundary resources, pressure generated by advancing urban development and industrial and agricultural enterprises, in the absence or weakness of legal and institutional underpinnings, technical-institutional capacity and instruments of joint management, and,
- The increased vulnerability of the region to the impacts of climate change, added to the disasters generated by floods and droughts that have traditionally affected the LPB.

Strengthening, and in some cases developing laws and institutions according to the shared vision of the five countries with different levels of performance within the basin is a task that requires perseverance. Facilitating the interrelation between the basin' institutions is essential to increase attention for the identified cross-border problems.

The priority that the countries have given to the themes of water and climate and to their integral relationship with the environment has yielded substantial efforts in legislation and in institutional developments within each of the five countries. Among those the following are highlighted:

- Argentina. Creation of the Federal Water Council and approval of the Common Principles of Water Policies, as a means to advance federal legislation for the management of water resources. Preparation of the National Plan of Water Resources with federal and provincial participation.
- Bolivia. Creation of the Department of Water and the General Directorate of Basins there within. Affirmation of the property rights of the native communities over natural resources including water.
- Brazil. Implementation of Law 9.433 for the Management of Water Resources, creation of the National Agency of Water (ANA), preparation and approval of the National Plan of Water Resources and advances in legislation and institutional development in various States.
- Paraguay. Creation, at a ministerial level, the Office of the Executive Secretary of the Environment (SEAM) and the Directorate for the Protection and Conservation of Water Resources there within. 2007 approval of the General Water Law, prompting the IWRM.
- Uruguay. Inclusion of the concept of IWRM and of the human right of access to water in the National Constitution, through a national plebiscite and the creation of the National Directorate of Water and Sanitation (DINASA), within the framework of the Department of the Environment and Housing (MVOTMA).

These major national efforts have been accompanied by important regional initiatives that have been made largely within two judicial-institutional frameworks:

- Within the framework of MERCOSUR, with the creation and operation of Sub-Group VI focusing on environment, progress has been made in analyzing the conceptual basis and the legal principles for water resource management.
- In the context of the CIC, the need for technical management capacity in the La Plata Basin was addressed by a Meeting of Foreign Affairs Ministers in December 2001 Montevideo. This meeting authorized the appointment of a second, technical representative to the CIC by each Basin country, in addition to the then existing political representative. This was the agreement for the creation of the Project Unit of the La Plata Basin within the CIC. This Project Unit completed an **Action Plan**, adopted by the CIC during 2003 that formed the basis for the preparation of the Framework

Strategic Action Program (FSAP). The FSAP includes a common Basin vision guiding the development of short term (5 years), medium term (10 years) and long term (more than 15 years) development scenarios.

The CIC is the designated regional institution acting jointly with the member States to integrate themes concerning IWRM and relating to the effects of climate change in the LPB. The CIC was recognized by the LPB Treaty as the permanent Basin organization “*in charge of the promotion, coordination, and follow up of multinational integrating development programs in the La Plata Basin, with the technical and financing assistance of international agencies and to execute the decisions approved the Ministries of Foreign Affairs.*” Within the Treaty, a series of complementary agreements created different specialized bodies that have been designed with specific competencies in the Basin, including FONPLATA, a financing agency, and the Intergovernmental Committee for the Paraguay-Parana Waterway (CIH), an inter-modal transportation agency; technical entities, including the Unit for Projects; the CIC Commission with its political and technical representation; and the Office of the Secretary General. The Treaty also allows for independent bi-national or tri-national agreements to focus on specific issues, creating numerous other organizations and programs.

Despite the strengthening of the technical organizational capacity of the CIC through the creation of the Project Unit, this Group of representatives is working from the national institutions and in sporadic joint meetings. In order to carry out its responsibilities in coordination, planning and information exchange, the CIC should strengthen the technical capacity within the office of the Secretary General. To advance towards the sustainable management of the Basin and a holistic approach that enables addressing transboundary issues effectively the CIC must act through common planning and action within a framework of regional cooperation among the five countries.

The Project, through its Component I, Sub-Component I.1 covers the incremental activities that make possible the process of strengthening the Office of the Secretary General of the CIC and the national offices involved in the system, to work in coordination, in a first phase of 5 years in the priority themes that they are of concern relating to: i). Technical institutional and capacity building; ii) Harmonization of conceptual, legal and institutional frameworks; iii) Decision Support System and, iv) Project Management.

### 2.2 Sub-Component objective:

The **objective** of Sub-component I.1 will be to mainstream the principles of integrated water resources management (IWRM) within the appropriate national and sub-national level institutions—including water resources, natural resources, economic development, climate, public health and sanitation, land use planning, fish and wildlife and agricultural agencies—through targeted institutional strengthening and capacity building, and harmonization of the legal and institutional frameworks within which the five Basin countries implement management measures. The execution of this Sub-project will support the arrangements needed for the execution of the Project at the country level, based in the creation of inter-ministerial bodies named, during the execution of the Project: National Projects Units (NPU), and to establish and/or strengthen the technical and legal conditions necessary to support the CIC and the participating country institutions and organizations in the integrated hydro-climate management, the formulation of the SAP and its subsequent implementation. Also these activities will be essential to strengthen capacities for management and information sharing in harmonizing the La Plata Basin legal framework for integrated water resources management, based upon plausible climate change scenarios, providing for coordination and oversight in Project Execution.

2.3 Environmental benefits: The major environmental benefits of Subcomponent I.1, relate to the ability of the LPB legal, institutional and technical frameworks to support interventions at different scales and jurisdictions and different stakeholders for the integrated and sustainable management of the systemic water and climate interrelations, conditioned by strong impacts in the short term (climate variability), and in the medium and long term, (climate change). Achieving improvements in the ability to predict and forecast climate scenarios will allow for a greater ability to adapt to climate change over time. The basin has additional pressures that will be addressed by this project Sub-component, such as the deterioration of forests and soils, the quality of water resources, and the fragmentation and destruction of the wetlands corridor and aquatic biodiversity. In this mega-basin the transboundary water resources interlink all this issues. The Project, under this group of selected activities looks to address the legal-institutional capacity in these interconnected areas to execute strategic

actions for protection and sustainable management of the LPB, in a programmatic way, with engagement of the strongest technical and political regional, national and sub-national institutions and social organizations.

2.4 Overall sub-project Outcomes: The **outcome** will contribute to institutionalizing the necessary legal and administrative tools, providing a support system for decision making regarding sustainable use of the land and water resources of the LPB, in scenarios of climate variability and change.

The Working Elements, Activities and Sub-activities to be carried out under this Sub-component will provide for coordination and project oversight capacity for planning and managing the other Components; will be housed within the CIC, with the National Project Units (NPU)—see Project Execution Organization chart providing coordination and oversight of project execution at the national level. Each NPU, acting, inter alia, as an inter-ministerial committee, will coordinate sectoral interests within their national territories.

2.5. Consistency of the Sub-component with national/regional priorities and plans:

The Project Unit of the CIC prepared a Plan of Action for the Sustainable Management of the La Plata Basin (Action Plan), which among other activities proposed a Basin Framework Program to promote and strengthen a common vision of sustainable development, and to define and agree upon a set of strategic actions to advance the construction of this common vision in the short, medium and long term. The Action Plan was prepared and adopted in 2003 at a meeting of the Permanent Representatives of the CIC. In it the five Governments declared a willingness to strengthen the legal and institutional framework for CIC action. It also identifies priority issues to be addressed, which were incorporated in the process of preparing the GEF Framework Program (the Project). Additionally the SG / CIC, in a meeting of Permanent Representatives, signed a Memorandum of Understanding with the Permanent Secretariat of MERCOSUR, in order to coordinate their efforts in the development of environmental policies and sustainable development in the region and in the LPB. For its part, FONPLATA, as the financial arm of the LPB Treaty to finance and promote its development, by resolution of its Board provided funding for the technical support of the General Secretariat of the CIC, with the aim of co-finance the GEF PDF B, for the preparation of the La Plata Basin Framework Program. FONPLATA also led the Project, and has shown interest and willingness to be an active participant and partner of the project, with input not only in the form of financial technical cooperation, but also through bringing its own technical capacity to participate in the process of co-implementing the Pilot Projects activities included in the Framework Program, with GEF funding.

2.6 Consistency of the Sub-component with the GEF strategies and its strategic programs: Sub-component I.1 will strengthen the institutional and legal and technical harmonization, to support the five countries of the LPB in their ability to prevent and resolve existing and potential conflicts generated by the different uses of transboundary water resources. With this approach the Sub-component constitutes a coherent set of actions that help to frame the Project within the Strategic Program 3 of the GEF (*Balancing overuse and conflicting uses of water resources in surface and groundwater basins that are transboundary in nature*). It particularly promotes mainstreaming and institutional strengthening as well as the meaningful engagement of civil society organizations in the responsibilities of managing water and other natural resources. The Sub-component promotes the dissemination of information and education concerning responsible management of these resources within an integrated and ecosystem-based approach that benefits to all users of natural resources and promotes cross-border cooperation between the various actors within the Basin.

2.7. Coordination and linkages to the umbrella project activities and other related activities in the basin: The Sub-component "Harmonizing the Institutional and legal framework" is a central part of the Component for the "Strengthening of basin-wide cooperation" within the LPB. The subcomponent focuses upon the institutional and legal foundations of the CIC in order to move towards the goal of developing the Project. The CIC was created as the permanent Basin organization "*in charge of the promotion, coordination, and follow up of multinational integrating development programs in the La Plata Basin, with the technical and financing assistance of international agencies and to execute the decisions approved the Ministries of Foreign Affairs.*" The Committee acts within the legal framework defined in the "Treaty of the La Plata Basin" signed by the five countries, through three instruments: the Meeting of Foreign Affairs Ministers of the Countries of the LPB, its highest organ, the General Secretariat of the CIC, based in Buenos Aires, Argentina, and through the Projects Unit, its technical team. The system is supported by the National Technical Counterparts, which link the action programs with their corresponding national or sub-national implementation/management counterpart. The Project recognizes and strengthens the role of the CIC and its ability to act under the countries mandates at different levels. The Sub-component I.1 implements a series of essential activities that will enable the CIC to develop the ability to

coordinate the management of sustainable development within the LPB, and its harmonic execution "as a part of" and "among" the five countries of which it is composed. The Project has been conceived within this institutional structure, so that its own performance is in itself an essential element of strengthening the basin-wide as well as the national and sub-national institutions, in their different levels and areas of activity within regional. The Sub-component includes arrangements for the direct implementation of the project, coordination with the co-financing institutions, development of priority activities and pilot/demonstration projects, as well as the preparation of the TDA and SAP.

## 2.8 Incremental reasoning:

*Baseline.* The LPB is a dynamic and complex region, located at the epicenter of deep changes since the creation of MERCOSUR including increased openness to global trade among the member countries. These changes have impacted and continue to cause significant pressure in land use, water bodies, ecosystems and forests, agricultural production, urbanization and population density, as well as industrial and mining development, causing environmental impacts that occur primarily in the areas of synergy of the different cumulative effects. The Macro-Transboundary Diagnostic Analysis identified nine risks facing the countries and communities of the La Plata Basin named as: 1) extreme hydrologic events linked to climate variability and change; 2) water quality degradation; 3) sedimentation affecting navigable waterways, harbors and reservoirs; 4) biodiversity alteration in fluvial and coastal ecosystems including wetlands; 5) unsustainable management of fisheries resources; 6) unsustainable management of aquifers; 7) conflicts and environmental impacts generated by water use for irrigated crops; 8) lack of contingency plans to face disasters, and 9) unsafe water and environmental sanitation conditions. Underlying these risks, are eight barriers or impediments to change that potentially limit the effective response to these challenges by the Basin countries.

The following main barriers identified during the MTDA will be addressed by this Sub-component I.1 and refers to:

- Legal frameworks, based in different principles to manage the transboundary resources of the Basin. This factor is exacerbated by the fact that responsibility for various components of the system are distributed among different jurisdictions and structures in the federal and unitarian countries, and coordination is required. Consequently several initiatives and projects—including GEF-IW projects—have been and are being executed without a Basin-wide Framework, and in turn allow for the creation and/or existence of territorially-based entities to address specific issues. Current national legislation and regional agreements at the LPB scale, do not consider the scientific linkages between climate, water and soil, which results in a poor understanding at the regional level of these linkages and a need for improved coordination..
- **Weak institutions** and low levels of support for assigned competencies limit agency and societal responses to the identified challenges. The CIC has a remarkable planning, management and coordination structure, as defined in the Treaty of the La Plata Basin, but it is limited by its weak technical attributes. The new statute (2002) affirmed both the institutional and technical role of the CIC in the Basin, and strengthened the countries' command over the decisions of CIC. However, the national organizations working on issues of common concern focus on national priorities, and have not used the CIC to its fullest potential to address those concerns of transboundary nature. This limits the ability of the CIC to develop and transfer knowledge within the Basin. Further, some asymmetries were identified in implementing an integrated management policy within the Basin and a holistic approach, due to the diversity of national objectives and the differing legal and institutional frameworks of the Basin countries. Consequently, management actions to address critical issues or sub basins occur without coordination. Project teams have little interaction, resulting in duplication of efforts and inefficiencies. Lack of organized stakeholder participation to support sustainable water resources management is a common feature in the five countries. A Basin information network is being constructed by the CIC Secretariat, using in part GEF-Block B funds and counterpart contributions from FONPLATA and CONICET (Argentina), but by itself, it is not the answer to the institutional weaknesses inherent to the Basin.
- **Lack of an integrated water resources management vision** reinforces sector biases, and limited information from existing meteorological stations in key regions of the Basin restricts awareness of connectivity in the waters of the La Plata Basin. A joint groundwater and surface water resource



management strategy is needed to resolve development issues in critical (drought prone areas) zones with low water availability, at risk from diminishing availability of water due to climate change and variability. The protection and management of aquifers in the five countries is especially weak and disconnected from the protections offered to surface water resources. In this regard, GEF support for the strategic management of the Guarani Aquifer System is facilitating a very interesting first experience in conjunctive management of linked surface and groundwater resources in the Basin.

*Increment.* Subcomponent I.1 provides a set of incremental efforts to strengthen the institutional capacity to coordinate the sustainable management of the development of LPB and generates agreements to improve the harmonious management of the countries on transboundary issues of regional and global importance. The Subcomponent stresses four main areas in which each country cannot act independently to obtain regional and global environmental benefits:

- mainstreaming and deepening the legal basis with regard to unified and integrated approach to the management of water, soil and climate, with an ecosystem based approach;
- institutional coordination for sustainable management among the 5 countries in the LPB and the strengthening of its technical and management capacity;
- The interactive meaningful inclusion of institutional stakeholders and civil society organizations concerned with the Basin in decision-making and action in the territory.
- The articulation, integration, processing and the ability to analyze information within the Basin, and dissemination of information for safe and responsible decision-making.

*Alternative.* Failure to execute the project, the current scenario is that of 5 countries acting in their national and sub-national territories using differing legal principles and foundations with different instruments and institutions with uneven capacities acting in a disorganized and fragmented manner, taking action in through various bi-national or tri-national commissions focusing upon sub-basins or bodies of water, independent from each other. These committees in turn generate projects in critical areas, many of them funded by the GEF which have generally been successful, but which are characterized by repeated and overlapping efforts. There is overlap and repetition in the development of management policies and public participation, in the development of the legal basis or through generating knowledge and environmental education programs in uncoordinated efforts. At the same time the fragmented approach results in the inability to act on broader issues such as the problems of hydroclimatic system within the macro hydrographic basin. However, the status quo of isolated and uncoordinated national management has been eliminated in the region with the creation and consolidation of the Southern Common Market (MERCOSUR), within which Sub-Group # 6, has been assigned the task of coordinating environmental policies in the region. Within Sub-Group # 6, four of the countries of the La Plata Basin are full members: Argentina, Brazil, Paraguay and Uruguay, while Bolivia participates as a partner country. As its objectives, MERCOSUR seeks improvement in the coordination of environmental policies, primarily related to the liberalization of regional trade, but it has expanded its goals to achieving a broader, more comprehensive regional integration. With the objective to strengthen the working relations and to improve the inclusion of water, land and climate sustainable policies for the LPB, the CIC, supported technically by the Project activities and working tools, will strength working relations with the MERCOSUR system for a more strong coordination with its environmental bodies, Sub-Group # 6 and the Ad-hoc Committees dealing environmental issues and natural resources, under the existing signed Agreement between the two institutions.

**Responsible institutions:** The activities will be carried out by the CIC's General Secretariat, in cooperation and association with National Executing Agencies, the federal and state agencies of the governments of the participating countries: Argentina, Subsecretaría de Recursos Hídricos, Secretaría de Ambiente, and Provincial water and environmental agencies, and CONICET. In Bolivia: Ministerio del Agua and the Servicio Nacional de Meteorología e Hidrología. In Brazil: the Secretaría de Recursos Hídricos of the Ministerio de Medio Ambiente and Agencia Nacional del Agua. In Paraguay: the Secretaría del Ambiente and its Dirección General de Protección y Conservación de Recursos Hídricos. In Uruguay the Dirección Nacional de Hidrografía. of the Ministerio de Transporte y Obras Públicas, and the Dirección de Agua y Saneamiento of the Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente. The sectoral activities within Component I are included under the responsible institutions' respective institutional responsibilities included in the respective P s.

## 2.9 Work Elements – outputs – outcomes:

Sub-component Objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
Objective: Establish the technical and legal conditions necessary for providing the CIC and the participating national institutions and organizations with the capacity for integrated hydro-climate management in the La Plata basin (LPB) and for the formulation of the SAP, and its subsequent implementation	1. Institutional capacity building program	Baseline TDA identifies need to integrated management	75% of the capacity building program implemented	100% of the capacity building program implemented
	2. Conceptual legal framework	Five different country legislation related to IWRM	Common concepts, principles for transboundary IWRM identified	Five countries agree upon conceptual legal framework
	3. The LPB-DSS	Agreement for the creating a DSS with approval from the Gov. of the five countries	Water Resources Reference System and Digital Map 50% complete	Water Resources Reference System and Digital Map 100% complete
Outcome 1.1.1: Strengthened institutional capacities CIC, National coordinators, and Working Groups, increases the number and scope of coordinated agreements and collaborated actions identified SAP	Inter-ministerial planning mechanism established	0	100% planning mechanism established and operating	100% operating with internal national agreements to sustain future action in the LPB under CIC coordination
	Project Steering Committee established and # of meetings	CIC Project Group as a base for the Project Steering Committee	50% of the regular meetings	100% of the regular meetings planned
	Project Director	Steering Committee acknowledges need for Project Director	Project Director 100% operational	Project Director satisfactorily supervise project
	National Coordinators established in each country.	0	100% named and operating	National Coordinators manage the project in a satisfactory manner
	# of working groups for coordination of thematic issues	0	6 thematically organized working groups created and operating	4 new thematically organized working groups created and operating. Total of 10 working groups
Outcome 1.1.2: With informed capacity, riparians, through the CIC, agree to recommendations for compatible legal agreements that identify specific climate and water management actions for the LPB	Agreements at the basin-scale address key water/climate management actions	Working methodology for water quality monitoring agreed under the PDF B phase	Preliminary recommendations at the CIC for countries technical legal agreements related to protect water quality and for the creation of alert systems in the LPB.	Agreed upon recommendations for compatible legal agreements at the country levels
	Recommendations for legal harmonization for TDA & SAP	0	2 national and regional legal workshops implemented	legal recommendations identified and proposal prepared & included in the TDA and SAP
	# of Inter-institutional knowledge exchanges	0	7	15
Outcome 1.1.3: An agreed to operationalized multi-sectoral decision support system (DSS)	Agreement for the creating a DSS with approval from the Gov. of the five countries	Digital Map Approved by the CIC	Approval of the creation of the DSS in the CIC	First: Phase of the DSS of the LPB functioning in a network with the national institutions.
	DSS technical training operational	Office of the Digital Map established with equipment and	Equipment and programs installed for phase 1.	DSS functioning with assigned CIC assigned personnel.

Sub-component Objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
		CONICET-Arg personnel.		
	Contribution of information and cartography	Existing CIC national information and GEF Project basic digital maps (Guaraní & Alto Paraguay and FREPLATA)	Links with national water & climate information institutions established, & SG/CIC management capacity available. - Base map of the LPB produced	Documentary information and thematic maps of the LPB produced and accessible, with geo-referenced data in a SIG.

## Detailed Description of Work Element Activities

### Work Element I.1.1. Technical institutional and capacity building

**Objective:** Institutionalize legal, administrative and managerial tools, including a decision support system and public engagement, for sustainable utilization of the land and water resources of the LPB, within the context of climate variability and change.

**Outcome:** Strengthened institutional capacities of CIC, National coordinators, and Working Groups, increases the number and scope of coordinated agreements and collaborated actions identified SAP.

**Activities:** This Work Element will develop the organization and institutional capacity for the Project implementation, including the national arrangements for the creation of National Project Units (NPU) as inter-sectoral and inter-ministerial bodies in each one of the countries. Internal arrangements inside the countries, to include the active participation of the legal sub-national jurisdictions and institutions and the civil society organizations are expected as part of each country compromises and interest. The internal national organization and, if necessary, the sub-national arrangements for the Project implementation will be informed by each country delegation at the 1<sup>st</sup>. Steering Committee meeting of the Project. The Work Element objective will be accomplished by implementing the following four activities, with the detailed tasks as identified in the table below:

- a) Facilitate basin-wide cooperation for adaptive-IWRM
- b) Balance national capabilities for TDA and SAP preparation.
- c) Implement institutional capacity building program
- d) Organize inter-institutional knowledge exchange program

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output I.1.1 Strengthened institutional capacity for PLB-IWRM	Institutional capacity building program	Baseline TDA identifies need to integrated management	75% of the capacity building program implemented	100% of the capacity building program implemented
<b>a) Facilitate basin-wide cooperation for adaptive IWRM</b>				
1. Formalize Project implementation arrangements <sup>3</sup> Agreements signed between: UNEP-SG/OAS; ii) SG/OEA-SG/CIC; iii) SG/CIC-National Executing Agencies; iv) SG/CIC co-financing partner agencies. 5 National Project Coordinators selected and named by each participant Government			Mid-term: Four primary agreements agreed upon Five National Project Coordinators in place and managing NPU	
2. Integrate and operate the National Projects Units (NPU) to act, inter alia, as an inter-ministerial committee.			- NPUs capacity to coordinate sectoral interests within national jurisdictions and territories and	

<sup>3</sup> This was in the right hand column: - Strengthen in his role of the CIC to coordinate and manage IWR & climate management under the LPB Treaty legal framework.

- A stronger CIC as the permanent LPB organization system to promote, coordinate and follow up on transboundary water resources management actions and to harmonized sustainable development, as established in the Treaty of the La Plata Basin and its associated statutes

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<ul style="list-style-type: none"> <li>5 NPU officially established, including institutions responsible for: water, land, climate and biodiversity management, working in agreement with academic and civil society organizations.</li> </ul>				within the LPB for transboundary issues, under the CIC coordination.
3. Create the Project Technical Unit at the CIC and country levels. <ul style="list-style-type: none"> <li>Call to cover positions for: Technical Coordinator, Technical Assistant, IWRM-climate specialist; secretarial and administrative personnel, to initiate the implementation of the Project.</li> <li>Working Group established to select the Project Technical Unit personnel, including CIC, UNEP and OAS participants.</li> <li>Selection and approval of the Project personnel</li> </ul>				- Intersectoral technical capacity established at the CIC and national executing institutions to coordinate and manage transboundary issues of common interest for the LPB countries, via the Project implementation.
4. Prepare the Project Plan of Operation (POA) including detailed arrangements for public participation, institutional strengthening and water & climate related activities, in coordination with the national institutions and organizations. <ul style="list-style-type: none"> <li>POA prepared including detailed plans of implementation for public participation, institutional arrangements and water &amp; climate capacity building.</li> </ul>				- Capacity for planning the implementation of activities at the LPB scale and sub-national jurisdictions.
5. First Project Steering Committee (PSC) meeting <ul style="list-style-type: none"> <li>General POA and particular detailed plans approved</li> <li>PNU confirmed</li> <li>PSC By-laws approved</li> </ul>				- Managerial capacity and rules in place at the SG/CIC to start the Project implementation strengthening of the CIC
6. Integration of thematic working groups as technical CIC counterparts. <ul style="list-style-type: none"> <li>Thematic working groups integrated at the CIC for: information, water &amp; climate, biodiversity, land use, ground water, and others.</li> </ul>				- Stronger institutional organization and thematic capacity to work in critical themes identified in an integrated way and with a programmatic approach.
<b>b) Balancing national capabilities for TDA and SAP preparation.</b>				
1. Institutional assessment of the country institutions weakness and fortresses & design of the Horizontal Cooperation Plan (HCP). <ul style="list-style-type: none"> <li>Consultant hired and HCP Plan designed</li> <li>Institutional Workshop to discuss a three years Plan and agreements to implement it.</li> </ul>				<ul style="list-style-type: none"> <li>Identification and assessment of the institutional weakness and fortresses for IWRM and to strengthen climate change resilience in the LPB</li> <li>Technical capacity to assess institutional development in areas of LPB interest.</li> <li>Agreements and arrangements to implement the HCP</li> </ul>
2. HCP for 36 months/specialist implemented during 3 years.				<ul style="list-style-type: none"> <li>Personnel among the participating countries and institutions trained. Technical institutional capabilities for IWRM and to strengthen climate change resilience in the LPB balanced between the 5 countries.</li> <li>Better knowledge and working relations between institutions and managers dealing with transboundary issues in LPB.</li> </ul>
<b>c) Implement Institutional Capacity Building Program</b>				
c) Implement Institutional Capacity Building Program				
1. The Project Technical Coordinator, with assistance of the TU of the Project and, in coordination with the NCs, prepares a Plan for training courses to assure the institutional and organizational capacity for Project Implementation. Manuals will be prepared and print to support the courses.				- Plan for training personnel involved in the IWR and Climate management prepared covering transboundary themes to be addressed with strategic actions agreed.
2. Training courses <sup>4</sup> implemented in each participant country. NPU, academic and CSO personnel trained for the Project implementation. An average of 30 persons trained in each country, depending on its dimension and structure.				- Technical and managerial capacity in place with adequate knowledge of the themes and objectives of the countries in the Project implementation and how to implement the activities including LPB stakeholders
<b>d) Organize a Inter-institutional Knowledge Exchange Program</b>				
d) Organize a Inter-institutional Knowledge Exchange Program				
1. The Project Technical Coordinator, with assistance of TU of the Project, and in coordination with the NCs, prepare the Rules and TORs for a first call for Inter-institutional knowledge exchanges in the 5 countries and prepare a Plan for the 5 years work.				- More balanced national capacity for IWR and Climate management, between participant countries and institutions at the LPB scale.

- <sup>4</sup> Courses are budgeted as national's courses. To promote the knowledge between the countries participants, a total of four posts will be open to the others participant's countries.

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
2. 540-months of Inter-institutional knowledge exchanges organized for the 5 countries to build IWR/Climate management capacity at the national level, following and in collaboration with the Project implementation.				- Strongest national institutions with a group of young professionals to execute the IWR and Climate management.
3. 15 young professionals trained in the day-to-day Project implementation with a transboundary basin-wide perspective. Each country will be enrich and equipped during a total of 36 months as follow: Argentina 2 persons; Bolivia 4; Brazil 2; Paraguay 4, and Uruguay 3.				- Young professionals trained in the executing IWR and climate management activities with a basin wide perspective in the LPB.

### Work Element I.1.2. Harmonization of legal frameworks.

**Objective:** Identify the differences and common principles and concepts in the legal framework of LPB countries and provide recommendations to ensure consistent application of environmentally sustainable measures throughout the basin, particularly for topics related with transboundary issues, as identified during the preparation of the baseline TDA.

**Outcome:** With informed capacity, riparians, through the CIC, agree to recommendations for compatible legal agreements that identify specific climate and water management actions for the LPB

**Activities:** This Work Element is comprised of two activities that will identify common principles of water law and draft proposals for key elements of a harmonized conceptual, legal and institutional framework for the sustainable management of water resources in the La Plata basin:

- a) Compile and prepare an adaptive-transboundary IWRM Conceptual Legal Framework
- b) Agree to and adopt the Conceptual Legal Framework

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output I.1.2 Conceptual Legal Framework	Conceptual legal framework	Five different country legislation related to IWRM	Common concepts, principles for transboundary IWRM identified	Five countries agree upon conceptual legal framework
<b>a) Compile and prepare an adaptive-transboundary IWRM Conceptual Legal Framework</b>				
1. Contract with a water & climate related Legal Consultant. <ul style="list-style-type: none"> <li>• Basic methodological framework document for the legal national reports preparation</li> <li>• Report with identification and systematization of common principles and concepts, related with IWR &amp; climate management issues in the legislation and institutional structures of the 'PB' countries</li> </ul>			<ul style="list-style-type: none"> <li>- Common concepts, principles, and technical background in specific legal thematic issues related with IWR/climate management in the LPB identified and legally assessed.</li> <li>- Legal strengthen of the integrated cultural, social, economical and environmental basin management, at the different jurisdictional levels in the LPB, under the CIC promotion and coordination, considering the long term goal of a harmonized and integrated resources management system in the la Plata basin.</li> </ul>	
2. Recompilation and integration of the documentation and main achievements and conclusions on legal aspects addressed by the GEF IW projects executed in the LPB (Bermejo, Pantanal, FREPLATA and Guarani)			- Integration & assessment of shared concerns related with water and climate management in the executed GEF IW projects inside the LPB.	
3. Consultant basic legal document prepared to be discuss during the legal workshop programmed <ul style="list-style-type: none"> <li>• Preparation of national reports with the legal national background in concrete themes of transboundary importance in the LPB</li> <li>• 5 country legal documents prepared by national entities</li> </ul>			<ul style="list-style-type: none"> <li>- Legal basis of the main transboundary waters &amp; climate problems in the LPB</li> <li>- National governments sharing legal basis, experiences and practices with focus in shared problems in the LPB.</li> <li>- Identification of the national regulations to manage water quality, indices and standards; legal bases for the climatic and hydrological alert system; and legal basis for disaster prevention and remediation in water bodies and the related ecosystems</li> </ul>	
<b>b) Agree on recommendations for conceptual legal framework</b>				
1. Discussion and integration of the legal national and consultant documents <ul style="list-style-type: none"> <li>• 5 national meetings implemented with national legal specialists on water &amp; climate aspects</li> </ul>			- ational's legal inputs and recommendations to address specific water & climate legal transboundary issues under the La Plata Treaty and the CIC	
2. International legal workshop			- Agreement in strategic legal actions for it	

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<ul style="list-style-type: none"> <li>20 legal and technical national participants, working during 3 days with the Consultant support as facilitator for legal discussions.</li> <li>2 documents reproduced and disseminated with conclusions and proposals to improve and enforce existing legal instruments.</li> </ul>			inclusion in the TDA and SAP, or to improve LPB countries capacity to work under agreements in transboundary themes as: water quality; hydrological and climatic alert and natural resources protection. - Proposals to harmonize the conceptual, legal and institutional framework necessary to carry out strategic actions addressing natural resources management	

Work Element I.1.3. Decision Support System (DSS)

**Objective:** Establish the groundwork to access, articulate, process, integrate information concerning the multi-sectoral issues in the basin, and make it available to the GS/CIC, in support of decision making for the integrated management of water resources, within the context of multi-sectoral issues, and climate variability. The specifics on the DSS approach and methodology are detailed in the Annex 4 to this sub-component document.

**Outcome:** An operationalized multi-sectoral decision support system (DSS)

**Activities:** The activities and tasks, as detailed in the table below, include:

- Coordinate and assess LPB national databases under institutional and legal agreements.
- Operationalize LPB-decision support system (LPB-DSS)
- Complete water resources uses and stakeholders reference system
- Compile digital map for LPB

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output I.1.3 DSS	The LPB-DSS	Agreement for the creating a DSS with approval from the Gov. of the five countries	Water Resources Reference System and Digital Map 50% complete	Water Resources Reference System and Digital Map 100% complete
<b>Activity a) Coordinate and assess LPB national databases under institutional and legal agreements</b>				
1. Initial Contract (12 weeks) with a specialist in Information Systems. <ul style="list-style-type: none"> <li>Initial Plan designed for 3 months. Implementation of the preparatory activities prior to coordination with the countries and the ICC, accompaniment, facilitation and management of activities.</li> </ul> 2. Creation by SG / CIC of a Working Group on Information and agreement by the TOR for a subcontract for establishing the SSD within the CIC framework. <ul style="list-style-type: none"> <li>Agreement of 5 governments designating coordinating institution for CIC Information for the Working Group (technical counterpart of the CIC).</li> <li>Meeting of the Working Group and definition of the TOR for the subcontract to establish the DSS, and inter-institutional protocols for the initial work. Agreement with ITAIPú Binational for free software design (Co-financing US\$ 90.000)</li> <li>Agreement on the system generating the database and the databases: hydrometeorological (quantity and quality); space, satellite imagery, document metadata, glossary of terms for managing water resources and climate; integration of the regional and global databases in the man of water and climate resources.</li> <li>Agreements on infrastructure for the management and storing of information (hardware).</li> </ul>			- Initial capacity for coordination and monitoring of national institutions managing information on LPB water resources and climate, as expressed in the formation of the Working Group on Information as the technical counterpart to the CIC.	
3. Inter-institutional coordination of the national database operators in the first phase of the DSS. <ul style="list-style-type: none"> <li>Definition and agreement on the structure and components of the databases for the DSS together with he project, incorporating the actions developed by the CIC digital map.</li> </ul>			- Structure of the databases Database, management, and information generation structure defined with endorsed agreements and connections with operating institutions within the national systems.	
4. Coordination and structuring of the DSS – Design of the plan to set up the DSS. <ul style="list-style-type: none"> <li>Plan to setup the DSS preparing and signing the inter-institutional protocols.</li> </ul>			- Formalization and official recognition of the DSS Setup Plan under the CIC framework.	

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Activity b) Operationalize LPB-decision support system (LPB-DSS)</b>				
b) Operationalize Decision Support System (DSS)				
<p>1. Definition of content and agreement on the protocols for the exchange of information and operation of the DSS to be agreed to by the CIC with national institutions responsible for the management of hydrometeorological information of the countries as well as other details of the DSS.</p> <ul style="list-style-type: none"> <li>• 3-day seminar – workshop with the participation of 2 specialists on information management for the national institutions of each country, definitions of protocols to be signed and the setup and operation of the DSS as well as other complementary agreements between the systems.</li> <li>• Signed protocols for the exchange of information between the countries and the DSS of the SG/CIC and for the set up and operation thereof.</li> </ul>			<p>- Definition of the contents of the agreements to be signed and the signature by the governments of the five countries and the SG/CIC for the setup of the LPB DSS.</p> <p>- Agreements on the concrete tasks to be run by the LPB DSS.</p>	
<p>2. Acquisition and implementation of hardware for the DSS, in agreement with the definitions of the seminar-workshop and the support of the information systems specialists.</p> <ul style="list-style-type: none"> <li>• Acquisition of the necessary information equipment by the SG/CIC</li> <li>• Acquisition of the necessary information equipment to complement the national systems in their articulation to the SG/CIC for the DSS of the LPB.</li> </ul>			<p>- Information equipment available in to the SG/CIC capable of interconnecting the network of decentralized information systems of the 5 countries and with the capability to manage its own data as well as the data generated by the project</p> <p>- National system working together in a complementary way in the DSS together with the CIC.</p>	
<p>3. Implementation of the System Generator of the databases of the DSS. Two options are proposed for consideration: (i) using Linux / Oracle (full version for LINUX) free use available on the Internet, requiring training costs of (ii) use of Windows / SQL Server with costs associated with the purchase of a license.</p> <ul style="list-style-type: none"> <li>• System generator for the database selected and implemented.</li> </ul>			<p>- Ability to implement the operation of the articulated databases of the SG/CIC in connection with the national hydroclimatic information systems.</p>	
<p>4. Implementation of the Hydrological Database of DSS (quality and quantity), following the institutional arrangements established. System -Hidro Version 1.1 (Brazil) is suggested as an option to be considered, with free use for the basin, for the acquisition, storage and rendering of information in real time (on line) with a graphic interface, particularly for its hydrological warning systems. Translation of manuals would be required. Another option to be considered is the use of free software in the basin. Option 1: contract system analyst with experience in LINUX Training; Option 2: acquisition of a license.</p> <ul style="list-style-type: none"> <li>• Hydrological Database implemented, including information generated by this project and other GEF-IW projects executed in LPB and the Digital Map of the CIC.</li> <li>• implementation of the Database System Generator</li> <li>• Manuals translated into Spanish</li> </ul>			<p>- Ability to manage hydroclimatic information in an integrated manner in LPB, via a system using information from databases and metadata existing within the national institutions, created by the Framework Program for the other GEF-IW projects of LPB and the Digital Map Project of the CIC.</p>	
<p>5. Create, standardize and integrate the Spatial Database of the project and the LPB. The Bank shall:</p> <ul style="list-style-type: none"> <li>• Inform the mapping available on the ICC Digital Map and the other GEF projects in the LPB.</li> <li>• Give substance to the geo-referenced information developed in Project</li> <li>• Consider as an option the use of free software for satellite imaging CIBERS-Brazil and Landsat-USA, CONAE-Argentina, etc.. <ul style="list-style-type: none"> <li>○ Homogenized database working with SIG-based with regard to mapping and geo-referenced data.</li> <li>○ Software manuals translated and adapted when necessary.</li> <li>○ Spatial database with thematic mapping of the Project and satellite imagery.</li> <li>○ Training with input from specialists from research centers with expertise in the subject.</li> <li>○ Purchase of necessary software and hardware.</li> </ul> </li> </ul>			<p>-Socio-economic, hydro climatic information and the uses of water coherently integrated as they concern the LPB. Data organized and georeferenced and available for analysis and distribution.</p>	
<p>6. Provide consistency, homogeneity and integration to the documentary databases – Metadata bank:</p> <ul style="list-style-type: none"> <li>• Structure and organize information about existing documents and data (metadata) in the basin.</li> <li>• Include bilingual glossary of hydrological / water and climate resource</li> </ul>			<p>- Documentation and information generated by the Project and other projects and actors in the LPB available and accessible for institution and civil society organizations and to users of natural resources in the LPB.</p>	

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
management terms (Spanish and Portuguese)	<ul style="list-style-type: none"> <li>○ Metadata Bank structured and operable including documentary information provided by the Project, with access to the hydroclimatic glossary of terms in Spanish and Portuguese.</li> </ul>		- Ability to make CIC and Project information available on a website in order to prepare educational materials and the disseminate information about the LPB.	
7. Identification together with IW:LEARN and integration into the DSS of the "links" and global databases involved with management of water climate resources.	<ul style="list-style-type: none"> <li>● Identification together with the Inter-american Network of Water Resources/Southern Cone Node and Brazil (RIRH/OEA/UNESCO), if the contacts and sources of information and regional databases.</li> <li>○ Coordination of the DSS tasks with IW:LEARN and the RIRH integrating global and regional databases.</li> </ul>		- Incorporation of the CIC and its DSS into the regional and global networks of exchange and management of hydroclimatic information.	
Activity c) Complete water resources uses and stakeholders reference system				
1. Information gathering from existing databases and preparation of a georeferenced registry of major users of water within the LPB.	Compatible and georeferenced registry of the major users of water for the DSS of the CIC, including information taken from databases of the GEF IW projects such as Guarani, Bermejo and FREPLATA and the information taken from the UNESCO co-financed project on Water Balance in the LPB		- Availability of integrated, localized, and accessible information about the type and quantity of use of water in the LPB.	
Framework of integration of the databases of the major users of water with the Hydrological Database, with the support of a specialized consultant	Systems of availability and integrated demand in the DSS		- Integrated water balance of the LPB with information available and demand for water accessible to users and interested parties.	
d) Compile digital map for LPB				
<ul style="list-style-type: none"> <li>● Create and integrate thematic mapping of the LPB. <ul style="list-style-type: none"> <li>○ Availability of maps concerning: base map of the LPB; thematic layers related to infrastructure; population and social aspects; current hydrology and scenarios linked to climate variability and change in the LPB; integrated climate and hydro climate models and scenarios for the LPB; physical, environmental, social and economic vulnerability maps and maps of areas which are sensitive to variability and change climate; mapping of the risks of natural and manmade (spills and contaminants) disasters in the LPB; mapping of the areas of Pilot Projects.</li> </ul> </li> </ul>			Mapping of work, presentation of results, and models about the incidence of climate and hydrological variability and change and related to the vulnerability, sensitivity, and risks which face the LPB.	
<ul style="list-style-type: none"> <li>● Preparation of publications and communications and dissemination materials. <ul style="list-style-type: none"> <li>○ Technical documents and published maps and reproductions for dissemination.</li> </ul> </li> </ul>			- Ability, in conjunction with the CIC, to spread and support environmental education with didactic material concerning the LPB, its hydrology, vulnerability, its climate change and its capacity to adapt.	

## 2.10. Budget:

### Co-financing

Sources of Co-financing	Type of Co-financing	Amount
Project Government Contribution	In-kind	2,346,750
Bilateral Aid Agency(ies)	(select)	0
Multilateral Agency(ies)	In-kind	79,500
Private Sector	In-kind	534,600
NGO	(select)	0
Others	(select)	0
Total co-financing		2,960,850



Financial Table of the GEF Budget

Concept		Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200	Consultants						
	1.	60,000	30,000	30,000	30,000	30,000	180,000
	2.	28,000	42,000	42,000	14,000		126,000
	3.	16,800	16,800	16,800	16,800	16,800	84,000
	4.	21,000	14,000				35,000
	5.	6,000					6,000
	6.	6,000					6,000
	7.			12,000			12,000
	8.	16,800	16,800	16,800	16,800	16,800	84,000
							353,000
2200	Sub-contracts with institutions 1.Designing & DSS implementation 2. LPB base & thematic maps	329,880	130000	150000	150000	53576	813,456
3200	Workshop & training (including travels)	176,204	110,704	152,704	101,704	86,584	627,900
4100	Equipment & Supplies	50,000	14,500	3,500	3,500	3,500	75,000
5200	Publications and documents	0	0	26,300	20,300	42,300	88,900
<b>Total Cost US\$</b>		<b>651,184</b>	<b>344,804</b>	<b>420,104</b>	<b>323,104</b>	<b>219,560</b>	<b>1,958,756</b>

Consultants working for technical assistance components

Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
For Technical Assistance			
Local			
Consultant 1	1,250	144	LPFP Technical Coordination
Consultant 2	875	144	IWRM-climate change specialist
Consultant 3	350	240	Bilingual Secretary
Consultant 4	875	40	Water resources institutional specialist
Consultant 5	750	8	Horizontal cooperation plan design
Consultant 6	750	8	Capacity building & inter institutional plans design
Consultant 7	750	16	Water legal specialist
Consultant 8	350	240	DSS operation and information management

2.11 Timetable:

W.E./ ACTIV.	YEAR 1						YEAR 2						YEAR 3						YEAR 4						YEAR 5					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
I.1.1																														
A	•			•			•				•		•				•		•				•		•				•	
B																														
C																														
D																														
I.1.2.																														
A																														
B																														
I.1.3.																														
A																														



Risk	Rating (L/M/H)	Risk Mitigation Measures
Failure of the provincial or state governments to adopt and implement the SAP	M	Involvement of the appropriate governmental and nongovernmental stakeholders, and the development of inter-ministerial coordinating mechanisms addressing sectoral concerns
Exchange rates vis a vis the dollar	H	Out of project control, can be minimize by adding counterpart and co-financing
Geographic extent of the basin, which is a limitation to effective and efficient participation and the active involvement	L	Strong linkages with civil society, professional bodies, and relevant governmental bodies will minimize this risk
Lack of effective integration of co-financing	L	Formal agreements between responsible institutions and the CIC prior to the beginning of Project activities

**2.14 Sustainability:** The program has been conceived to be implemented over 15 years, in three successive 5-year stages. The baseline remains weak in view of the complexity of issues to be addressed and the dimensions of the basin, and this needs to be resolved. GEF support and other cooperation catalyzed toward the resolution of these concerns within the basin are likely to be a critical factor in the sustainability of this effort. With this perspective, efforts toward sustainability by the countries and the CIC are key factors in managing the project and have been integrated into the work methodology since the preparation of the FSAP. The financing ability of the member States has been a constant preoccupation of the CIC. For this reason the countries legal institutions form the basis for implementation of the Project as well as the most important objective for institutional strengthening to ensure sustainability.

The advance in the integrated sustainable management of the basin, within the framework of the CIC, will result in enhanced governance capabilities. Development of legal and institutional actions, as well as technical and operative potentials, to work within an integrated vision among the basin institutions responsible for various sectoral issues will facilitate development of effective economic instruments and a responsible climate for civil participation. This is the baseline upon which the future sustainability of the SAP is founded: relevant technical capacity, through inter-institutional knowledge-exchange program, with the goal to engage, educate, and inform within the participating institutions as a result of this Project. The Foreign Affairs Ministries and responsible institutions of the five countries will support the economic and financial structures of the actions to be executed under the project.

The Thematic Groups to be formed in each country by the National Coordination Units will act as Inter-ministerial Technical Committees to facilitate the integration and involvement of the different Ministries and governmental institutions. The civil organizations involved through the promotion of the active participation in the FSAP and its activities are key elements for the social sustainability.

**2.15 Replicability:** The results of the SAP formulation Phase (2007-2011) will be disseminated through government institutions, nongovernmental institutions, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including the institutions related thereto in each of the five countries, will permit the development of information transfer mechanisms, to ensure dissemination of new knowledge, active coordination and horizontal cooperation among countries and organizations involved in the integrated management of the water resources of the basin.

The outcomes and results of the pilot demonstration projects and priority projects will identify feasible and cost-effective interventions able to be replicated elsewhere in the basin. It is expected that representatives of the communities participating in the three priority projects and four pilot demonstration projects (Component II) to be executed with local communities will form a consultative committee able to assist other communities in replicating successful interventions, a consortium of expertise able to participate meaningfully in local decision making, and a case study in successful public-private partnership that could serve as the basis for "lessons learned" from this project to be highlighted through the IWRN and IW-LEARN networks.

Outside of the la Plata basin and within the region, the Project experience is to be transferred through the institutions related to natural resources management and, particularly, to water resources (such as the Inter-American Water Resources Dialogue process and the IWRN, as well as through the Foreign Affairs Ministries of the five countries). The CIC will be a key instrument in transferring that experience within the region, by signing cooperation agreements with other multinational basin institutions.

The integration of the Project information and communication system with other similar networks will constitute another important element in the dissemination and transfer of experience in order to replicate the institutional arrangements, sustainable practices, technologies and methodologies elsewhere in the basin and Region. Through the IWRN Net Nodes, and the Internet-based Information and Communication Systems to be developed under Component I, the results and products of this Project will be transferred to and through IW-LEARN for wider dissemination within and outside of the region.

**2.16 Execution arrangement:** The arrangements for the implementation of the SAP include the strengthening of the CIC, which according to the Treaty of the la Plata basin is the organization designated to “coordinate” the implementation of Basin-wide programs.

The arrangements for Project implementation (2008-2013) are based on those used during the PDF Block B phase see organizational chart below).

The **Steering Committee (SC)** will be established as the highest authority in the decision-making for the conduct of the Project. The SC will be responsible for implementation oversight and will decide on the yearly project work plan and budget in accordance with GEF approved project documentation. The SC will include (1) the CIC Political and Technical Representatives from each of the five riparian countries. Each country will also appoint (2) an additional technical officer to cover the various thematic issues of the project. Those 5 persons will also sit on the SC. Representation of the national environmental institutions will be secured through one of the two technical representatives. (3) A representative of UNEP, acting on behalf of the GEF Implementing Agency, and (4) a representative of the DSD/OAS, acting on behalf of the Executing Agency, will also be part of the SC. (5) A representative from the major co-financing institutions might be invited to participate as deemed necessary. The Secretary General of the CIC in its capacity of Project Director will chair the SC meetings. The Project Coordination Unit –PCU- will act as Secretary for the meetings. The United Nations Development Program (UNDP) and the World Bank could be invited in an *ex-officio* capacity.

The meetings of the SC will be preceded by a **coordination meeting** with the IA, EA, PCU and Project Director to review project progress and proposed corrective measures as appropriate, and to finalize the annual costed work plan for validation by the SC.

The **Project Coordinating Unit (PCU)** --staffed with GEF resources as per the budget in Annex 08--will under the leadership of the Project Director and in close consultation with UNEP and OAS and with the support of the National Project Unit – NPU, coordinate and supervise daily project operations; elaborating detailed terms of reference for project activities, reviewing progress and technical reports according to the overall work plan and its schedule of work, preparing overall progress and financial reports for submission to the IA/EA, preparing annual detailed costed work plan in accordance with the GEF approved project documentation and M&E plan. The PCU will specifically coordinate the formulation of the TDA and SAP.

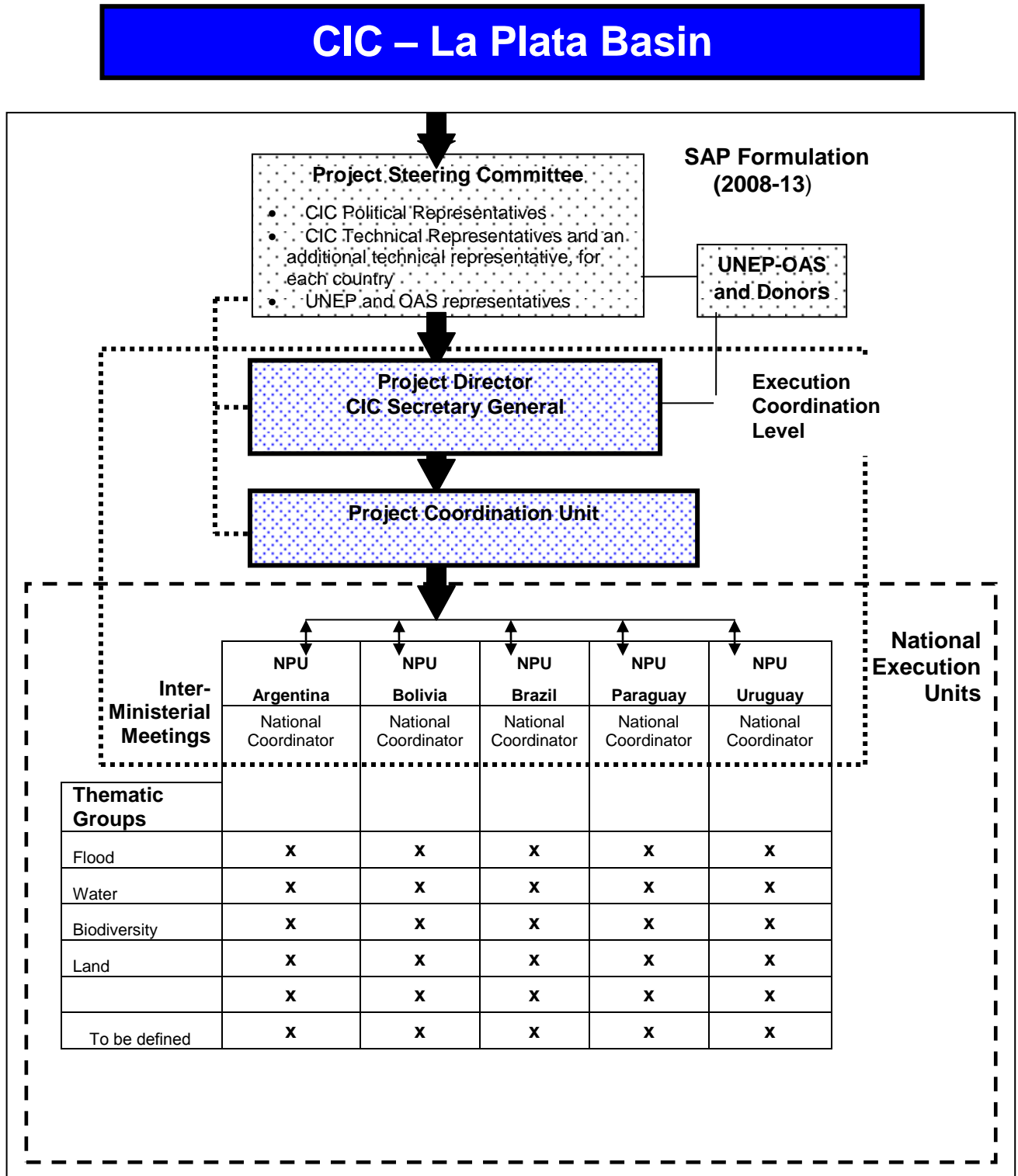
The SG/CIC will serve as **Project Director**.

The **local execution** of the project in each of the Basin countries will be done by national institutions under the coordination of the **National Project Units-NPUs**-. The NPUs will be led by a national technical representative who will serve as National Coordinator for the Project. The National Coordinators will convene and coordinate the meetings of the **Inter-ministerial Working Groups (IWGs)**, which are part of the NPUs. In addition, **Thematic Groups** have been established in each country for addressing specific and sectoral issues. These Thematic Groups in the five countries met during the PDF-B phase to coordinate actions of transboundary nature, included in the FSAP formulation. They will continue to meet as required and will be coordinated by the NPUs.

With the approval of the OAS and UNEP and in accordance with the GEF approved project, the Project will contract local experts.

The Secretary General of the CIC, as the Project Director, is co-responsible to the SC and CIC for the project implementation. In particular, he is responsible for the implementation of activities in Component I related to legal issues and the institutional strengthening of the CIC. UNEP and GS/OAS will support Project implementation. GS/OAS, due to its historic involvement in the basin, traditional partnership with UNEP in similar projects within the region, will act as Executing Agency consistent with UNEP requirements outlined in the UNEP-OAS signed agreement. UNEP as the GEF Implementing Agency will be responsible for overall project supervision to ensure consistency with GEF and UNEP policies and procedures, and will provide guidance on linkages with related UNEP and GEF-funded activities. The UNEP DGEF will monitor implementation of the activities undertaken during the implementation of the project and will be responsible for clearance and transmission of financial and progress reports to the Global Environment Facility. UNEP retains responsibility for review and approval of the substantive and technical reports produced in accordance with the schedule of work.

**Project Implementation Arrangement**



2.17 Public participation mechanisms: The FSAP, a product of the PDF-B activities, was prepared with the active involvement of responsible governmental institutions in each country, the academic sector, universities and investigatory centers, and civil society. During the preparation process, specialized personnel were present to actively and responsibly include civil organizations in the process. This participative dimension strengthens basin governance, and is present in each of the Components to be implemented during the project, in particular in Component I, which proposes a strategic program for stakeholder involvement and participation. Promoting public participation in this project is integral and transversal to the process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society—with special focus on gender equity and indigenous peoples. This involvement also will favor appropriations and the social sustainability of the SAP during both its formulation and implementation, consolidation of social capacity, generation of a basin consciousness, and appropriate and targeted informational and educational programming (see Subcomponent I.2).

2.18 M&E: The project will follow the standard UNEP procedures for Project Monitoring and Evaluation (administrative, technical and financial) which include quarterly and half-yearly progress reports; quarterly and annual statements of expenditures, including co-financing and counter-part contributions; a mid-term review (MTR); and a final evaluation. The MTR will be performed within the next quarter after project implementation had reached the mid-term; that is, between the 30th and the 33rd months of project implementation, regardless the level of implementation and disbursement. The final evaluation will take place once all funds have been disbursed and all activities completed.

In addition to Project Monitoring and Evaluation activities, the project will include activities aimed at assessing the effectiveness of the Framework Strategic Action Program (FSAP) implementation in achieving its goal. The purpose of this assessment is to identify corrective measures and/or changes in the FSAP in order to achieve more effectively and timely the Development Objective set forth by the participating countries, as agreed in the Vision for the la Plata basin, addressing the main transboundary issues and associated global benefits identified in the baseline-TDA.

The Project will further refine the Monitoring and Evaluation plan (Subcomponent I.3), supported in a M&E system based on the Logical Framework (included in Annex of Subcomponent II.3). This refined Plan will be formulated by the Project Technical Unit in close consultation with the CIC, OAS and UNEP and will be approved by the Steering Committee. The M&E system will make use the software developed by the Brazilian Water Agency in support of the GEF Sao Francisco and Upper Paraguay River basin and Pantanal projects. This software will permit evaluation of the fulfillment of the project milestones. The indicators will be useful tools for monitoring, and considered as a continuous evaluation process of Project advancement and achievements.

The M&E system will institutionally strengthen the different Executing Program Units, supplying auxiliary equipment to develop training and capacity building activities for the responsible personnel in collaboration with the National Technical Units. The software implementation together with training and capacity activities will ensure a feedback process for decision makers. In particular, the M&E system will enable the provision of an “early alert” of the need for project modification (adaptive management) and the rapid design of corrective measures.

The M&E system will interconnect the National Technical Units with the International Technical Coordinator of the Project and Executing and Implementing Agencies to interchange monitoring data on the components and replicable pilot demonstration projects. Dissemination of project progresses, results, best practices and experiences will be catalyzed by the strong public participation as per the public participation strategy as described in Subcomponent I.2, together with the activities undertaken under the “Public Participation Fund.”

## ANNEXES

### Annex 1: Map of La Plata basin





## Annex 2

### TERM OF REFERENCE

#### PROJECT TECHNICAL COORDINATOR

Sustainable Management of the Water Resources of the La Plata Basin, with Respect to the Effects of Climate Variability and Change

#### 1. Background

The overall project **objective** is to assist the riparian country governments of Argentina, Bolivia, Brazil, Paraguay, and Uruguay<sup>5</sup> in managing the shared water resources of the La Plata Basin (LPB) in an integrated sustainable manner within the context of climate variability and change while capitalizing on development opportunities. The project **outcome** is the riparian governments' ability to coordinate actions and investments in the LPB for sustainable utilization of its water resources within the context of climate variability and change. This basin-wide project provides context for, and linkages between, ongoing GEF-supported efforts within the LPB. This project promotes synergies between GEF focal areas, increasing the resilience and adaptive capacity of the Plata basin stakeholders in preparing a basin-wide structured menu of concerted adaptation measures in response to a vulnerability and adaptation assessment.

The purpose of this project is to enable the riparian governments and stakeholders to obtain the institutional and analytical tools to prepare the LPB TDA, and to formulate the SAP for adaptive and sustainable water resources management. The project **supports** formulating the Strategic Action Program (SAP) for the LPB, and creating the institutional and legal framework, and technical capacity for its implementation. The project builds on on-going projects and programs executed under the LPB Treaty coordinated by the Inter-governmental Committee for the LPB (CIC,) and by bi-national and tri-national committees created under the La Plata Treaty. The project **contributes** to a higher objective set forth by the five riparian, signatory countries to the LPB Treaty -Argentina, Bolivia, Brazil, Paraguay, and Uruguay - as coordination of actions and investment in the LPB for the sustainable integrated water resources management. The project **initiates** efforts on adaptation to the climate variability and climate change, with the ultimate goal of mitigating their negative impacts and capitalizing on the opportunities that they provide. Thus, through coordinated component activities, the project **introduces** adaptation to climate variability and change as a crosscutting issue, and mainstreams it throughout all anticipated basin projects and actions; and **promotes** an adaptive integrated water resources management (IWRM) process.

The project implementation will be the result of the programmed efforts of the water management institutions of the five riparian countries under the CIC coordination, with the financial support of the Global Environmental Facility (GEF) and other co-financing agencies, the United Nations Environmental Program (UNEP) as the GEF Implementing Agency and the Department of Sustainable Development of the Organization of the American States acting as executing agency.

#### 2. Objectives

The Project's Technical Coordinator (PTC) will be a high-level water management specialist tasked to coordinate technical implementation of the project activities, and to achieve the project objective in a technically consistent manner, with sound outcomes and outputs. Particularly the PTC, will be responsible to prepare the two main project's outputs the Transboundary Diagnostic Analysis (TDA) and the Strategic Action Program (SAP).

#### 3. Activities

To accomplish the objective of this contract, and working in close relations with the Project Director (Secretary General of the CIC) and the OAS International Manager – who are respectively responsible for the project implementation in the five riparian countries in the PTC will:

<sup>5</sup> The riparian governments operate within the framework of the Intergovernmental Coordinating Committee for the La Plata Basin countries (CIC), as the agreed intergovernmental organization set forth for this purpose in the Treaty of the La Plata Basin

- a) Ensure technically sound project implementation, based in the Project Document approved by UNEP and GEF as the basic guide, and taking into consideration the other financial institutions and basic documents included as co-financing partners and activities.
- b) Prepare, and actualize, on a yearly basis, the Project Work Program and consistent detailed project budget, to assure the adequate project activities.
- c) Implement the project's M E Plan.
- d) Ensure the technical capacity to manage the implementation of the project activities, supervising the reporting capacity of the project implementation and articulated outcomes.
- e) Maintain technical coordination of all project activities, with respect to the project's personnel at the Project Management Unit.
- f) Identify and prevent any possible technical problems during the project implementation, and take corrective actions.
- g) Assure the implementation of the Decision Support System (DSS) at the CIC as a mechanism to integrate and assess all the technical information recuperated and generated by the project, and to look for the adequate distribution of the information generated to the stakeholders and public in general.
- h) Permanently be aware of the need to promote and to integrate to the project activities, as defined in the Project Document, the civil society organizations, to assure the active involvement of the different stakeholders during the project implementation and for its sustainable participation at the CIC.
- i) Revise, evaluate, and inform over the technical documents prepared and work executed by the Project Technical Unit, consultants and subcontracts included in the Project Activities.
- j) Inform the Nationals Coordinators of the project activities and results in a fluent manner.
- k) Travel to the countries inside the LPB and outside if needed, for the technical and follow up activities of the Project as needed and when the Director of the Project or the International Manager of the project request
- l) Assist in the preparation of term of references, contracts and bidding documents needed for the project implementation.
- m) Assist in preparing the quarterly, half year, yearly and any other technical report, in the format required by UNEP and GEF.
- n) Organize the technical and participatory process and prepare the Transboundary Diagnostic Analysis and the Strategic Action Program as the final documents and main outputs of the Project in a consistent way.
- o) Organize and call the meetings of the Project Coordinating Unit and participate in the technical working relations with the Nationals Coordinators for project implementation.
- p) Act as Technical Secretary for the Project Steering Committee meetings, and prepare the minutes for approval.
- q) Request payments for the Project implementation as needed.

#### 4. Requirements for the position

The PTC will have the following requirements:

- a) A resident of the La Plata Basin
- b) A water specialist,
- c) PHD or Master degree in water resources, and/or water engineering
- d) A minimum of 10 years of experience in technical coordination of project implementation, in particular related with integrated and complex environmental projects.
- e) Fluent in Spanish or Portuguese, and English speaking and writing skills,
- f) Knowledgeable in GEF system will be recognized as an important background for the post.

The PTC will work at the CIC office at Buenos Aires, Argentina as a full time specialist for the project implementation.

### Annex 3: Terms of Reference for consultants

#### Consultant 1

##### Objective:

Technical International Coordination

##### Activities:

During the contract, the consultant will conduct all activities necessary to establish and execute the program on time and carry out the activities planned. In particular, in constant agreement with the Secretary General of the CIC (GS / CIC). The consultant shall:

- Along with the GS / CIC establish the infrastructure and working arrangements for implementing the Program.
- Coordinate and lead management technical support for the GS / CIC of the activities required by the implementation of the program and ensure consistency of technical work to be carried out. Analyzing the background: the Treaty of the La Plata basin, the CIC and the Program, in order to better do his/her work. The consultant will place particular emphasis on the Project Document approved by the GEF at the initiative of the basin countries and the CCC, and in the Plan of Implementation of the Program (PEP), which will guide the implementation of its activities.
- Preparation of the Annual Plans of Operation including detailed arrangements for public participation, institutional strengthening and water & climate related activities, in coordination with the national institutions and organizations.
- Annual Plans of Operation prepared including detailed plans of implementation for public participation, institutional arrangements and water & climate capacity building.
- Integration of thematic working groups as technical counterparts to the CIC.
- Prepare and present, in the time and manner required, Annual Operation Plans for the approval of the Council Director, and send them at least 15 days in advance of the relevant meetings. Produce an appropriate output of work in implementing the program and maintain communications at different levels and with different actors involved, following objective. Ensure the expected participatory process to maintain a smooth and efficient communication with the implementing agencies nationals, with other donors and executing agencies and the GEF projects in operation in the La Plata basin.
- Supporting the GS / CIC in the coordination and integration of other initiatives that are being implemented or planned in the basin or in their areas of critical interest.
- Maintain support and coordinate program activities with the activities of the CIC and other projects. Identify, maintain and support the efforts of the SG / CIC to incorporate other actors and involve them in the funding and technical development of the Program.
- Organize meetings, workshops and seminars planned or deemed necessary during the implementation of the Program.
- Conducting requests for quotes, offers and, in accordance with the Program Manager, manage the purchases involved in the normal operation of the Program, within the budgets available.
- Prepare and present proposals for adjustments to the budgets of the Program in conjunction with the Program Manager and OAS, for consideration by the Council Director.
- Define the scope of work of the different activities and prepare the Terms of Reference of consultations during this period provided at the necessary time.
- Participate in preparing the processes and documents for the selection of consultants and present them to the SG / CIC.
- Prepare (in required GS / OAS formats) requests for contracts and disbursements brought to the UDSMA for processing in the time and manner required.
- Develop quarterly, semiannual and annual reports to be submitted to the Board Director, the GS / CIC and the OEA, following the formats required by UNEP.
- Participate in meetings of the Council Director and maintain notes of the meetings.
- Orient the consultants work in the preparation of technical documents and outputs in the Program of Strategic Actions (SAP).
- With assistance of the Technical Unit of the Project and, in coordination with the NCs, prepare a plan for training courses to assure institutional and organizational capacity for Project Implementation.

Prepare manuals and deliver them to support the courses.

- With assistance of the Technical Unit of the Project, and in coordination with the NCs, prepare the Rules and TORs for a first round of Inter-institutional knowledge exchanges in the 5 countries and prepare a 5 year Plan for the work.
- All remaining activities necessary to complement the objectives of the Program.

**Results:**  
The project implemented in accordance with the terms of its individual components, with the proper quality, on time and establishing a basis for future work in the 5 countries with the participation of the CIC.

**Duration:**  
The duration for these tasks is 60 months

**Consultant 2**

**Objective:**  
IWRM-climate specialist

**Activities:**  
The Project assigns a great importance to the activities linked to climate change. For this reason, the Project calls for a great quantity of tasks within Component III, Adaptation to Climate Variability and Change Scenarios and Adaptation to Climate Change. The complexity of the tasks and the significant costs predicted require that this component of the project receive special coordination. As such, the consultant must possess broad understanding of the studies that have been made and the level of preparation of the project and must coordinate the following tasks:  
Development and use of Regional Climate Scenario: a) Training and planning activities, b) Climate scenarios for the LPB according to different possible emission scenarios, c) Development of hydrological scenarios  
Vulnerability assessment: a) Hydrological alert needs – risk maps, b) Estimation of climate change impacts  
Adaptation measures and public awareness: a) Studies of adaptation to climate change, b) Social communication and relations with users.  
For this the consultant must:  
Establish an appropriate work rhythm for the implementation of the Program and maintain its communications at the various levels and with the various actors involved, following the objectives. Insure that the participative process is maintains fluid and efficient communication with the national executive agencies, with other contributing agencies, and with the GEF projects in existence in the basin. Organize meetings, workshops and seminars planned or deemed necessary during the implementation of the Program.  
Define the scope of work of the different activities and prepare the Terms of Reference of consultancies during this period provided in the time required.  
Develop reports quarterly, semiannual and annual submission to the relevant authorities.  
Any other activities necessary to assist the objectives of component III.

**Results:**  
Component III executed in accordance with the terms of its individual components, with proper quality, on time and establishing a basis for future work in the 5 countries with the participation of the CIC.

**Duration:**  
The duration for this task is 36 months.

**Consultant 3**

**Objective:**  
Multilingual Secretary

**Activities:**  
The secretary must be able to accomplish all of the activities required as secretary and must be able to

work in Spanish, English, and Portuguese.

**Results:**

Support of an efficient secretary.

**Duration:**

The duration for this task is 60 months

**Consultant 4**

**Objective:**

Water resources institutional specialist

**Activities:**

Support all activities undertaken by the International Technical Coordinator, collaborate with its management, and assist as necessary during the course of the task. The consultant will be instrumental in the creation and operation of the Project Unit.

**Results:**

The Project Unit functioning adequately

**Duration:**

The duration for this task is 15 months

**Consultant 5**

**Objective:**

Design of the horizontal cooperation plan

**Activities:**

Support the technical coordinator in designing a Horizontal Cooperation Plan.

In doing so the Consultant must develop:

Institutional assessments of the country institutions weakness and strengths & of the design of the Horizontal Cooperation Plan (HCP).

Institutional Workshop to discuss a three year Plan and agreements to implement it.

**Results:**

Identification and assessment of the institutional weakness and strengths for IWRM and strengthening of climate change resilience in the LPB

Technical capacity to assess institutional development in areas of LPB interest.

Agreements and arrangements to implement the HCP

Personnel among the participating countries and institutions trained. Technical institutional capabilities for IWRM and strengthening of climate change resilience in the LPB throughout the 5 countries.

Better knowledge and working relations between institutions and managers dealing with transboundary issues in LPB.

**Duration:**

The duration for this task is 2 months .

**Consultant 6**

**Objective:**

Capacity building & Inter-institutional knowledge exchange plans

**Activities:**

Support the technical coordinator in the design of Capacity building & Inter-institutional knowledge exchange plans

In doing so the consultant must:

Prepare the Rules and TORs for a first round of Inter-institutional knowledge exchanges in the 5 countries

and prepare a five year Plan for the work.

**Results:**

More balanced national capacity for IWR and Climate management, between participant countries and institutions at the LPB scale.

Strongest national institutions with a group of young professionals to execute the IWR and Climate management.

Young professionals trained in executing IWR and climate management activities with a basin wide perspective in the LPB.

**Duration:**

The duration for this task is 2 months

**Consultant 7**

**Objective:**

Water & climate related Legal Consultant.

**Activities:**

Establish a basic methodological framework document for the preparation of national legal reports.

Report, identifying and systematizing common principles and concepts related with IWR & climate management issues in the legislation and institutional structures of the 'PB' countries.

Collecting and integration of the documentation and main achievements and conclusions regarding legal aspects addressed by the GEF IW projects executed in the LPB (Bermejo, Pantanal, FREPLATA and Guaraní).

The consultant must prepare a basic legal document be discussed during the programmed legal workshop.

Preparation of national reports with the national legal background of transboundary importance in the LPB.

5 country legal documents prepared by national entities

Discussion and integration of the national legal and consultant documents.

5 national meetings implemented with national legal specialists on water & climate aspects

International legal workshop with 20 legal and technical national participants, over the course of 3 days with the Consultant supporting as facilitator for legal discussions.

2 documents reproduced and disseminated with conclusions and proposals to improve and enforce existing legal instruments.

**Results:**

Common concepts, principles and technical background in specific legal thematic issues related to IWR/climate management in the LPB identified and legally assessed.

Legal fortification of the integrated cultural, social, economical and environmental basin management, at the different jurisdictional levels in the LPB, under the CIC guidance and coordination, considering the long term goal of a harmonized and integrated resources management system in the La Plata basin.

Integration & assessment of shared concerns related with water and climate management in the executed GEF IW projects inside the LPB.

Legal foundation of the main transboundary waters & climate problems in the LPB

National governments sharing legal foundations, experiences and practices focusing on shared problems in the LPB.

Identification of the national regulations to manage water quality, indices and standards; legal foundations for climatic and hydrological alert systems; and legal foundations for disaster prevention and remediation in water bodies and the related ecosystems

National legal inputs and recommendations to address specific legal water & climate transboundary issues under the La Plata Treaty and the CIC.

Agreement in strategic legal actions for inclusion in the TDA and SAP, or to improve LPB countries capacity to work under agreements in transboundary themes, such as: water quality; hydrological and climatic alert and natural resources protection.

Proposals to harmonize the conceptual, legal and institutional framework necessary to carry out strategic actions addressing natural resources management.

**Duration:**

The duration for this task is 4 months

**Consultant 8**

Objective:  
DSS operation and information management

Activities:  
Maintain a database during the 5 years of the project.

Results:  
Functioning database accessible to the countries for decision-making.

Duration:  
The duration for this task is 60 months

## **Annex 4**

### **DSS Approach and Methodology**

The DSS mainly focuses on the high risk, extreme hydrological events (floods, droughts and water pollution, and alerts for natural and anthropic disasters with transboundary effects), based upon water use and climate variability and change. The first phase of this element of the work is the implementation of DSS during the 5 years scheduled for the completion of the project. Its initial DSS structure is based on a methodology with following principles that were agreed upon during the preparation of the Framework Program:

- The production and supply of information will be decentralized through notarized agreements with hydrometeorological, spatial, socioeconomic, and environmental information services of the countries of the La Plata basin, and business users as well as individual GEF projects and the activities of the Framework Program.
- Access to the database will be free and differentiated by the type of user.
- It will include mechanisms for the dissemination of useful information to the entire community of the La Plata basin.
- The DSS will be the instrument for storage, manage and process data produced, to be used by the LPB Framework Program and for IWRM.
- The DSS will strength the SG/CIC existing SIG under the Digital Map, and will have the capacity to assure the management of geo-referenced data and maps, including the preparation of the LPB base map and thematic related layers.
- Particularly the Project will help the CIC to produce and/or manage the cartographic tools for the hydrologic, climatic, hydroclimatic models, and vulnerability maps.
- The database will be mirrored (reproduced and stored) in national institutions implementing the Framework Program.

The methodological conformation and associated products are:

- The basis for the DSS will be multilateral, made by the governments, institutions, and implementers of the CIC Technical Counterparts.
- The base system to access the information, which generates the Framework Program, will systematize, organize, store and the information available depending on its components will be developed over five years and will be done in coordination with the guidelines and developments of the Digital Map of the SG/CIC.

The DSS will be coordinated in this first phase of its implementation based upon Activity I.2.1 of the Communication Project (Work Element I.2 Promoting Public Participation, Communication, and Education). DSS will broadcast the information for the education and communication activities on the Internet (website) and other media. DSS will assist with the preparation of periodic newsletters and dissemination of publications included in the activity and in this way promotes the process of public participation in the LPB as planned by the Project (Activity I.2.2).

The activities to be carried out as a part of the PDF Block B efforts, in which along with the co-financing of FONPLATA and CONICET of Argentina include establishing a Digital Map for the CIC with the capacity to coordinate the production of basic mapping in the LPB jointly with the official mapping systems of the five participating countries and establish a database of institutions, organizations, programs and projects present in the LPB.

The DSS will complement and make use of the SG CIC's Digital Map capacities. The planned activities of the organization include coordination and monitoring, which will with support from a consultant define an initial working plan to facilitate and support the SG/CIC regarding the inter-relationships of governments and their specialized institutions dealing with hydrometeorological information and reaching preliminary agreements in a working group to be created about



LPB/CIC information. This group, supported by the consultant, will seek to agree upon, structure, and carry out activities of the SSD in the phases, which will be defined later.

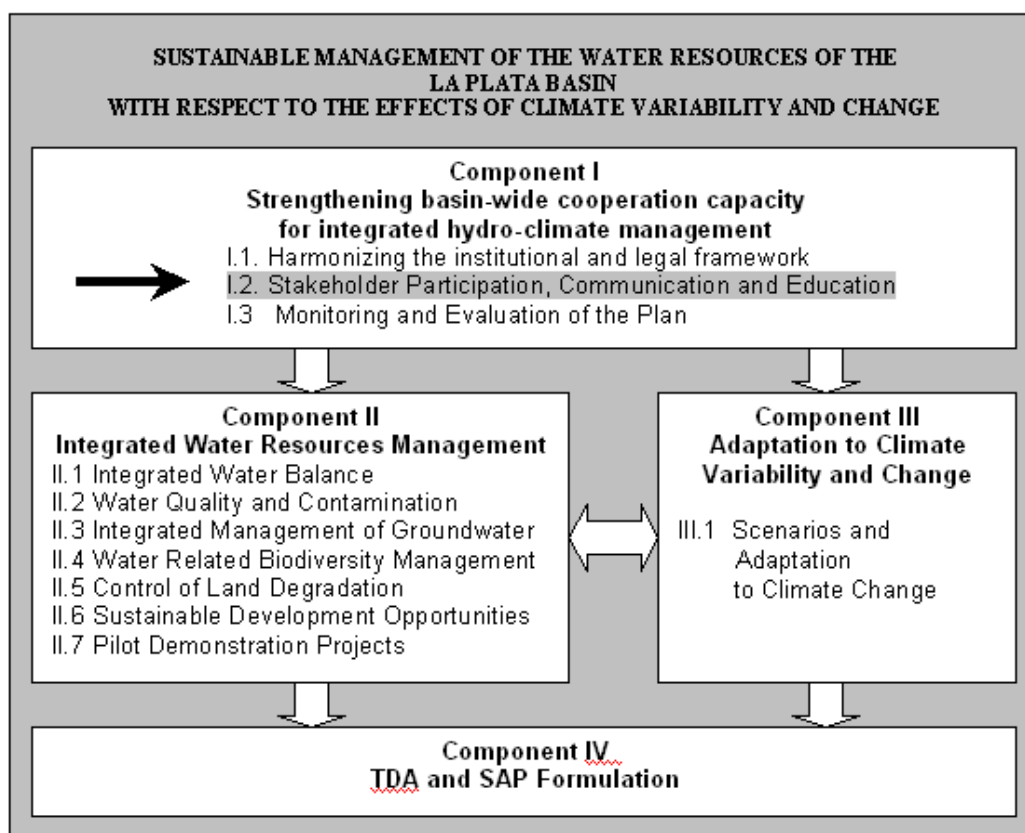
The first phase will provide a basis for the second; (i) Implementing the groundwork for the DSS which seeks to strengthen the agreements and working arrangements of the national institutions already involved (including sub-contracts); (ii) Implementation of a Reference of Water Users, this activity will be coordinated along with Work Element II.1, Integrated Water Balance, which deals with the operation of DSS in present stage. The work will be complemented by a fourth Activity already in operation by the DSS involving the coordination of the CIC Digital Map Project; (iii) Strengthening / Integration of the CIC Digital Map in the production of information to be used in generating maps and geo-referenced SIG-based displays of the models and scenarios of climate change and vulnerabilities associated with this phenomenon for the LPB. This activity will include the technical capacity to use and to incorporate information coming from remote sensing bases and satellite images. All maps to support the management and developments of hydrological, climatic, and hydro-meteorological models will be produced under this activity.

All activities will increase the capacity of CIC countries to share information between institutions and organizations in critical areas related to water resources and climate change for the sustainable development of the LPB. By creating the DSS, the CIC will be equipped to inform and interact with the countries in order to provide information at the corresponding time, place, and form regarding hydro meteorological themes of social, economic, and environmental interest, useful for sustainable development as well as for the reduction of hydroclimatic vulnerability of the LDP, particularly for the agricultural, energy, navigation and nautical tourism sectors. Main outputs will be the systemization and organization of information within a Decision Support System (DSS) for the integrated Management of the Water Resources in the La Plata basin. This will function as an open network with a central node for the LPB in the SG/CIC, and with direct access from the five countries (through a network comprised of five identical mirror centers allowing access to the central database through national gateways). The System will include a Digital Base Map of the basin with the capacity to coordinate the production and management of the basic and thematic maps of the LPB in an integrated way, including the information coming from other GEF Projects, as the Guaraní, FREPLATA, Bermejo and Alto Paraguay projects. The DSS, as a final project output, will integrate a hydrometeorological and climate database for the LPB including information about the uses and users of water, climate projection data (variability and change), as well as the principle social, economic, and environmental information. The information will be available and will be powered by a network of national hydroclimatic information systems as well as those created by the GEF-IW projects. The DSS will be able to integrate, manage, and systematize cartographic and geo-referenced information and will be accessible to interested users. The process of implementing the system will be institutionalized within the operating institutions of the national hydroclimatic information systems with the endorsement of the Foreign Affairs Ministries of the five countries. The system will deliver requested data with the support and technical advice of the National Coordinators of the Project

**SUBCOMPONENT  
I.2  
Stakeholder Participation, Communication and Education**

**Part 1: Project Identifiers**

**1.1 Sub-project title:** Stakeholder Participation, Communication, and Education  
**1.2 Link to umbrella project:** Component I, Strengthening basin-wide cooperation capacity for integrated hydro-climate management.



**1.3 Geographical scope:** La Plata Basin  
**1.4 Executing Agency/entity:** CIC in cooperation with the following national institutions:  
 Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.  
 Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.  
 Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).  
 Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.  
 Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).  
**1.5 Duration:** 5 years  
**1.6 Focal area(s):** IV  
**1.7 GEF grant:** \$ 655,000  
**1.8 Co-financing:** \$ 366,280  
**1.9 Total funding:** \$ 1,021,280  
**1.10 Associated financing:** None  
**1.11 Contact person:** Miguel Angel López Arzamendia

Title: CIC Secretary General and Project Director  
 Tel: (54-11) 431 22 506  
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**1.12 Project summary:** The **objective** of Subcomponent I.2 is to enable increased awareness to strengthen active, structured, and responsible multi-stakeholder participation in the formulating the SAP and engaging in basin activities. Hence, the **outcome** will be enhanced communication and public participation, increased public awareness among stakeholders and civil society, facilitated through the Public Participation Fund (PPF), and broad public engagement in basin activities and formulation of the SAP. It should be noted that public participation and involvement is inherent in all of the project activities. It is expected that representatives of the participating communities in these pilot demonstration projects will form a consultative committee able to assist other communities in replicating successful interventions, a consortium of expertise able to participate meaningfully in local decision making, and a case study in successful public-private partnership that could serve as the basis for “lessons learned” from this project to be highlighted through the IWRN and IW-LEARN networks. The Public Participation will cover the following **activities**: i) enhancing the database of and interaction with stakeholders identified by the Institutional Mapping Tool; ii) identifying new coordination mechanisms building on the experiences, practices and achievements of other GEF projects being executed in the La Plata Basin; iii) establishing inter-institutional agreements to coordinate the activities and mandates of the various commissions, agencies and organizations working in the La Plata Basin; iv) including civil society organizations in the preparation, negotiation and approval process of the TDA and the SAP; v) communicating and disseminating information on the framework strategies of the Basin including on the need for adaptation and relevant responses; vi) executing environmental education activities and training in IWRM, and promoting comprehensive stakeholder participation; vii) based on the WB-OAS Guarani project experience, establishing a Fund for the Promotion of Public Participation that will facilitate the active commitment of social organizations in the management of critical issues; and viii) executing the pilot demonstration projects to be executed with local communities. Subcomponent I.2 will be executed throughout the 5-year Project period.

The framework program, a product of the PDF-B activities, was prepared with the active involvement of responsible governmental institutions in each country, the academic sector, universities and investigatory research centers, and civil society. During the preparation process, specialized personnel were present include civil organizations in the process. This participative dimension strengthens Basin governance, and is present in each of the Components to be executed during the project, in particular in Component I, which proposes a strategic program for stakeholder involvement and participation. Promoting public participation in this project is integral and transversal to the process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society—with special focus on gender equity and indigenous peoples. This involvement also will favor appropriations and the social sustainability of the SAP during its formulation and implementation, consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

**Summary Table of Subcomponent Work Elements, Output, and Outcome**

Work Element	Output	Outcome
I.2.1 Public Participation	I.2.1 Public Participation Program	With transparent access to information about the importance of IWRM and of the quality of natural resources, an increase in stakeholders and civil society, participation involved in the pilot projects, the TDA and SAP formulation
I.2.2 Public Education	I.2.2 Public Awareness Education Program	Through a public education program, of courses, workshops, and seminars stakeholders are prepared to participate responsibly in the process of the integrated management of water resources
I.2.3 Public Participation Fund	I.2.3 Public Participation Fund (PPF) for IWRM	Fund promotes public participation with operating rules of procedures, eligibility criteria, funding and other requirements supports

### Summary Table of Subcomponent Work Elements, Funding Sources and Costs

Work Elements	Sources of funding				Total Cost (US\$)
	GEF Funding* (US\$)		Co-financing# (US\$)		
I.2.1 Public Participation	200,000	20%	162,791	16%	362,791
I.2.2 Public Education	255,000	25%	203,489	20%	458,489
I.2.3 Public Participation Fund	200,000	20%	0	0%	200,000
<b>TOTAL</b>	<b>655,000</b>	<b>65%</b>	<b>366,280</b>	<b>35%</b>	<b>1,021,280</b>

(#) Only Government Counterpart.

(\*) The cost of the Activity “Incorporating Good Practices and Lessons Learned in the Preparation of the TDA and the SAP” is included in “Component IV TDA and SAP Preparation”

## Part 2: Subcomponent design

### 2.1 Background and context:

Background and introduction The importance of public participation in issues related to environmental protection and sustainable development has increased globally and is a sensitive issue for the La Plata Basin. This process goes hand-in-hand with strengthening democracy and increasing awareness with regard to the sustainable management of natural resources and the environment as a responsibility of both state institutions and civil society. Water resource management is performed locally; therefore, experiences from the priority and pilot demonstration projects will contribute information and fundamental experiences to the SAP. Awareness of the need for public participation in development-related activities has grown at the local government level—in some cases conditioned by the opening of channels and opportunities for participation in the management processes.

One of the decisions that arose from the Earth Summit in Rio de Janeiro (1992) was the adoption of sustainable development concept as a model. Sustainable development is based upon public participation in the establishment of development strategies, which should have the capacity to integrate economic, social and environmental policies. Principle 10 of the Rio Declaration 3 states that “the best way to treat environmental issues is with the participation of all the citizens at the corresponding levels: at the national level, every person should have adequate access to the information on the environment from public authorities, including information on dangerous materials and activities for their communities, as well as opportunities to participate in decision-making processes, while the State should facilitate and promote awareness and participation of the population by making the information available.” These statements were also included in Chapter 40 of *Agenda 21* (Rio de Janeiro, 1992), “Information for the decision-making,” and in the Declaration of Johannesburg (2002), adopted during the World Summit on Sustainable Development. Since Rio de Janeiro Declaration, these concepts have been reinforced and expanded through concrete experiences. Within the framework of the OAS, the “Inter American Strategy for the Promotion of Public Participation in Decision-Making for Sustainable Development”, commonly known as the ISP, states that “Public Participation refers to every interaction between the public sector and civil society including a process through which the government and civil society initiate a dialogue, establish alliances, share information and interact to design, execute and evaluate policies, projects and development programs. The process requires the participation and commitment of all interested parties, including the poor and traditionally marginalized groups, such as disadvantaged ethnic minorities, among others.” Programs of development and environmental management are particularly directed toward civil society, which, according to the ISP, “is organized in different ways and sectors, and includes individuals, the private sector, the labor sector, the political parties, academia, other stakeholders, and non-governmental organizations.” The ISP defines a

cross-cutting method of working and integrating activities that specifically includes activities involving different stakeholders; working with a focus on gender issues; providing incentives for communication, education and financing of actions and proposals; interacting with key stakeholders; operating with transparent procedures; building capacity of the private and public sectors and creating jobs at the basin and local levels; and facilitating, in the work places, the creation of sustainable environments.

In addition, the Global Environmental Facility (GEF) establishes certain principles regarding participation by civil society that have been utilized in the preparation of this PPP, within the context of the SAP. Within the GEF context, stakeholder participation is designed to:

- Contribute to the sustainability of environmental, economic, financial, and social interventions.
- Create and implement a flexible methodology in accordance with the local conditions of the countries benefiting from the project.
- Conduct projects, within a framework of transparency and openness, which allow documentation of their implementation through the participatory process, so as to maintain a documentary base that describes how participatory development is implemented.
- Facilitate the exchange of good practices aimed at public and civil society participation.
- Ensure the availability of financial mechanisms within the Executing Agencies to permit participation by governments and NGOs involved in the process.
- Establish—jointly with the Implementing Agency—operational guidelines that promote the effectiveness of the process and the activities developed for public participation, with corresponding monitoring and annual plan revision provisions.

The Public Participation Plan (PPP) for the La Plata Basin Project has been prepared in a manner consistent with the public participation policies and laws of each CIC member country, insofar as they relate to development and environmental management issues, and on the public participation experiences of the GEF-IW funded projects executed in the Basin—particularly during the Bermejo, FREPLATA, Alto Paraguay-Pantanal and the Guarani Aquifer projects—and on the inputs provided by different institutional and social stakeholders during the preparation of the PDF-B. These latter inputs were solicited through a series of consultation meetings, working groups meetings, and national and regional seminars conducted for the definition of the Vision for the Sustainable Development of the La Plata Basin and the baseline TDA.

Statement of Issues Currently within countries of the La Plata basin, the process of participation has begun without due consideration for consolidation. The legal frameworks of the countries are not harmonized and the forecast of participation is different in each of them. Historically the management of water resources has not been adequately controlled, and in some cases, the private sector has made use of them without any sort of oversight. In other cases, the public sector has managed the resource without regard for the opinion of the sectors of society.

Currently, through this project, the region has the opportunity to acquire valuable experience so as to improve basin-wide management vis-à-vis a more comprehensive application of broad public participation.

The project seeks to consolidate the current, fragmented processes and advance the promotion of joint activities with the various sectors involved, with special emphasis on civil society organizations. Shortcomings in the proper handling of information have been detected, as well as the lack of adequate training that has prompted an awareness of the fact that that decisions pertaining to environmental protection should be taken with all information available and with the participation of all relevant stakeholders, taking into consideration the equality of gender, and the inclusion of indigenous and impoverished sectors. There is currently no inclusive process that engages all sectors: private, NGOs, public, social, and academic.

2.2 Subcomponent objective: The **objective** of Subcomponent I.2 is to enable increased awareness to strengthen active, structured, and responsible multi-stakeholder participation in formulating the SAP and related basin activities. A Plan for the Promotion of Public Participation (PPP) was designed for implementation during this project While public participation and involvement is inherent in all of the project activities, the objective of the PPP is to focus and strengthen active, organized and responsible civil society participation in the execution of the project, increasing the knowledge and interaction among and between all riparian organizations, creating the enabling conditions for their participation within the framework of the CIC, and supporting the involvement of key stakeholders. Stakeholder participation serves indeed as an additional safeguard against “mal-adaptive” initiatives and measures. Hence, Component V will focus not only on communication and promotion of public participation, but also on education for responsible and conscious

participation of the stakeholders and civil society, together with the establishment of a Public Participation Fund (PPF).

2.3 Environmental benefits: The information, training, and work culture among the sectors participating in the integrated management of natural resources will engender enhanced results in the development activities, as the various visions collectively contribute to the basin. The inclusion of society facilitates increased capacity to value natural resources and greater knowledge to influence the improvement of the existing problems. This will enable more people to get involved in conserving the environment with a clear notion of the responsibility that this implies.

2.4 Overall sub Component Outcomes: The project promotes a participatory culture with regard to the management of natural resources, increased levels of education / awareness within the population pertaining to the Basin's management, and effective cross-sectoral involvement in the development of joint projects. The overall outcome the **outcome** will be enhanced communication and public participation, increased public awareness among stakeholders and civil society, facilitated through the Public Participation Fund (PPF), and the engagement of a broad cross-section of civil society in basin activities and the formulation of the SAP

2.5. Consistency of the Subcomponent with national/regional priorities and plans: All countries of the La Plata Basin are granting greater importance to the opinion of civil society in the design and implementation of projects. This is no anomaly, but rather reflects the result of the fact that society itself has sought channels to participate in order to inform national authorities of their opinions and concerns. Organized and responsible participation, in addition to improving the outcomes of the project, shortens deadlines and reduces the costs of project implementation.

2.6 Consistency of the Subcomponent with the GEF strategies and its strategic programs: Subcomponent I.2 enhances communication and public participation, with special emphasis on increased public awareness among stakeholders and civil society, facilitated through the Public Participation Fund (PPF). Further, subcomponent I.2 promotes public participation in the formulation of the SAP and related basin activities. With this approach, the Subcomponent constitutes a coherent set of actions that help to frame the Project within the Strategic Program 3 of the GEF (*Balancing overuse and conflicting uses of water resources in surface and groundwater basins that are transboundary in nature*). It particularly promotes the inclusion and engagement of civil society organizations in the responsible management of water and other natural resources. The Subcomponent promotes the dissemination of information and education concerning responsible management of these resources within an integrated and ecosystem-based approach that promotes cross-border cooperation between the various actors within the Basin, and provides inclusive benefits to all its natural resource users.

2.7 Coordination and linkages to the umbrella project activities and other related activities in the basin: The current Subcomponent is one of the project's fundamental links to the IWRM of the Basin as it involves the execution of actions related to one of the critical themes: public participation in decisions of environmental importance. The project ensures the linkages to the umbrella Component II. The coordination of this subcomponent will be under the supervision of the International Coordinator and linked directly to the development of the TDA and SAP.

#### 2.8 Incremental reasoning:

Baseline Public participation within the framework of the La Plata Basin is based on the engagement of civil society organizations in management and decision-making processes for sustainable development. The legal frameworks in each country guarantee a process of organization and participation by civil society, assigning to them responsibilities in different areas of development and management of natural resources. This focus and will for political openness remains to be finalized within the context of the La Plata Treaty and in the CIC. Still, links have been established, and will be maintained, with civil organizations in the Basin. With the objective of expanding this process during the PDF-B phase, the countries approved the Digital Map Project within the framework of the CIC. The digital database was structured to locate the institutions and projects according to: (i) basins, (ii) sub-basins, and (iii) coverage within the countries, linked with the local executing organizations.

This information and database can be found on the web page of the CIC: [www.cicplata.org](http://www.cicplata.org). The support given to this effort by the General Secretariat of the CIC opened a dialogue for working both inside and outside of the Basin, allowing the approval of nine agreements with the following commissions and agencies:

*a) From outside the Basin:*

- *World Meteorological Organization (WMO)/Organización Meteorológica Mundial (OMM)*, for aid with hydrologic warning and water quality monitoring systems.
- *Amazon Cooperation Treaty Organization (ACTO)/Organización del Tratado de Cooperación Amazónica (OTCA)*, for sharing experiences and information.
- *International Commission for River Basins/Comisión Internacional de Protección del Río (ICPR)*, fostering a cooperation of basins and basin agreements.

*b) From within the Basin:*

- *Uruguay River Commission/Comisión Administradora del Río Uruguay (CARU)*, the Argentine-Uruguayan Commission responsible for the administration of the Uruguay River and for the monitoring and protecting of its waters.
- *ITAIPU Binational/ITAIPÚ Binacional*, the Brasil-Paraguay agency managing the Itaipú dam and reservoir, developing a series of protection projects within microbasins in Brazil with strong community participation and executed by existing organizations in the basin (*Cultivando Agua Boa Project*); working on fish management and protection, and on water quality monitoring; and, developing programs for women, youth, and indigenous populations in the Paraná III region.
- *Commission for the Administration of the La Plata River and Maritime Front/Comisión Administradora del Río de the La Plata y Comisión Mixta del Frente Marítimo. Proyecto FREPLATA*, the Argentine and Uruguayan Project for the La Plata River and its Maritime Front, financed by the GEF and implemented by UNDP.
- *Pilcomayo Basin Commission/Proyecto de Gestión Integrada y Plan Maestro de la Cuenca del Río Pilcomayo*, the tri-national project of Argentina, Bolivia and Paraguay, co-financed by the European Union and headquartered in Tarija, Bolivia.

During the preparation of the framework program, a series of working meetings on transboundary waters were conducted among the different GEF projects being executed in the La Plata Basin, including: (i) Bermejo; (ii) Alto Paraguay-Pantanal; (iii) Guarani Aquifer System; and (iv) the Maritime Front of the La Plata River (FREPLATA). Staff from the GEF land-degradation project in the *Gran Chaco Americano* were also invited to participate in thematic sessions. Each of these projects has developed, or is developing, experiences in public participation that constitute lessons learned for the framework program. These experiences constitute the basis of the working relationships to be established with the main stakeholders involved in the management of the La Plata Basin during the execution of the framework program.

Increment The project contributes to a higher objective set forth by the five signatory countries to the La Plata Basin Treaty--Argentina, Bolivia, Brazil, Paraguay and Uruguay--as coordination of actions and investment in the La Plata Basin for the sustainable management of its water resources with public participation, based upon gender equality and equity toward needy as well as indigenous segments of the population. The increment will be the following: available advisory material, sources of information accessible to the public, training courses, seminars, projects for collaborative work, small businesses in the private sector, academic sector, and local governments. Participation generates support for the national organizations and interaction between academic organizations and civil society organizations from different countries to develop activities of mutual interest. The global benefit of this project is an improvement in the training of the population, permitting and assisting in decision making through better understanding and a stronger foundation.

Incremental reasoning The participation of the GEF in this Subcomponent signifies the commitment of the five countries of the La Plata Basin to work together in coordinating tasks, information preparation, and active social participation in environmental themes, cultural development, improvement in decision-making, and improvement in the quality of projects. A regional approach public participation has been shown to be much more effective compared with undertaking these actions on as a sub-basin or at the national level.

Alternative Failure to execute the project, the current scenario is that of 5 countries acting in their national and sub-national territories using differing legal principles and foundations with different instruments and

institutions with uneven capacities acting in a disorganized and fragmented manner, taking action in through various bi-national or tri-national commissions focusing upon sub-basins or bodies of water, independent from each other. These committees in turn generate projects in critical areas, many of them funded by the GEF which have generally been successful, but which are characterized by repeated and overlapping efforts. There is overlap and repetition in the development of management policies and public participation, in the development of the legal basis or through generating knowledge and environmental education programs in uncoordinated efforts. At the same time, the fragmented approach results in the inability to act on broader issues such as the problems of hydroclimatic system within the macro hydrographic basin. However, the status quo of isolated and uncoordinated national management has been altered in the region with the creation and consolidation of the Southern Common Market (MERCOSUR), within which is Group # 6, which is designed to coordinate environmental policies in the region. Within Group # 6, four of the countries of the La Plata Basin are full members: Argentina, Brazil, Paraguay and Uruguay, while Bolivia participates as a partner country. As its objectives, MERCOSUR seeks improvement in the coordination of environmental policies, primarily related to the liberalization of regional trade, but it has expanded its goals to achieving a broader, more comprehensive regional integration. With the objective to strengthen the working relations and to improve the inclusion of water, land and climate sustainable policies for the LPB, the CIC, supported technically by the Project activities and working tools, will strength working relations with the MERCOSUR system for a more strong coordination with its environmental bodies, Group # 6 and the Ad-hoc Committees dealing environmental issues and natural resources, under the existing signed Agreement between the two institutions.

Responsible institutions: The activities will be carried out by the CIC Secretary General, in cooperation and association with National Executing Agencies, the federal and state agencies of the country governments: Argentina, Subsecretaría de Recursos Hídricos, Secretaría de Ambiente, and Provincial water and environmental agencies, and CONICET. In Bolivia: Ministerio del Agua and the Servicio Nacional de Meteorología e Hidrología. In Brazil: the Secretaría de Recursos Hídricos of the Ministerio de Medio Ambiente and Agencia Nacional del Agua. In Paraguay: the Secretaría del Ambiente and its Dirección General de Protección y Conservación de Recursos Hídricos. In Uruguay the Dirección Nacional de Hidrografía. of the Ministerio de Transporte y Obras Públicas, and the Dirección de Agua y Saneamiento of the Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente. The sectoral activities within Component I are included under the responsible institutions' respective institutional responsibilities included in the respective NPUs.

### 2.9 Work Elements – outputs – outcomes:

Subcomponent Objective & Outcomes	Description of Output indicator	Baseline level	Mid-term target	End-of-project target
Enable increased awareness to strengthen active, structured and responsible multi-stakeholder participation in the formulating the SAP and engaging in basin activities.		0 Communication Plan 0 media options	8 media options identified and framework for material prepared	Communication plan access 8 different media sources with appropriate material related to LPB IWRM and SAP engagement
	Public Education Program with knowledge exchange material pertaining to SAP	0	10 courses in centers of excellence pertaining to SAP	20 courses in centers of excellence pertaining to SAP
	Number of projects completed, using the PPF	0%	40%	100%
Outcome 1.2.1 With transparent access to information about the importance of IWRM and of the quality of natural resources, an increase in stakeholders and civil society,	1.www.cicplata.org; 2.Online interactive virtual forum; 3. Monthly bulletin; 4.Videos and TV spots; 5.Publications with	Various forms of media exist in the basin	Framework for media material prepared for different media options	Communication plan access 8 different media sources with appropriate material related to LPB IWRM and



Subcomponent Objective & Outcomes	Description of Output indicator	Baseline level	Mid-term target	End-of-project target
participation involved in the pilot projects, the TDA and SAP formulation	support from sponsors and thematic committees; 6. Press data and information bulletins; 7. Contests and festivals related to themes in the SAP; 8. Information channels.			SAP engagement
Outcome 1.2.2 Through a public education program, of courses, workshops, and seminars stakeholders are prepared to participate responsibly in the process of the integrated management of water resources	20 workshops and seminar programs (4 per country)	0	50% of work workshops accomplished.	100% completed
Outcome 1.2.3 Fund promotes public participation with operating rules of procedures, eligibility criteria, funding and other requirements supports	Number of projects completed, using the PPF	0%	40%	100%

Detailed description of Work Element activities

Work Element I.2.1: Communication and Promotion of Public Participation

*Objective:* To devise and to execute a Plan for Public Communication within the framework of the Decision Support System (DSS) set up in the CIC, to support the development of knowledge and capacities, and to promote the exchange of information with stakeholders. A draft Public Participation Plan is included in Annex 2 of this Subcomponent document.

*Outcome:* With transparent access to information about the importance of IWRM and of the quality of natural resources, an increase in stakeholders and civil society, participation involved in the pilot projects, the TDA and SAP formulation

*Output:* Public participation program

- Activities:*
- a) Engage stakeholders involvement in managing the LPB
  - b) Document good practices and lessons learnt for preparing the TDA and SAP
  - c) Prepare and implement communication plan
  - d) Engage local participation in priority activities and pilot demonstrations

Work Element Output and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Output I.2.1</b> Public Participation Program	Communication Plan engages stakeholders in riparian countries through different media	0 Communication Plan 0 media options	8 media options identified and framework for material prepared	Communication plan access 8 different media sources with appropriate material related to LPB IWRM and SAP engagement
<b>a) Engage stakeholders involvement in managing the LPB</b>				
1. Concentrate on the expansion of the Institutional Mapping within the Digital Mapping Project of the CIC, supported by CONICET of Argentina, to analyze and characterize the organizations and projects included therein. This will be utilized in order to identify and fortify links for formal work on themes prioritized by the Framework			As a result, there will be a series of agreements on important issues signed with the CIC, with the goals of: 15 additional agreements signed outside of the Fund during the first five-year period;	

<p>Program.</p> <ul style="list-style-type: none"> <li>▪ Starting from the first year, the formalize work agreements will be facilitated within a limited group of stakeholders to develop equity between the numerous agreements currently in place within the Basin. The objective will be to create a synergy of efforts among the CIC and key stakeholders to conduct actions on themes related to the La Plata Basin.</li> <li>▪ It includes:             <ul style="list-style-type: none"> <li>(i) refining the Institutional Mapping within the Digital Mapping Project of the CIC;</li> <li>(ii) coordinating and linking the activities of the SAP with other GEF projects being implemented in the La Plata Basin; and</li> <li>(iii) identifying areas of interest for coordinated work and formalizing agreements with commissions, agencies and organizations of the La Plata Basin, including those selected for financing by the Fund for the Promotion of Public Participation.</li> </ul> </li> </ul> <p>2. The organizations, commissions and projects that sign an agreement will constitute an Ad-Hoc Council for the project that will be constituted to follow-up the work of the Fund. If necessary, it will recommend adjustments and provide recommendations to the Steering Committee of the Project (CDP). This Ad-Hoc Council will meet after approval of the projects to be supported through the Fund and twice a year thereafter, with an agenda defined by the Director of the Project and the Technical Coordinators, and distributed to participants at least 15 days before the meetings of the CDP.</p> <p>3. The SAP will finance only one of the annual meetings. Of the total of four meetings to be held during the execution of the SAP, the second and subsequent annual meetings of this Council will be the responsibility of the interested agencies and organizations.</p>	<p>The establishment of an Ad-Hoc Council for public participation in IWRM within the La Plata Basin; and the creation of a work process for ensuring responsible (future) participation by stakeholders within the CIC. This process will facilitate coordination with the academic, private sector and civil society organizations, as well as with the commissions and projects in the Basin</p>
<p><b>b ) Document good practices and lessons learnt for preparing the TDA and SAP</b></p>	
<p>1. The general objective of this Activity is to create a Transboundary Diagnostic Analysis (TDA) that considers, integrates and defines with a scientific analysis, the main environmental problems acknowledged by society, and to identify and prepare a Strategic Action Program (SAP) based on the proposals for strategic actions with the active participation of civil society.</p> <p>2. Specific objectives include:</p> <ul style="list-style-type: none"> <li>▪ Civil society organizations and academic institutions of the Basin participating actively in planning and management.</li> <li>▪ Transparent decisions regarding projects taken in consultation with competent public institutions in each country and in dialogue with the participating civil society organizations. Women and men participating actively according to their needs, capacities and wills and encouraged by their active involvement in the execution of actions in the management of the Basin.</li> <li>▪ Technical personnel of the competent sectoral institutions, members of civil society organizations, and organizations and water users participating in the preparation of the TDA and SAP.</li> <li>▪ Ministerial authorities defining and validating proposals in their respective fields of responsibility, acting on participatory proposals.</li> </ul> <p>3. The activity includes civil society organizations and the experiences of projects financed by the GEF in the elaboration of the TDA; including academic capacities that provide the scientific and technical base of perceived problems and permit prioritization by the public and private organizations essential for the social sustainability of the proposed planning process. Participation will be facilitated by the definition of prospective settings, national workshops and seminars dealing with the issues of the Basin. The TDA process will include interviews with key actors and meetings of the inter-ministerial working groups (IWG's) of the project in the countries.</p>	<ul style="list-style-type: none"> <li>- Process of identification of strategic actions representative of the interests of the stakeholders involved with the preparation of the TDA and SAP.</li> <li>- Experiences of the participation of organizations, commissions, agencies and other organs of civil society, including municipal, state, and provincial organisms, as a key result for the preparation of the TDA and SAP, allowing for institutional coordination and social validation.(from the civil society which offers experience in defining the TDA and PAE).</li> </ul>

<p>The work of these IWG's will be supported by the analyses and assessments to be completed as part of the Project.</p> <p>4. Virtual fora and videoconferences will be organized, dealing with issues related to the TDA and SAP, particularly among the National Coordinators and Technical Coordinators, facilitated by specialized consultants working on specific themes.</p>	
<p><b>c) Prepare and implement a communication plan</b></p>	
<p>1. The objectives of this Subcomponent are: to devise and execute a Plan of Communication within the framework of the System for Decision-Making within the CIC, to support the development of knowledge and capacities, and to promote the exchange of information with society.</p> <p>2. The following media will be used to facilitate access to information on the La Plata Basin, its problems, root causes, and proposals for actions:</p> <ol style="list-style-type: none"> <li>1) CIC web page, <a href="http://www.cicplata.org">www.cicplata.org</a>;</li> <li>2) Online interactive virtual forum, with organizations and communicators;</li> <li>3) Monthly bulletin;</li> <li>4) Videos and TV spots;</li> <li>5) Publications created with the Fund for the La Plata Basin with support from sponsors and thematic committees;</li> <li>6) Banks of press data and information bulletins;</li> <li>7) Contests and festivals related to themes in the SAP; and</li> <li>8) Establishment of information channels</li> </ol> <p>3. These tasks are planned to be implemented within Component I. Planned actions include:</p> <ul style="list-style-type: none"> <li>▪ Maintaining and updating of the web page of the CIC, inaugurated during the preparation of the SAP.</li> <li>▪ Hiring a communications expert to prepare the Plan of Communication of the SAP and to</li> <li>▪ Provide information and materials to key communicators and specialists.</li> <li>▪ Executing mass dissemination events to present the SAP and its solutions to societies in the affected countries.</li> <li>▪ Preparing different types of brochures and technical publications for the communications media.</li> <li>▪ Coordinating with other GEF projects.</li> <li>▪ Communicating a Basin vision, using information generated and integrated in the Basin.</li> </ul>	<p>A Plan of Communication prepared and executed, with the goal of providing periodic information to at least all the institutions and organizations working in the La Plata Basin (included by the Institutional Mapping tool in the Digital Map);</p> <p>Ongoing access to social communicators and the press in the five countries. The intention is to establish a Publications Fund in the CIC, with "sponsors" financing the elaboration and publication of brochures, and the publication of at least ten documents for print dissemination, videos and TV spots.</p>
<p><b>d) Engage local participation in pilot and demonstration and priority activities</b></p>	
<p>1. The objectives of this activity are linked to the participatory execution of the priority projects and pilot demonstration projects proposed in the SAP, under Component II, which are expected to generate concrete experiences in local participatory management.</p> <p>2. The four priority projects were selected based on the critical threats to the La Plata Basin, with the purpose of providing solutions for possible future replication in similar situations that may be identified in other areas of the La Plata Basin.</p> <p>3. The demonstration projects for the SAYTT (aquifer in semiarid zone), the Missionary Forest (land degradation), and similar larger projects of a unique character within the Basin present an opportunity for the SAP to facilitate the participatory process through local management. These projects were identified and prepared in the local environment, and form a permanent link with the main social and institutional stakeholders involved. During the execution of the SAP each project will constitute local management commissions, with the participation of the stakeholders identified</p>	<p>- The goal is the establishment of the local management commissions for each activity with the active participation of institutional actors and civil society organizations (including the involved municipalities), and the acknowledgement of their existence and operation by the participating countries in each case.</p>

during the preparation process	
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**Working Element I.2.2: Public Education Awareness Program**

*Objective:* of this activity is to incorporate into the Project the technical capacities and scientific knowledge of the various academic institutions in the Basin and complement them with education and training in IWRM<sup>1</sup>..

*Outcomes:* Through a public education program, of courses, workshops, and seminars stakeholders are prepared to participate responsibly in the process of the integrated management of water resources.

*Output:* Public Education Awareness Program

*Activities:* a) Compile and prepare education and training material

b) Sign conventions and agreements between CIC and institutions for knowledge exchange

Work Element objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output I.2.2 Public Education Awareness Program	Public Education Program with course material pertaining to SAP	0	10 courses in centers of excellence pertaining to SAP	20 courses in centers of excellence pertaining to SAP
<b>a) Compile and prepare education and training material</b>				
1. Compile and prepare education and training material  2. Production of Teaching Educational Materials aimed at key sectors to present the common vision of the La Plata Basin, the macro diagnostic analysis of transboundary problems and their root causes and proposing strategic actions agreed upon in the PAE and the legal and institutional framework created by the Treaty of the La Plata Basin.  3. Production of other supplementary educational materials, with information and basic knowledge on the importance of water, the hydrologic cycle, and the interrelationship between land use and climate in the La Plata Basin.			Leveraging key sectors and organizations of civil society to aid in resolving the priority problems of the Basin.  The results will include: a) People with complementary education, measured by the number of participants in courses and seminars promoted by the Program. b) Educational programs specific to the SAP. c) Manuals and educational materials on the priority themes of the SAP. d) At least 20 courses in centers of excellence (or through mobile and/or distance learning courses), implemented within the framework of the Project in the five countries. e) Teaching materials for the courses and education, in part replicated from related GEF projects.	
<b>b) Sign conventions and agreements between CIC and institutions for knowledge exchange</b>				
1. Sign conventions and agreements between CIC and institutions for knowledge exchange <ul style="list-style-type: none"> <li>▪ Conventions and Agreements of the CIC with Ministries of Education, educational institutions and others linked to the issue of water resource management, land use and climate, and in relation to the development of inter-agency cooperation to the issues of highest interest to the River Plate Basin.</li> <li>▪ Facilitation of the formation of educational networks to address cross training on topics of common interest. Use of courses and seminars in the Basin to promote training in topics of interest to improve the integrated management of</li> </ul>			- Agreements with GEF project executing agencies for replication and suitability of successful experiences.  - Cooperation Agreements signed at the university level.	

<sup>1</sup> Special emphasis will be placed on climate and hydrologic warning systems, prevention and adaptation to climate change and variability and their effects on the hydrology of the Basin, and strengthening institutional capacities of civil society organizations on issues related to the priorities of the La Plata Basin. This activity will take advantage of the UNESCO-IHP Program and established agreements between the CIC and specific centers of excellence in the Basin. Successful practices developed by other GEF projects in the La Plata Basin will be transferred—in the case of the Bermejo Project, for example, an environmental education teaching manual has been incorporated into the curricula of most basin schools in both Bolivia and Argentina with the support of the respective Ministries of Environment

Work Element objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<p>water resources of the Basin.</p> <ul style="list-style-type: none"> <li>▪ Facilitation understanding through the exchange of information between trainers and researchers in the La Plata Basin so as to improve basic and specialized education.</li> </ul>				

**Work Element I.2.3: Public Participation Fund (PPF) for the Integrated Management of the Basin.**

*Objective:* Through the Public Participation Fund, private organizations and civil society organizations involved in specific activities,

*Output:* The Fund for Public Participation established with approved Regulations, and the financing of up to 20 projects proposed by civil society organizations and/or academic institutions working on critical issues in the La Plata Basin, together with related project reports and documented local impacts. The success of the Fund will be monitored and evaluated initially by the Fund’s Proposal Selection Committee and, subsequently, during the monitoring and evaluation process at the mid-term and end of the Project.

*Outcomes:* Fund promotes public participation with operating rules of procedures, eligibility criteria, funding and other requirements supports

*Output:* Public Participation Fund (PPF)

- Activities: a) Establish a PPF for IWRM  
 b) Organize and facilitate the first call for proposals  
 c) Organize and facilitate the second call for proposals

Work Element Objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output 1.2.3 Public Participation Fund (PPF)	Number of projects completed, using the PPF	0%	40%	100%
<b>a) Establish a PPF for IWRM</b>				
1. Establish a Public Participation Fund (PPF) for adaptive-IWRM. The Fund criteria will promote gender equity criteria and the promotion of disadvantaged groups.			It will seek to generate a process of creative and responsible participation, and, the same time, support important institutional linkages in the management of the Project, helping to resolve issues raised by stakeholders directly involved in the sustainable management of the La Plata Basin. The operation of the Fund will follow specific guidelines and regulations, to be approved during the first meeting of the Steering Committee for the La Plata Basin. The Fund will finance strategic actions as defined in the SAP, focusing on research, dissemination and social promotion, and will support strategies for adaptation to climate change and variability, particularly with respect to the management of wetland corridors.	
<b>b) Organize and facilitate the first call for proposals</b>				
1. Organize and facilitate the first call for proposal. This call will encourage participation by civil society and basin organizations, municipalities and private companies in project initiatives, with a focus on the following two critical themes:			<ul style="list-style-type: none"> <li>- Technical Committee meeting for the selection and revision of proposals and subsequent recommendations to the Steering Committee.</li> <li>- The Technical Committee will also revise and evaluate results and outcome.</li> <li>- Proposal developed and Project implemented.</li> </ul>	
<ul style="list-style-type: none"> <li>▪ Protection of the large wetland corridors of the Paraguay, Paraná, Uruguay and La Plata Rivers, and the ecosystems of key wetlands for the conservation of the enormous wealth of the ichthyic- and coastal fauna affected by the operation of dams and threatened by the modification of land uses and climate change. The benefits are not only of interest for the conservation of one of the world’s largest reserves of coastal and riparian biodiversity,</li> </ul>				

Work Element Objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<p>but also in its recovery and maintenance, having an important impact on climate change. The subject of land tenure makes private participation key in resolving issues related to biodiversity protection.</p> <ul style="list-style-type: none"> <li>Adaptation to the effects of climate change, variability, and clean development, replicable within the La Plata Basin, with an impact on surface water or groundwater.</li> </ul>				
<b>c) Organize and facilitate the second call for proposals</b>				
<p>1. Organize and facilitate the second call for proposals.. This call will seek to support the expansion of the knowledge base, enhance capacities, and improve communication on critical themes. Work will be done in conjunction with universities and research and educational centers, and will focus on the following two aspects:</p> <ul style="list-style-type: none"> <li>Projects for research and education on critical themes, as identified in the SAP, linked to the sustainable utilization of water resources and its relationship to climate change and variability. This activity will improve capacities in the countries by financing postgraduate degree theses or post-graduate research on innovative initiatives.</li> <li>Small communication projects from centers of excellence within the La Plata Basin related to the critical themes covered by the SAP.</li> </ul>			<p>- Technical Committee for the selection and revision of proposals and recommendations to the Steering Committee of the Project, as well as subsequent revision and evaluation of the results</p> <p>- Proposal developed and Project implemented.</p>	

2.9 Budget:

Financial Table of the GEF Budget

Concept	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200 Consultants	38,000	18,000	18,000	38,000	18,000	130,000
2200 Subcontracts with institutions	40,000	42,500	82,500	132,500	132,500	430,000
3200 Workshops and Training	0	10,000	10,000	10,000	10,000	40,000
4100 Supplies and Equipment	0	15,000	20,000	0	0	35,000
5302 IW:LEARN	8,000	2,000	4,000	2,000	4,000	20,000
<b>Total</b>	86,000	87,500	134,500	182,500	164,500	655,000

Details of Consultants to be hired for the project

Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
Local Technical Assistance			
Consultant 1	750	27	Hiring a communications expert to prepare the Plan of Communication of the SAP and to provide information and materials to key communicators and specialists.
Consultant 2	750	120	Maintenance of the website and all of the means of periodical communication
Consultant 3	750	27	Design of an educational strategy, complete with the courses and the preparation of the materials that will be used

See ToR in Annex 1.

Details of Sub contracts with Institutions to be hired for the project

Sub contracts	Tasks to be performed	Amount
Subcontract 1	Support the institutions involved in the division of the SAP	\$10.000
Subcontract 2	Establish the courses that may provide excellence within the framework of the strategy of protection.	\$220.000
Subcontract 3	Execution of the projects selected	\$200.000

2.10 Timetable:

Working Element	Activity	Activity Schedule																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>I.2.1 Communication and Promotion of Public Participation.</b>																					
	Increasing the number of active Stakeholders.																				
	Plan of Communication																				
	Enhancing Local participation (Priority Projects and Pilot Demonstration Projects)																				
<b>I.2.2 Education for a Responsible and Conscious Public Participation.</b>																					
	Selection and preparation of courses.																				
<b>I.2.3 Public Participation Fund (PPF) for the Integrated Management of the Basin.</b>																					
	Creating a Public Participation Fund (PPF) for the Integrated Management of the Basin.																				
	First Call for proposals. Implementation.																				
	Second Call for proposals. Implementation.																				

2.11 Cost effectiveness: In general, projects designed exclusively from the vision of the public sector or the private sector without an effective participation of all segments of the population-involved fail to achieve optimal investment and underperform. In that sense, this component of the project allows for a level of responsible and well-trained participation necessary for a successful result. As an additional benefit, an important number of people are trained in issues of management of natural resources, allowing for an improved system of evaluation and decision-making. Cost effectiveness is two-fold when dealing with stakeholder participation, education and communication through both human and financial resources (1) considering the transboundary dimensions of the issue to be addressed and (2) taking transboundary issues in such a manner as to yield global benefits.

Additionally, technical and economic benefits will be maximized due to the synergy achieved through joint action at the local and basin level, particularly building upon the experience of the regional GEF projects. The combined analysis in the five countries allows the countries to address the issue of regional asymmetries and leveling skills, with lower costs and additional benefits offered by integration for future development.

2.12 Risk Analysis

Risk	Rating (L/M/H)	Risk Mitigation Measures
Stakeholders display low willingness to participate	M	- Capitalizing on the experience of other GEF projects in the region and strengthen the systems of information dissemination of this project - Promote information on the expected outputs and outcomes of the Project and motivate involvement by executing projects along with civil society (FPP)
Geographic extent of the Basin, which is a limitation to effective and efficient participation and the active involvement	L	Strong linkages with civil society, professional bodies, and relevant governmental bodies will minimize this risk
Lack of effective integration of co-financing	L	Formal agreements between responsible institutions and the CIC prior to the beginning of Project activities

**2.13 Sustainability:** The project will meet its objectives if the countries of the La Plata Basin are able to maintain, at the end of the GEF funding, the same form of work achieved during the stages of its development. The design of the project, allowing for the involvement of civil society in implementing and strengthening public links to the CIC, will be useful in the sustainability of future actions. As described above, the design of the project creates mechanisms for the dissemination of information, so that it is accessible to all sectors of the population in a way that is neutral to gender and allows for the participation of the most vulnerable sectors of society, such as the indigenous and impoverished populations. The training of a large number of people on issues related to the project, will allow for such people to continue working with this vocation, sustaining interest in the issues of protecting natural resources.

**2.14 Replicability:** The results of the Project will be disseminated through governmental institutions, nongovernmental organizations, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including the institutions related thereto in each of the five countries, will permit the development of information transfer mechanisms to share new knowledge and provide for active coordination and horizontal cooperation in the integrated management of the water resources of the Basin. The pilot project deals with a common upstream problem of the basin and the insight obtained will be easily adopted at the regional level throughout the disseminated process. Since all of the proposed activities are multifaceted in nature and include a strong multi-stakeholder participation element, which will contribute to the “buy-in” of the project constituencies, the prospect for replicating such activities, are high and can be achieved with minimal efforts by exchanging relevant information and experience learned.

**2.15 Execution arrangement:**

1. Communication and Promotion of Public Participation: Identified responsible institutions: The CIC and OSC, Ministries of Education and other riparian educational organizations participating in the production and dissemination of educational materials, and communications and media organizations.
2. Education for a Responsible and Conscious Public Participation: Identified responsible institutions: The CIC and executing institutions in each country incorporating and promoting the inclusion of the civil participation in the Project activities, with technical coordination support within the framework of the SAP, will execute this task in cooperation with the Ministries of Education and educational establishments from the primary to university levels.
3. Public Participation Fund (PPF) for the Integrated Management of the Basin: Identified responsible institutions: The CIC and executing institutions in each country, incorporating and promoting the inclusion of the civil participation in the Project activities, with the support of the Technical Coordinator of the project, will execute this task.

**2.16 Public participation mechanisms:** The participative dimension strengthens Basin governance, and is present in each of the activities to be executed during the project. Promoting public participation in this project is integral present throughout the process, ensuring adequate participation and involvement of the



public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society — with a special focus on gender equity and indigenous peoples. This involvement will also favor appropriations and the social sustainability of the action plan during both its formulation and implementation, including the consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

**2.17 M&E:** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

**PROCESS OUTCOMES AND INDICATORS**

Process OUTCOMES		Process INDICATORS	
Project			Project
Multi-country agreement on transboundary priority concerns, impact and cause			<ul style="list-style-type: none"> <li>- There is a consolidated and adequate organizational and management structure for the framework program implementation for the fifth year of the Program implementation.</li> <li>- Horizontal cooperation activities under way. Training courses designed and implemented. Internships and Inter-institutional knowledge exchanges to participate in the Project activities awarded and executed by the end of the project</li> <li>- Stakeholders participate in the formulation of the TDA and SAP by means of workshops and consultations throughout the project:                             <ul style="list-style-type: none"> <li>Communication and Dissemination: Graphic and written advertising –in newspapers and on the Web with periodic updates of information.</li> <li>Education and Capacity development:                                     <ul style="list-style-type: none"> <li>- Workshops and training.</li> <li>- Inclusion of topics inherent to the environment and its conservation through the media and publications.</li> <li>- Fund to promote public participation with an Operating Rules of Procedure (eligible criteria, amounts and other requirements) in place.</li> </ul> </li> </ul> </li> </ul>
Multi-country agreement on governance reforms and investment to address priority transboundary concern			<ul style="list-style-type: none"> <li>- Constitution of a group of the organizations of the civil society and the academic sector involved with the project and linked with the CIC for the improvement of the Basin.</li> <li>- Reports and minutes of meetings of the group.</li> </ul>
Effective national Inter-ministry Coordination			<ul style="list-style-type: none"> <li>- Inter-ministerial mechanism established at the national level to agree to the execution with the organization of the civil society and the academic sector.</li> <li>- Reports and minutes of meetings of the national groups.</li> </ul>

Process OUTCOMES			Process INDICATORS
Project			Project
Stakeholder involvement			<ul style="list-style-type: none"> <li>- Increase awareness of and participation in the project activities through more than xx project developed and implemented. Workshops and meetings with local authorities, institutions, and stakeholders. Participants from indigenous communities.</li> <li>- Preparation and wide dissemination of project-related documentation and project-related activities through the fund for civil society.</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions			<ul style="list-style-type: none"> <li>- cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>- Institutional strengthening (training and equipment) provided to institutions related to the stakeholder organization, communication and education.</li> </ul>

## ANNEXES

## Annex 1: Terms of Reference for Consultants

**Consultant 1****Objective:**

Development of a Communication Plan

**Activities:**

Establishment of information channels

Prepare the Communications Plan of the SAP and provide information and materials to key communicators and specialists.

Communicating a Basin-wide vision, using information generated and integrated in the Basin.

**Results:**

The Communications Plan will define channels of information to be used, the strategy to be followed and will define the materials for use in communications, in light of all the information generated, available and of interest to society.

**Duration:**

The duration for this work is 6 months

**Consultant 2****Objective:**

Preparation of the materials to be used in the dissemination of the Project and its maintenance throughout the execution of the project.

**Activities:**

The consultant should design, create, and maintain activities such as:

An online interactive virtual forum, with organizations and communicators;

A monthly bulletin;

Publications created with the Fund for the La Plata Basin with support from sponsors and thematic committees;

Databases of press data and information bulletins;

Maintaining and updating of the web page of the CIC, inaugurated during the preparation of the SAP.

**Results:**

System set up and operational throughout the execution of the project.

**Duration:** The duration for this work is 54 months.

**Consultation 3****Objective:**

Development of educational programs

**Activities:**

The project should contribute to society through educational courses in the five countries. To this end, the consultant must develop educational programs specific to the SAP, manuals and educational materials on the priority themes of the SAP.

Teaching materials for the courses and education, in part replicated from related GEF projects.

**Results:**

Availability of educational programs, with courses defined and supported with materials developed for this purpose.

**Duration:**

The duration for this task will be 9 months.

**ANNEX 2**

**DRAFT PUBLIC PARTICIPATION PLAN (PPP)**

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- 1. Background and Objectives of the Public Participation Plan**
- 2. Conceptual and Methodological Framework**
- 3. Starting Point (baseline)**
- 4. Activities, Goals and Products of the Public Participation Plan**
  - 4.1. Increasing Stakeholder Participation in the Management of the la Plata Basin
  - 4.2. Good Practices and Lessons Learned in the Preparation of the MTDA and FSAP
  - 4.3. Education for Responsible and Conscious Public Participation
  - 4.4. Communication and Promotion for Public Participation
  - 4.5. Public Participation Fund
  - 4.6. Local Participation (Pilot Demonstration and Priority Projects)
- 5. Monitoring and Evaluating the PPP**
- 6. Costs**
- 7. References**

## 1. Background and Objectives of the PPP

The Public Participation Plan (PPP) for the la Plata Basin Project has been prepared in a manner consistent with the public participation policies and laws of each CIC member country, insofar as they relate to development and environmental management issues, and on the public participation experiences of the GEF-IW funded projects executed in the Basin—particularly during the Bermejo, FREPLATA, Alto Paraguay-Pantanal and the Guarani Aquifer projects—and on the inputs provided by different institutional and social stakeholders during the preparation of the PDF-B. These latter inputs were solicited through a series of consultation meetings, working groups meetings, and national and regional seminars conducted for the definition of the Vision for the Sustainable Development of the la Plata Basin and the Macro Transboundary Diagnostic Analysis (MTDA).

**The goal of PPP is to strengthen active, organized and responsible civil society participation in the integrated management and sustainable development of the la Plata Basin.** Given the important geographic, social and economic dimensions of the la Plata Basin, the PPP was developed in parallel with the FSAP strategy and is organized in phases—with short- (5 years), medium- (10 years) and long- (15 years and longer) term objectives. The first phase of the FSAP<sup>2</sup> involves increasing knowledge and interaction among all the organizations that are already working in the Basin, creating the conditions necessary for participation within the framework of the CIC, supporting the involvement of key stakeholders, and making the necessary decisions to foster organized participation in the management of the La Plata Basin. In order to achieve these goals, the following activities are proposed: (i) expanding the database of the Basin's stakeholders, by strengthening the Institutional Mapping activity conducted during the PDF-B Phase, as part of CIC's Digital Map; (ii) specifying new coordination and articulation activities based upon the experiences, practices and achievements of other GEF projects being executed in the la Plata Basin; (iii) establishing inter-institutional agreements to implement the preparatory process in commissions, agencies and organizations working in the la Plata Basin; (iv) including civil society organization in the preparation of the TDA and the SAP; (v) implementing communications and information dissemination actions within the framework of the Basin; (vi) executing educational activities and training in IWRM in the Basin to assist key stakeholders in promoting increased and better participation of civil society; (vii) establishing a Fund for the Promotion of Public Participation to facilitate the active commitment of social organizations in the management of critical issues and concerns; and, finally, (viii) executing four priority projects and two pilot demonstration projects in critical local situations. Some elements of the PPP complement and/or are included within other project Components.<sup>3</sup>

## 2. Conceptual and methodological framework

The importance of public participation in issues related to environmental protection and sustainable development has increased globally and is a sensitive issue for the la Plata Basin. This process goes hand-in-hand with strengthening democracy and increasing awareness of the sustainable management of natural resources and the environment as a responsibility of all and not only of State institutions. Water resource management is performed locally; therefore, experiences from the priority and pilot demonstration projects will contribute information and fundamental experiences to the SAP. Awareness of the need for public participation in development has grown at the local government level—in some cases conditioned by the opening of channels and opportunities for participation in the management processes.

One of the decisions that arose from the Earth Summit in Rio de Janeiro (1992) was the adoption of sustainable development concept as a model. Sustainable development is based upon public

<sup>2</sup> The Framework SAP (FSAP) was developed during the PDF-A, and remains the overarching strategic document. This project will formulate a SAP based on a Basin-wide TDA also developed under this proposed project.

<sup>3</sup> For example, a public and stakeholder involvement and participation activity is explicitly included within the pilot demonstration project Subcomponent, but cross-referenced herein for completeness.

participation in the establishment of development strategies, which should have the capacity to integrate environmental policies with economic and social policies. Principle 10 of the Rio Declaration<sup>4</sup> states that “the best way to treat environmental issues is with the participation of all the citizens at the corresponding levels: at the national level, every person should have adequate access to the information on the environment from public authorities, including information on dangerous materials and activities for their communities, as well as opportunities to participate in decision-making processes, while the State should facilitate and promote awareness and participation of the population by making the information available.”

These statements were also included in Chapter 40 of *Agenda 21* (Rio de Janeiro, 1992), “Information for the decision-making,” and in the Declaration of Johannesburg (2002), adopted during the World Summit on Sustainable Development. Since Rio de Janeiro Declaration these concepts have been reinforced and expanded through concrete experiences.

Within the framework of the OAS, the “Inter American Strategy for the Promotion of Public Participation in Decision-Making for the Sustainable Development”, commonly known as the ISP, states that “Public Participation refers to every interaction between the public sector and civil society including a process through which the government and civil society initiate a dialogue, establish alliances, share information and interact to design, execute and evaluate policies, projects and development programs. The process requires the participation and commitment of all interested parties, including the poor and traditionally marginalized groups, such as disadvantaged ethnic minorities, among others.” Programs of development and environmental management are particularly directed toward civil society, which, according to the ISP, “is organized in different ways and sectors, and includes individuals, the private sector, the labor sector, the political parties, academia, other stakeholders and non-governmental organizations.”

The ISP defines a cross-cutting method of working and integrating activities that specifically includes activities involving different stakeholders; working with a focus on gender issues; providing incentives for communication, education and financing of actions and proposals; interacting with key stakeholders; operating with transparent procedures; building capacity of the private and public sectors and creating jobs at the basin and local levels; and facilitating, in the work places, the creation of sustainable environments.

In addition, the Global Environmental Facility (GEF) establishes certain principles regarding participation by civil society that have been utilized in the preparation of this PPP, within the context of the SAP. Within the GEF context, stakeholder participation is designed to:

- Contribute to the sustainability of environmental, economic, financial, and social interventions.
- Create and implement a flexible methodology in accordance with the local conditions of the countries benefiting from the project.
- Conduct projects, within a framework of transparency and openness, which allow documentation of their implementation through the participatory process, so as to maintain a documentary base that describes how participatory development is implemented.
- Facilitate the exchange of good practices aimed at public and civil society participation.
- Ensure the availability of financial mechanisms within the Executing Agencies to permit participation by governments and NGOs involved in the process.
- Establish—jointly with the Implementing Agency—operational guidelines that promote the effectiveness of the process and the activities developed for public participation, with corresponding monitoring and annual plan revision provisions.

### 3. Baseline

Public participation within the framework of the la Plata Basin is based on the participation of civil society organizations in the processes of management and decision-making for sustainable development. The legal frameworks of each country guarantee a process of organization and participation by civil society, assigning to them responsibilities in different areas of development and management of natural resources. The diverse jurisdictional structures of the participating countries allow for more complex means of participation, such as in the case of Argentina and

<sup>4</sup> UN Declaration on Environment and Development, 1992.

Brazil. This focus and will for political openness remains to be finalized within the context of the la Plata Treaty and in the CIC. Still, links have been established, and will be maintained, with civil organizations in the Basin. With the objective of expanding this process during the PDF-B phase, the countries approved the Digital Map Project within the framework of the CIC. The digital database was structured to locate the institutions and projects according to: (i) basins, (ii) sub-basins, and (iii) coverage within the countries, linked with the local executing organizations. This information and database can be found on the web page of the CIC: [www.cicplata.org](http://www.cicplata.org). The support given to this effort by the General Secretariat of the CIC opened a dialogue for working both inside and outside of the Basin, allowing the approval of nine agreements with the following commissions and agencies:

**From outside the Basin:**

- *World Meteorological Organisation (WMO)/Organización Meteorológica Mundial (OMM)*, for aid with hydrologic warning and water quality monitoring systems.
- *Amazon Cooperation Treaty Organization (ACTO)/Organización del Tratado de Cooperación Amazónica (OTCA)*, for sharing experiences and information.
- *International Commission for River Basins/Comisión Internacional de Protección del Río (ICPR)*, fostering a cooperation of basins and basin agreements.

**From within the Basin:**

- *Uruguay River Commission/Comisión Administrator del Río Uruguay (CARU)*, the Argentine-Uruguayan Commission responsible for the administration of the Uruguay River and for the monitoring and protecting of its waters.
- *ITaipu Binational/ITaipú Binominal*, the Brazil-Paraguay agency managing the Itaipú dam and reservoir, developing a series of protection projects within micro-basins in Brazil with strong community participation and executed by existing organizations in the basin (*Cultivando Agua Boa Project*); working on fish management and protection, and on water quality monitoring; and, developing programs for women, youth, and indigenous populations in the Paraná III region.
- *Commission for the Administration of the la Plata River and Maritime Front/Comisión Administrator del Río de the la Plata y Comisión Mite del Fronted Maritime. Projector FREPLATA*, the Argentine and Uruguayan Project for the la Plata River and its Maritime Front, financed by the GEF and implemented by UNDP.
- *Pilcomayo Basin Commission/Projector de Gestación Integrate y Plan Maestro de la Cuenca del Río Pilcomayo*, the tri-national project of Argentina, Bolivia and Paraguay, co-financed by the European Union and headquartered in Tarija, Bolivia.

During the preparation of the FSAP, a series of working meetings on transboundary waters were conducted among the different GEF projects being executed in the la Plata Basin, including: (i) Bermejo; (ii) Alto Paraguay-Pantanal; (iii) Guaraní Aquifer System; and (iv) the Maritime Front of the la Plata River (FREPLATA). Staff from the GEF land-degradation project in the *Gran Chaco Americano* were also invited to participate in thematic sessions. Each of these projects has developed, or is developing, experiences in public participation that constitute lessons learned for the FSAP. These experiences constitute the basis of the working relationships to be established with the main stakeholders involved in the management of the la Plata Basin during the execution of the FSAP.

**4. Activities, Goals and Products of the Public Participation Plan**

The PPP is aimed at encouraging and promoting public participation during the initial phase of the FSAP (first 5 years) and is defined in the FSAP, as part of each of the various components, guaranteeing the active presence or participation of key organizations during execution of the Program. In this phase, agreements will be established, conditions created, and opportunities provided for the formal inclusion of the participatory process in the framework of the la Plata Basin Treaty.

The goals at the end of the five years are to: strengthen active, organized and responsible civil society participation in the integrated management and the sustainable development of the la Plata Basin, within the framework of the CIC, based on the work done with civil society organizations; develop a proposal to amend the Regulation of the CIC; and propose a mechanism for consultation and ways to guarantee the participation of civil society organizations (academia, companies, basins authorities, etc.) in the CIC in a manner consistent with the commitments entrusted to that body by the countries. To this end, the outputs will be: (i) a proposed text of the amendment to the Regulation agreed by the National Units of the Program (UNP) and validated in a Validation Seminar conducted under the auspices of the SAP, and (ii) a proposed legal document to regulate this participation within the framework of the CIC that facilitates its operation.

The six groups of activities to be executed are described below, with their objectives and expected results:

**4.1. Increasing the number of active Stakeholders in the Management of the la Plata Basin – Refinement of the Interactive Digital Map.** This will concentrate on the expansion of the Institutional Mapping within the Digital Mapping Project of the CIC, supported by CONICET of Argentina, to analyze and characterize the organizations and projects included therein. This will be utilized in order to identify and fortify links for formal work on themes prioritized by the Framework Program. Starting from the first year, the formalization of work agreements will be facilitated within a limited group of stakeholders to develop equity between the numerous agreements currently in place within the Basin. The objective will be to create a synergy of efforts among the CIC and key stakeholders to conduct actions on themes related to the la Plata Basin. The activity includes: (i) refining the Institutional Mapping within the Digital Mapping Project of the CIC; (ii) coordinating and linking the activities of the SAP with other GEF projects being implemented in the la Plata Basin; and (iii) identifying areas of interest for coordinated work and formalizing agreements with commissions, agencies and organizations of the la Plata Basin, including those selected for financing by the Fund for the Promotion of Public Participation.

Those organizations, commissions and projects that sign an agreement will constitute an Ad-Hoc Council for the project that will be constituted to follow-up the work of the Fund. If necessary, it will recommend adjustments and provide recommendations to the Steering Committee of the Project (CDP). This Ad-Hoc Council will meet after approval of the projects to be supported through the Fund and twice a year thereafter, with an agenda defined by the Director of the Project and the Technical Coordinators, and distributed to participants at least 15 days before the meetings of the CDP. The SAP will finance only one of the annual meetings. Of the total of four meetings to be held during the execution of the SAP, the second and subsequent annual meetings of this Council will be the responsibility of the interested agencies and organizations.

As a result, there will be a series of agreements on important issues signed with the CIC, with the goals of: 15 additional agreements signed outside of the Fund during the first five-year period; the establishment of an Ad-Hoc Council for public participation in IWRM within the la Plata Basin; and the creation of a work process for ensuring responsible (future) participation by stakeholders within the CIC. This process will facilitate coordination with industrial, academic and civil society organizations, as well as with the commissions and projects in the Basin. The costs of these activities have been included in the Digital Mapping Project of the CIC, except for those of the Fund for PPP that has independent financing under Subcomponent I.2 (see below).

The Activity will be undertaken by the Director of the Project with the support and participation of the Technical Coordinator of the SAP.

**4.2. Incorporating Good Practices and Lessons Learned in the Preparation of the TDA and the SAP.** The general objective of this Activity is to create a Transboundary Diagnostic Analysis (TDA) that considers, integrates and defines with a scientific analysis, the main



environmental problems acknowledged by society, and to identify and prepare a Strategic Action Program (SAP) based on the proposals for strategic actions with the active participation of civil society.

Specific objectives include:

- Civil society organizations and academic institutions of the Basin participating actively in planning and management.
- Transparent decisions regarding projects taken in consultation with competent public institutions in each country and in dialogue with the participating civil society organizations.
- Women and men participating actively according to their needs, capacities and wills and encouraged by their active involvement in the execution of actions in the management of the Basin.
- Technical personnel of the competent sectoral institutions, members of civil society organizations, and organizations and water users participating in the preparation of the TDA and SAP.
- Ministerial authorities defining and validating proposals in their respective fields of responsibility, acting on participatory proposals.

The activity includes civil society organizations and the experiences of projects financed by the GEF in the elaboration of the TDA; including academic capacities that provide the scientific and technical base of perceived problems and permit prioritization by the public and private organizations essential for the social sustainability of the proposed planning process. Participation will be facilitated by the definition of prospective settings, national workshops and seminars dealing with the issues of the Basin. The TDA process will include interviews with key actors and meetings of the inter-ministerial working groups (IWGs) of the project in the countries. The work of these IWGs will be supported by the analyses and assessments to be completed as part of the Project.

The participation of organizations, commissions, agencies and other organs of civil society, including municipal, state, and provincial organisms, will be key for the preparation of the TDA and SAP, allowing for institutional coordination and social validation. Virtual fora and videoconferences will be organized, dealing with issues related to the TDA and SAP, particularly among the National Coordinators and Technical Coordinators, facilitated by specialized consultants working on specific themes.

This will result in a process of identification of strategic actions representative of the interests of the stakeholders involved with the preparation of the TDA and SAP. The Technical Coordinator of the Program has the responsibility of finalizing these documents, supported by thematic consultancies. The GEF cost for this activity will be US \$ 300,000 and counterpart contribution will be US \$ 150,000, inclusive of the time of personnel in the participating institutions and organizations, meeting expenses and direct support from countries.

**4.3. Communicating and Promoting Public Participation.** The objectives of this Subcomponent are: to devise and execute a Plan of Communication within the framework of the System for Decision-Making within the CIC, to support the development of knowledge and capacities, and to promote the exchange of information with society. The following media will be used to facilitate access to information on the la Plata Basin, its problems, root causes, and proposals for actions:

- CIC web page, [www.cicplata.org](http://www.cicplata.org);
- Online interactive virtual forum, with organizations and communicators;
- Monthly bulletin;
- Videos and TV spots;

- Publications created with the Fund for the la Plata Basin with support from sponsors and thematic committees;
- Banks of press data and information bulletins;
- Contests and festivals related to themes in the SAP; and
- Establishment of information channels

These activities are planned to be implemented within Component I. Planned actions include:

- Maintaining and updating of the web page of the CIC, inaugurated during the preparation of the SAP.
- Hiring a communications expert to prepare the Plan of Communication of the SAP and to provide information and materials to key communicators and specialists.
- Executing mass dissemination events to present the SAP and its solutions to societies in the affected countries.
- Preparing different types of brochures and technical publications for the communications media.
- Coordinating with other GEF projects.
- Communicating a Basin vision, using information generated and integrated in the Basin.

Expected results include a Plan of Communication prepared and executed, with the goal of providing periodic information to at least all the institutions and organizations working in the la Plata Basin (included by the Institutional Mapping tool in the Digital Map); ongoing access to social communicators and the press in the five countries. The intention is to establish a Publications Fund in the CIC, with “sponsors” financing the elaboration and publication of brochures, and the publication of at least ten documents for print dissemination, videos and TV spots.

The GEF amount of this activity is US\$ 200,000 with a counterpart of US\$ 162,791 provided by the CIC and the countries through CONICET of Argentina (Digital Map) and the sponsors of the publications.

**4.4. Educating for Responsible and Conscious Public Participation.** The objective of this Activity is to incorporate into the SAP and CIC greater technical capacity and scientific knowledge available from different academic institutions (and through interactions with them) in the advancement of programs of “education and training for the integrated management of water resources and on the hydrologic cycle.” A particular focus will be on climatic and hydrologic warning, prevention and adaptation to climate change and variability, and managing their effects on the hydrology of the Basin. Strengthening institutional capacities and civil society organizations to deal with the issues related to the priorities of the la Plata Basin is also an important aspect of this Component. The program of activities to be undertaken will take advantage of UNESCO-IHP Program and agreements of the CIC with centers of excellence in the Basin related to priority themes. Contributions also will be sought from other GEF projects in the la Plata Basin, as in the case of the Bermejo Project with its successful agreements with the Ministries of Education in the provinces of Argentina for the publication of manuals and teaching materials. The results will include:

- People with complementary education, measured by the number of participants in courses and seminars promoted by the Program.
- Educational programs specific to the SAP.
- Manuals and educational materials on the priority themes of the SAP.
- At least 20 courses in centers of excellence (or through mobile and/or distance learning courses), implemented within the framework of the Project in the five countries.
- Teaching materials for the courses and education, in part replicated from related GEF projects.

The GEF budget for this Activity is US\$ 250,000 with US\$ 203,489 of counterpart in-kind contribution from the countries and educational centers.

**4.5. Creating a Public Participation Fund (PPF) for the Integrated Management of the Basin.** The objective of this Fund, to be created under the Project, is to involve private organizations and civil society organizations in specific activities related to research, dissemination and management of critical issues facing the la Plata Basin, and for which these types of organizations have advantages and capacities. The Fund criteria will promote gender equity criteria and the promotion of disadvantaged groups.

The concept of the Fund is based on the successful application of this type of instrument in the GEF Guarani Aquifer System project, particularly with respect to the funds provided to universities and civil society. It will seek to generate a process of creative and responsible participation, and, the same time, support important institutional linkages in the management of the Project, helping to resolve issues raised by stakeholders directly involved in the sustainable management of the la Plata Basin. The operation of the Fund will follow specific guidelines and regulations, to be approved during the first meeting of the Steering Committee for the la Plata Basin. The Fund will finance strategic actions as defined in the SAP, focusing on research, dissemination and social promotion, and will support strategies for adaptation to climate change and variability, particularly with respect to the management of wetland corridors.

**First Call for proposals.** This call will encourage participation by civil society and basin organizations, municipalities and private companies in project initiatives, with a focus on the following two critical themes:

- Protection of the large wetland corridors of the Paraguay, Paraná, Uruguay and la Plata Rivers, and the ecosystems of key wetlands for the conservation of the enormous wealth of the ichthyic- and coastal fauna affected by the operation of dams and threatened by the modification of land uses and climate change. The benefits are not only of interest for the conservation of one of the world's largest reserves of coastal and riparian biodiversity, but also in its recovery and maintenance, having an important impact on climate change. The subject of land tenure makes private participation key in resolving issues related to biodiversity protection.
- Adaptation to the effects of climate change, variability, and clean development, replicable within the la Plata Basin, with an impact on surface water or groundwater.

Financing is proposed to be US \$ 100,000 from GEF. The purpose is to finance project proposals with a maximum cost to the SAP of US \$ 20,000. The remaining US \$ 5,000 will be used for the preparation and conduct of a Technical Committee meeting for the selection and revision of proposals and subsequent recommendations to the Steering Committee. The Technical Committee will also revise and evaluate results and outcome.

**Second call for proposals.** This call will seek to support the expansion of the knowledge base, enhance capacities, and improve communication on critical themes. Work will be done in conjunction with universities and research and educational centers, and will focus on the following two aspects:

- Projects for research and education on critical themes, as identified in the SAP, linked to the sustainable utilization of water resources and its relationship to climate change and variability. This activity will improve capacities in the countries by financing post-graduate degree theses or post-graduate research on innovative initiatives.
- Small communication projects from centers of excellence within the la Plata Basin related to the critical themes covered by the SAP.

Financing is proposed to be US \$ 100,000 from GEF. The purpose is to finance proposals of US \$ 15,000 max each. US \$ 5,000 will be used for the creation conduct of a Technical Committee for the selection and revision of proposals and recommendations to the Steering Committee of the Project, as well as subsequent revision and evaluation of the results.

In both cases, the co-financing level, the technical quality of the proposals, and their relevance to the formulation of the SAP will be determining factors for selection. The Fund will be open to

donors and calls for proposals could continue to be announced based on the evaluation of the success achieved in the first calls.

The organizations selected for financing will form an Advisory Board for the Project that will monitor the Fund and make recommendations to the SC.

#### **4.6. Enhancing Local participation (Priority Projects and Pilot Demonstration Projects).**

The objectives of this work element are linked to the participatory execution of the priority projects and pilot demonstration projects proposed in the SAP, under Component II, which are expected to generate concrete experiences in local participatory management. The four priority projects were selected based on the critical threats to the la Plata Basin, with the purpose of providing solutions for possible future replication in similar situations that may be identified in other areas of the la Plata Basin. The demonstration projects for the SAYTT (aquifer in semiarid zone), the Missionary Forest (land degradation), and similar larger projects of a unique character within the Basin present an opportunity for the SAP to facilitate the participatory process through local management. These projects were identified and prepared in the local environment, and form a permanent link with the main social and institutional stakeholders involved. During the execution of the SAP each project will constitute local management commissions, with the participation of the stakeholders identified during the preparation process. The cost of this participation has been included in the activities of each priority and pilot demonstration project proposed to be executed. The goal is the establishment of the local management commissions for each activity with the active participation of institutional actors and civil society organizations (including the involved municipalities), and the acknowledgement of their existence and operation by the participating countries in each case.

#### **5. Monitoring and Evaluation of the Plan**

The following table shows the indicators selected for the monitoring of the process of public participation proposed in the Plan, by activity.

#### **6. Costs –Budgets**

The costs for the different activities that promote public participation and that finance the activities of this Plan are included within the Components of the Project. Nevertheless, the following table shows the expected GEF and co-financing amounts for each of the activities corresponding to Components II and III, which constitute the structure of the process of public participation in the present project.

#### **7. References**

- *Guidelines from the “Global Environment Facility's (GEF) Policy on Public Involvement in GEF-Financed Projects” (App. Meeting April 1996)*
- *Second Biennial Global Environmental Facility (GEF) International Waters Conference. October 2002, Dalian, China. (Unido-GEF Test Project. Transferring Environmentally Sound Technologies)*
- *Susana Cabezas M. “Participación Pública en el Programa Marco” Informe Consultoría, January 2005.*
- *Strategy for Public Participation for Decision Making in Sustainable Development in the Americas (ISP) OAS, 1997.*

**MONITORING AND EVALUATION OF THE PUBLIC PARTICIPATION PLAN**

Component I.2

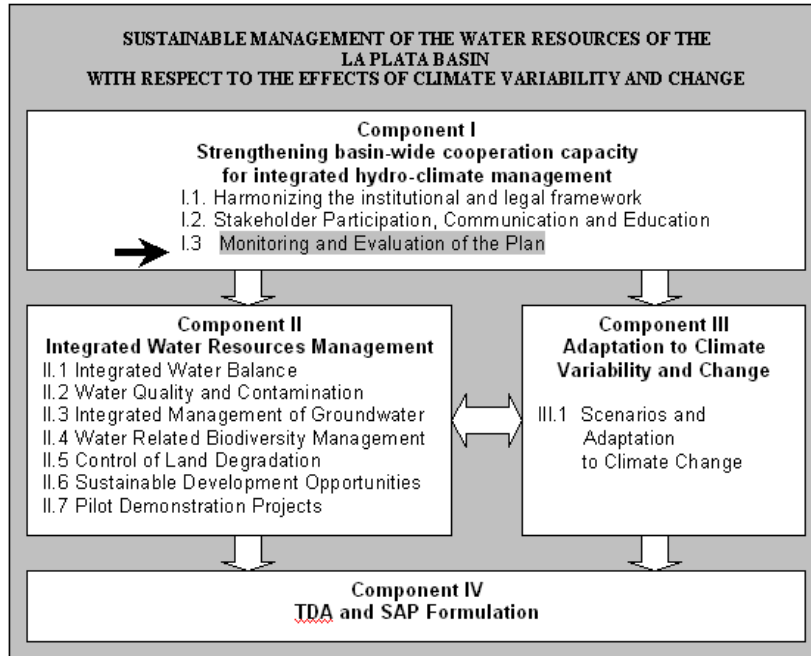
<b>PROCESS INDICATOR</b>	<b>YEAR 1</b>	<b>YEAR 2</b>	<b>YEAR 3</b>	<b>YEAR 4</b>	<b>YEAR 5</b>
New signed agreements with CSO	5 signed agreements	5 signed agreements	5 signed agreements	-	-
Ad-hoc Assessment Committee established and functioning	1 meeting	2 meetings (1 financed by SAP)	2 meetings (1 financed by SAP)	2 meetings (1 financed by SAP)	2 meetings (1 financed by SAP)
Number of CSO participating in the TDA and SAP	Number of key informant interviews for TDA	Number of participants in TDA national and regional meetings	Number of key informant interviews for SAP	Number of participants in SAP national and regional meetings	TDA and SAP documents validated by civil society
Prepared Communication Plan	Brochures distributed. 1 SAP publication available. 1 Video and TV spot available. Database and communication links established.	5 articles disseminated to the press. 2 technical publications. 1 completed radio and TV campaign.	5 articles disseminated to the press. 2 technical publications. 1 completed radio and TV campaign.	5 articles disseminated to the press. 2 technical publications. 1 completed campaign.	2 Documents of the Project published in Spanish, Portuguese and English, distributed in 5 countries.
Courses delivered, Programs defined and Educational Materials prepared	Number of courses delivered, number of participants, length of time of delivered courses	Number of courses delivered, number of participants, length of time of delivered courses	Number of courses delivered, number of participants, length of time of delivered courses	Number of courses delivered, number of participants, length of time of delivered courses	Number of courses delivered, number of participants, length of time of delivered courses
Fund for PPP established. Fund Regulation approved	2 calls performed With an estimate of 12 projects selected and agreements signed	Roughly 12 projects in execution	Roughly 12 projects in execution	Results from roughly 12 projects evaluated	Results incorporated into the SAP
6 local management committees established	6 local management committees working	6 local management committees working	6 local management committees working	6 local management committees working	6 local management plans evaluated and conclusions included in the SAP

**SUB\_COMPONENT**  
**I.3**  
**Monitoring and Evaluation of the Plan**

**Part 1: Project Identifiers**

1.1 Sub-project title: Monitoring and Evaluation of the Plan

1.2 Link to umbrella project: Component I: Strengthening basin-wide cooperation capacity for integrated hydro-climate management.



1.3 Geographical scope: La Plata Basin (See map in Component I.1)

1.4 Executing Agency/entity:

The OAS, CIC and executing institutions in each country, and UNEP will execute this task.

1.5 Duration: 5 years

1.6 Focal area(s): IW

1.7 GEF grant: \$100.000

1.8 Co-financing: \$298.000

1.9 Total funding: \$ 398.000

1.10 Associated financing: --

1.11 Contact person: The same as Component I.1

1.12 Project summary:

The Monitoring and Evaluation Plan (M&E Plan) is an integral part of Project Management, and seeks to provide the means to monitor and evaluate progress and performance in all components of the Project, and achievement of the Project goals. The M&E Plan is comprised by two very distinctive working elements: (1) Monitoring of progress; and (2) Evaluation of performance and achievement. While both components may use the same set of performance/achievement indicators, each uses a different set of tools and processes. Monitoring is characterized by a more frequent set of activities, providing for timely reviews and quick assessments. Often, decision-making lies with the Execution Coordinating Unit. Evaluation, on the other hand, is performed at a predetermined times, and decision-making corresponds to the highest level, the Steering Committee, of the Project.

Responsibilities for monitoring and evaluation are assigned to the various participating institutions—the Local Executing Agency, the Intergovernmental Coordinating Committee (CIC) and national institutions; the GEF Implementing Agency, UNEP; the International Executing Agency, GS/OAS; and different Project officers, according to their management functions and responsibilities. The Plan is guided by the principles of accountability and transparency. These principles apply to both institutions and individuals.

The Plan follows the standard UNEP procedures for Project Monitoring and Evaluation (administrative, technical and financial) which include quarterly and half-yearly progress reports; quarterly and annual statements of expenditures, including co-financing and counter-part contributions; a mid-term review (MTR); and a final evaluation. The MTR will be performed within the next quarter after project execution had reached the mid-term; that is, between the 30th and the 33rd months of project execution, regardless the level of execution and disbursement. The final evaluation will take place once all funds had been disbursed and all activities completed.

In addition to Project Monitoring and Evaluation activities, the M&E Plan includes activities aimed at assessing the effectiveness of the SAP formulation. The purpose of this assessment is to identify corrective measures and/or changes in the SAP project in order to achieve more effectively and timely the Development Objective set forth by the participating countries, as agreed in the Vision for the la Plata Basin, addressing the main transboundary issues and associated global benefits identified in the Macro-TDA.

Performance and Achievement Indicators measure progress in the execution of Project activities, and include measures of procurement and production of goods and services, works and infrastructure, and use of human and monetary resources. They also include specific measurable goals. These indicators are summarized in the Logical Framework Analysis, and are used to monitor the progress of Project execution, assess the achievement of its goals, and evaluate specific outputs. They are also used to evaluate performance. A list of indicators, along with their baseline values, parameters to be measured and means of verification are found in Table 2 of the M&E Plan. It is noteworthy that these indicators may be reviewed during the execution of the Project, baseline values may be adjusted, and new indicators and/or parameters may be added. The monitoring of these indicators may be assisted by Project Management software, such as MicroSoft Project Manager.®

Results: M&E Plan in place. Mid-term Review and Final Review will be available as per the M&E Plan time table, and recommendations for the Steering Committee will be drawn from the monitoring process.

Working Elements	Output	Outcome
1.3.1 Monitoring of progress	M&E System Implemented. Project Implementation Plan (PIP). Work-plans and Timetables, and budgets. Progress Reports. Expenditure Statements (including co-financing). <i>Aide Memoirs</i> of meetings of the Inter-ministry Committee, Public Participation Workshops and DDS/OAS	Country capacity to monitor projects related to IWRM and to replicate “lessons learned” and “best experiences” in other basin projects in the region.

	Supervision Missions.	
I.3.2 Evaluation of performance and achievement	<i>Aide Memoirs</i> of Meetings of the SC. Reports of Mid-Term Review (MTR) , Final Evaluation (FE) and Project Implementation Review (PIR) to the GEF	Plan for long term activities to achieve the sustainable development objective.

Working Element	Sources of funding				Total Cost (US\$)
	GEF Funding (US\$)		Co-financing (#) (US\$)		
II.3.1 Monitoring of progress	\$15.000	4%	\$248.000	62%	\$263.000
II.3.2 Evaluation of performance and achievement	\$85.000	21%	\$50.000	13%	\$135.00
<b>TOTAL</b>	<b>\$100.000</b>	<b>25%</b>	<b>\$298.000</b>	<b>75%</b>	<b>\$398.000</b>

(#) Only Government Counterpart. Co-financing \$0.0

Additional GEF Funds for M&E activities are included in Subcomponent I.1.1, II.7 and Project Management (see detail in 2.7 Budget)



## **Part 2: Project design**

### 2.1 Background and context:

The Monitoring and Evaluation Plan (M&E Plan) is an integral part of *Project Management* and seeks to provide the means to monitor and evaluate progress and performance in all components of the Project, and achievement of its goals. The M&E Plan is comprised by two very distinctive components: (1) Monitoring of progress; and (2) Evaluation of performance and achievement. While both components may use the same set of performance/achievement indicators, each use a different set of tools and processes. The Monitoring is characterized by a more frequent set of activities, providing for timely reviews and quick assessments. Often, decision-making lies on the Execution Coordinating Unit. The Evaluation, on the other hand, is performed at a predetermined number of times, and decision-making corresponds to the highest level, the Steering Committee of the Project.

Responsibilities for monitoring and evaluation are assigned to the various participating institutions –the Local Executing Agency, the Intergovernmental Coordinating Committee (CIC,) and national institutions; the GEF Implementing Agency, UNEP; and the International Executing Agency, GS/OAS; and different Project officers, according to their management functions and responsibilities. The Plan is guided by the principles of accountability and transparency. These principles apply to both, institutions and individuals.

The Plan fulfills the standard EP's procedures for Project Monitoring and Evaluation (administrative, technical and financial,) which include quarterly and half-yearly progress reports; quarterly and annual statements of expenditures, including co-financing and counter-part contributions; and a mid-term review (MTR) and final evaluation. The MTR will be performed within the next quarter after project execution had reached the mid-term. That is within the 30<sup>th</sup> and the 33<sup>rd</sup> months of project execution, regardless the level of execution and disbursement. The final evaluation will take place once all funds had been disbursed and all activities completed.

In addition to Project Monitoring and Evaluation activities, the M&E Plan includes activities aimed to assess the effectiveness of the Framework Strategic Action Program (FSAP) in achieving its goal. The purpose of this assessment is to identify corrective measures and/or changes in the FSAP in order to more effectively and timely achieve the *Development Objective* set forth by the participating countries, as agreed in the la Plata Basin Vision for addressing the main transboundary issues identified in the Macro-TDA. In addition, global benefits will be reviewed and assessed.

### 2.2 Subcomponent objective:

M&E Plan seeks to provide the means to monitor and evaluate progress and performance in all components of the Project, and achievement of its goals.

### 2.3 Activities - Tools and Timeline

Monitoring and evaluating project execution requires a systematic collection and analysis of data, comparison with baseline data, and consideration of needed changes in the plan of operations, resources assignments, and the timetable. Table 1 represents an outline of the major activities, tools and means to undertake the monitoring and evaluation of the Project.

Table 1. Major activities, tools and means of monitoring the project and evaluating progress

M&E PLAN Working Elements Activity	FREQUENCY	SUPPORTING TOOLS		REPORTS/ OUTPUTS	
		GS/OAS MIS (Oracle)	CIC Project Management System (PMS)	Quarterly & Half-yearly Operational Report	Quarterly & Final Expenditure Statement
<b>Monitoring</b>					
Preparation of the Project Implementation Plan (PIP), Work-plans and Time-tables, and budgets	PIP: at the beginning of the Project Work-plans & Time-tables: Quarterly	X	X		
Preparation of Progress Reports	Quarterly			X	X
Preparation of Expenditure Statements (including co-financing)	Quarterly	X	X	X	X
Preparation of counterpart contribution reports	Quarterly		X		
On-site supervision of Demo Projects and FPPP's projects	Monthly	X	X		
Preparation of Progress Reports of the Demo Projects & Studies	Monthly	X	X		
Preparation of Progress Reports of the FPPP	Monthly	X	X		
Meetings of the Inter-ministry Committee	TBD				
Public Participation Workshops	TBD				
DDS/OAS Supervision Missions	Quarterly	X	X		
<b>Evaluation</b>					
Meetings of the SC	Twice a year	X	X		
Mid-Term Review (MTR)	Once (1 <sup>st</sup> quarter after mid-term)	X	X		
Final Evaluation (FE)	Once (upon completion)	X	X		
Project Implementation Review (PIR) to the GEF	Once a year	X	X	X	X

#### 2.4 M&E: Performance and Achievement Indicators, baseline values and means of verification

Performance and Achievement Indicators measure progress in the execution of Project activities, and include procurement and production of goods and services, works and infrastructure, and use of resources – human and monetary resources. They also include specific measurable goals.

These indicators are then used to monitor the progress of Project execution, and assess the achievement of its goals and specific outputs. They are also used to evaluate performance. A list of indicators, along with their baseline values, parameters to be measured and means of verification are found in Table #1, below. It is worth to note that these indicators may be reviewed during the execution of the Project, baseline values

may be adjusted, and new indicators and/or parameters may be added. The monitoring of these indicators is assisted by a Project Management Software, such as MicroSoft Project Management.

Table 2.: List of Performance and Achievement Indicators

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
<b>Project Purpose:</b> <i>To support the implementation of Phase I of the Framework Program, by formulating the Strategic Action Program (SAP) of the La Plata Basin and its supporting Transboundary Diagnostic Analysis (TDA,) and creating the institutional and legal framework, and technical capacity for the implementation of the long-term Framework Program</i>			
Inter-ministry planning mechanism	Formalization of Inter-ministry meetings Number of meetings Staff assigned to	Non 0 0	Decreases and other legal/admin instruments of creation of Inter-ministries Minutes of meetings Payroll of participating ministries and agencies Budget of participating ministries
Technical coordination for thematic issues	Thematic groups established in each country Staff assigned to Number of meetings and working sessions	Non 0 0	Payroll of participating institutions Minutes of meetings Technical proposals Budgets of participating institutions
Planning and management tools and instruments	TDA SAP	Mega-TDA FSAP	TDA and SAP Letters of endorsement
On-the-ground experience in pilot sites addressing pressing issues	Pilot projects Participating institutions Co-financing	0 0 0	Pilot projects reports Number of participating institutions, and cooperation agreements Budgets of participating institutions and financial reports
Government commitment and ownership/ <i>country-driven process</i>	Counterpart contributions Staff assigned to National Development Plans (NDP)	XXXX XXXX FSAP not included	Expenditures reports from the PMS Payroll of participating institutions NDP and National budgets (Financing Ministries)
Technical capacity	CIC Secretariat Technical Capacity (personnel and equipment) National Institutions Technical Capacity (personnel and equipment) Technical reports and publications	XXXX XXXX	CIC Secretariat payroll and equipment inventory National institutions payroll and equipment inventory Reports and publications
Financial commitment and support	Financing Plan Investment secured	FSAP XXXX from Italy FONPLATA and others	Letters of commitment National Budgets and NDP
<b>Component #1:</b> <i>Strengthening baseline-wide cooperation capacity</i>			

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
FSAP Management Structure	CIC Execution Technical Unit staffing and budget National Institutions staffing and budgets	XXXX XXXX	Payroll and budget of the CIC Secretariat Payroll and budget of the participating national institutions
Decision-making support system	Decision-making Support System outputs, queries and visits	CIC Secretariat Web site and GIS database	Outputs from the System Hits and visits to the site
Horizontal Cooperation	Experts roster Experts exchange Virtual fora Training courses: programs, participants and presenters Internships: participants and programs	Not available 0 0 0 0	Expert roster available at the FSAP Decision-making support system Minutes from technical meetings and missions Reports of virtual fora Reports of internship programs
Overarching conceptual framework and common legal and policy elements	Comparison of national legislation and identification of common grounds	Not available	Comparison report
<i>Promotion of Stakeholder Participation, Communication and Education</i>			
Public Participation in the formulation of the TDA and SAP	Number of workshops Number of people involved	N/A	Minutes of the workshops Institutional Mapping Database
Public Involvement in the execution of Demonstration Pilot Project	Number of participating institutions Number of beneficiaries Co-financing and counterpart contribution	N/A	Project documents and cooperation agreements Budgets and financial reports from the participating institutions
Public Involvement in the identification, design and execution of projects for the Fund to Promote Public Participation (FPPP)	Number of proposals Number of institutions involved in the proposals Number of projects awarded and completed Number of participating institutions Number of beneficiaries	N/A	Institutional Mapping Database Project documents and cooperation agreements

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
Communication and Dissemination	Tools and means People reached Hits and visits to the Program Web site	XXXX XXXX XXXX	Web site records and logs Distribution lists Publication records
Education and capacity development	Number of institutions involved per education level (primary, secondary, and university levels)	XXXX	
<b>Component #II: Integrating Water Resources Management</b>			
<i>Integrated Water Balance</i> Methodology UNESCO-IHP Integrated Water Balance	UNESCO publication on Methodology for Integrated Water Balance  Integrated Water Balance for la Plata Basin	0  0	UNESCO publication  Integrated Water Balance published by CIC and adopted by the countries
<i>Integrated Water Resource Management</i> <i>Water Quality and Contamination</i> Water Quality Monitoring Network Assessment of the Monitoring Network Contamination Sources Regulatory Framework	Network installation  Chemical determination and Network improvement plan  Database on contamination sources  Regulatory framework endorsements	0  0  0  0	Database and equipment in place and operating  Reports on sample exchanges and protocols and standards  Database on contamination sources outputs  Endorsement letters to the Regulatory Framework
<i>Integrated Management of Groundwater</i> Guideline book for Integrated Surface-groundwater Management Map of transboundary aquifers SAYTT SAP Proposal on groundwater for the la Plata SAP	Guideline book submitted to the CIC Map of transboundary aquifers SAYTT SAP Groundwater component for the la Plata SAP	0 0 0 0	Letters of endorsement and ratification of the Guideline book at the CIC Maps and GIS database of aquifers Letters of endorsement to the SAYTT SAP SAP w/ groundwater component and letters of endorsement
<i>Biodiversity Management</i> Harmonized Regional Strategy Environmental Management Plan Monitoring System for controlling the introduction of exotic ichthyic species Harmonized regulatory fishery measures	Harmonized Regional Strategy Environmental Management Plan Monitoring System Harmonized regulatory fishery measures	0 0 0 0	Letters of endorsement and CIC resolution on Harmonized Regional Strategy and Regulatory Fishery Environmental Management Plan Agreements signed by riparian countries

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
<p><i>Control of Land Degradation</i></p> <p>Soil base maps at Basin-wide scale</p> <p>Project design in a critical area of the Paranaense Forest</p> <p>Public awareness and education mechanism</p>	<p>Map library</p> <p>Project document for the Paranaense Forest</p> <p>Public awareness and education mechanism</p>	<p>0</p> <p>0</p> <p>0</p>	<p>Maps and GIS database</p> <p>Diagnostic on the Paranaense Forest and Pro doc</p> <p>Public awareness and education plan and endorsements</p>
<p><i>Identification of Sustainable Development Opportunities</i></p> <p>Projects on the use of clean technologies</p> <p>Projects on sustainable tourism</p>	<p>Identification and formulation of projects</p>	<p>0</p>	<p>Pro docs and letters of endorsement</p> <p>Letters of commitment for funding Investments</p>
<i>Implemented and replicable demonstrative pilot projects</i>			
<p>HYDROENVIRONMENTAL ALERT SYSTEM – FLOODS AND DROUGHTS IN THE CONFLUENCE AREA OF THE PARAGUAY AND PARANA RIVERS (ARGENTINA, BRAZIL AND PARAGUAY). Axis Resistencia-Corrientes ( Argentina) – Pilar (Paraguay)</p> <p>Binational Hydroenvironmental Alert System</p> <p>Community Contingency and Hydraulic Works Safety Plans</p> <p>Transboundary Water Alert Committee</p>	<p>Reduction of flooding and droughts damages measured in monetary values</p>	<p>Hydrological statistics on damages caused by flood and drought in the region</p>	<p>Alert system implemented</p> <p>Forecast models operating</p>
<p>WATER USE CONFLICTS – CUAREIM/QUARAÍ RIVER BASIN (BRAZIL AND URUGUAY)</p> <p>Formal Coordination mechanisms</p> <p>Binational Irrigation Boards</p> <p>Micro-hydraulic measures</p> <p>Flood and droughts contingency program</p>	<p>Number of water rights concessions vs. percentages of uncontrolled water use</p>	<p>Existing studies and proposal</p>	<p>Institutional reports and statistics</p>
<p>CONTROL OF CONTAMINATION AND EROSION IN THE PILCOMAYO RIVER BASIN (ARGENTINA, BOLIVIA AND PARAGUAY)</p> <p>Tasna Buen Retiro Tailings Dam Environmental Control and Mitigation Project</p> <p>Application of soil conservation practices</p> <p>Passive contamination</p> <p>Soil erosion and river sedimentation and filtering control practices</p>	<p>Number of properties adopting conservation practices.</p> <p>Hectares of reforested land</p>	<p>Existing reports and measures at Pilcomayo EU Project.</p>	<p>Reports and field inspections</p>

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
<p>BIODIVERSITY CONSERVATION IN A DAM AREA OF THE PARANA RIVER (ARGENTINA, BRAZIL AND PARAGUAY)</p> <p>Ichthyic biodiversity evaluation</p> <p>Socio-economic study</p> <p>Environmental Management Plan</p>	<p>Field campaigns</p> <p>N. of fisherman involved in the project</p> <p>Plan adopted</p>	<p>On going studies carried out by Itaipu and Yacyretá Dams</p>	<p>Income increase of the fishermen (measured in monetary values)</p> <p>Reports and publication</p>
<b>Component #III Adaptation to Climate Variability and Change</b>			
Observation System	<p>Hydro-meteorological and atmospheric measures</p> <p>Equipment installation and operation</p>	<p>XXXX</p> <p>XXXX</p>	<p>In-situ verification</p> <p>Spatial coverage. Official maps and databases</p> <p>Climate Change National Communications</p>
Weather Scenarios	<p>Number of countries that formulate scenarios and models</p> <p>Number of students and trained professionals</p>	<p>XXXX</p> <p>XXXX</p>	<p>Climate Change National Communications</p> <p>Official databases</p> <p>Curricula from universities</p>
Hydrological Models (Component IV)	Hydrodynamic models distribution and sub-basins coverage	<p>XXXX</p> <p>XXXX</p>	<p>Climate Change National Communications</p> <p>Official maps and databases</p>
Transboundary Contingency Plans	<p>Contingency plans adopted</p> <p>Communication plans adopted for various climate change scenarios</p> <p>Number of studies of current adaptation practices</p>	<p>0</p> <p>0</p> <p>0</p>	<p>Mass communication media. Media reports (written, audio-visual, radio and TV, etc.)</p> <p>Studies reports</p>
<b>Component #IV: Preparation of the Strategic Action Plan (SAP) and Transboundary Diagnostic Analysis (TDA)</b>			
Planning and management tools and instruments	<p>TDA</p> <p>SAP</p>	<p>Mega-TDA</p> <p>FSAP</p>	<p>TDA and SAP</p> <p>Letters of endorsement</p>
On-the-ground experience in pilot sites addressing pressing issues	<p>Pilot projects</p> <p>Participating institutions</p> <p>Co-financing</p>	<p>0</p> <p>0</p> <p>0</p>	<p>Pilot projects reports</p> <p>Number of participating institutions, and cooperation agreements</p> <p>Budgets of participating institutions and financial reports</p>
Government commitment and ownership/ country-driven process	<p>Counterpart contributions</p> <p>Staff assigned to National Development Plans (NDP)</p>	<p>XXXX</p> <p>XXXX</p> <p>FSAP not included</p>	<p>Expenditures reports from the PMS</p> <p>Payroll of participating institutions</p> <p>NDP and National budgets (Financing Ministries)</p>

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
Technical capacity	CIC Secretariat Technical Capacity (personnel and equipment) National Institutions Technical Capacity (personnel and equipment) Technical reports and publications	XXXX XXXX	CIC Secretariat payroll and equipment inventory National institutions payroll and equipment inventory Reports and publications
Financial commitment and support	Financing Plan Investment secured	FSAP XXXX from Italy FONPLATA and others	Letters of commitment National Budgets and NDP

Table 3 Project Process Indicators

Process Indicators	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
New signed agreements with CSO	5 signed agreements	5 signed agreements	5 signed agreements	-	-
Ad-hoc Assessment Committee established and functioning	1 meeting)	2 meetings (1 financed by SAP)	2 meetings (1 financed by SAP)	2 meetings (1 financed by SAP)	2 meetings (1 financed by SAP)
Number of CSO participating in the TDA and SAP	Number of key informant interviews for TDA	Number of participants in TDA national and regional meetings	Number of key informant interviews for SAP	Number of participants in SAP national and regional meetings	TDA and SAP documents validated by civil society
Prepared Communication Plan.	Brochures distributed. 1 SAP publication available. 1 Video and TV spot available. Database and communication links established.	5 articles disseminated to the press. 2 technical publications1 completed radio and TV campaign.	5 articles disseminated to the press. 2 technical publications. 1 completed radio and TV campaign	. 5 articles disseminated to the press. 2 technical publications. 1 completed campaign.	2 Documents of the Project published in Spanish, Portuguese and English, distributed in 5 countries
Courses delivered, Programs defined and Educational Materials prepared	Number of courses delivered, number of participants, length of time of delivered courses	Number of courses delivered, number of participants, length of time of delivered courses	Number of courses delivered, number of participants, length of time of delivered courses	Number of courses delivered, number of participants, length of time of delivered courses	Number of courses delivered, number of participants, length of time of delivered courses Fund for PPP established
Fund Regulation approved	2 calls performed With an estimate of 12 projects selected and agreements signed	Roughly 12 projects in execution	Roughly 12 projects in execution	Results from roughly 12 projects evaluated	Results incorporated into the SAP
6 local management committees established	6 local management committees working	6 local management committees working	6 local management Committees working	6 local management committees working	6 local management plans evaluated and conclusions included in the SAP



## 2.4 M&E: Process, Stress and Environmental Outcomes and Indicators

Table 4. Process Outcomes and Indicators

Process OUTCOMES		
Project	Catalytic for IWRM	Indicator
Multi-country agreement on transboundary priority concerns, impacts and causes	Moderate	<ul style="list-style-type: none"> <li>- Constitution of the Technical Counterpart (or technical group) of the CIC relating to the critical issues in the Basin, in support of the execution of the Project.</li> <li>- Inter-ministerial agreement of the agencies involved in each country to define the representation of the Technical Counterpart (or technical group) of the CIC.</li> </ul>
Multi-country agreement on governance reforms and investments to address priority transboundary concerns	Moderate	<ul style="list-style-type: none"> <li>- Inter-ministerial mechanism established at the national level to discuss and implement regional strategic actions defined in the Project.</li> </ul>
Effective national Inter-ministry Coordination	Moderate	<ul style="list-style-type: none"> <li>- National Unit of the Project is formalized at supra-ministerial level.</li> <li>- Inter-ministerial mechanism established at the national level to agree to the execution with the organization of the civil society and the academic sector.</li> </ul>
Stakeholder involvement in transboundary waterbody priority setting and strategic planning	Moderate	<ul style="list-style-type: none"> <li>- Increase awareness of and participation in the project activities through project developed and implemented.</li> <li>- Workshops and meetings with local authorities, institutions, and stakeholders. Participants from indigenous communities.</li> <li>- Preparation and wide dissemination of project-related documentation and project-related activities through the fund for civil society.</li> <li>- Stakeholders from the five counties participate in the formulation of the TDA and SAP by means of workshops and consultations throughout the project</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions	Moderate	<ul style="list-style-type: none"> <li>- Cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>- Institutional strengthening (training and equipment) provided to institutions related to the stakeholder organization, communication and education.</li> </ul>

Table 5. Stress Reduction Outcomes and Indicators

Stress Reduction OUTCOMES in Pilot Project (PP)		Stress Reduction INDICATORS (report vs. baseline if possible)
Project	Catalytic	Project
PP Biodiversity Reduction in the fishing stress rate due to implementation of the management plan Fishermen working in alternative activities during fishing preclusion periods	Moderate	Income increase of the fishermen measured in monetary values).
PP Forecasting System Reduction of risks associated to floods and droughts to lives and properties due to implementation of the alert system	High	Reduction of flooding and droughts damages measured in monetary values
PP Water Use Conflict Reduction of water use conflicts due to the implementation of Adequate IWRM	Low	Number of water rights concessions vs. percentages of uncontrolled water use

PP Mining Contamination Risk reduction for population and environment	High	Tasna Buen Retiro Tailings Dam rehabilitated. Number of properties adopting conservation practices. Hectares of reforested land.
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Table 6.Environmental/Water Resources Status Outcomes and Indicators

Environmental/Water Resources (& Socioeconomic) Status OUTCOMES for Pilot Project (PP)		Environmental/Water Resources (& Socioeconomic) Status INDICATORS
Project	Catalytic	Project
PP Biodiversity Environmental health and socio-economic wealth	Moderate	- Increasing aquatic biodiversity and population measured in number of species and population - Increase in fisherman incomes measured in monetary values
PP Forecasting System Environmental health and socio-economic wealth	High	- Better water quality control (measured by monitoring system) - Reduction of water induced diseases due to implementation of contingency plans, measured by hospital statistics
PP Water use conflicts Improved aquatic biodiversity (ecological flows) Stakeholders wellbeing	Low	- Reduction of waste water contamination due to the implementation of IWRM (measured by water quality parameters) - Reduction of conflict degree, measured by the degree of command and control intervention mechanisms and fines applied
PP Mining Contamination Environmental health	Moderate	- Control of erosion and downstream contamination, measured by sedimentation and water quality parameters (monitoring system)

## 2.5 Global Benefits

The la Plata River Basin, extending over some 3.1 million km<sup>2</sup>, is one of the largest river basins in the world. It includes almost all of the southern part of Brazil, the southeast part of Bolivia, a large part of Uruguay, the whole of Paraguay, and an extensive portion of the central and northern parts of Argentina. The importance of the Basin and its global priority has been highlighted in global studies such as the GEF/GIWA Project. The Basin's rivers drain approximately one-fifth of the South American continent. Annex 3 shows a Basin Map. Water and nutrients from the central regions of South America discharge through the la Plata river to the Southwest Atlantic Large Marine Ecosystem (LME).

The Basin is comprised of three large river systems; namely, the Paraná River, the Paraguay River, and the Uruguay River. The Paraguay River has an average annual flow of 3,800 m<sup>3</sup>/s (at Pilcomayo Harbour), the Parana River has an average annual flow of 17,100 m<sup>3</sup>/s (at Corrientes) and the Uruguay River has an average annual flow of 4,500 m<sup>3</sup>/s. These last two rivers come together to form the la Plata River, draining to the Atlantic Ocean, with an average output of 25,000 m<sup>3</sup>/s

A large wetland corridor links the Pantanal (in the headwaters of the Paraguay River) with the Delta del Parana, at its outlet to the la Plata River. This constitutes a river system with great biological diversity and productivity. The la Plata Basin also has important groundwater resources, which coincides with the Guaraní Aquifer System (1,190,000 km<sup>2</sup> in extent), one of the largest continental groundwater reservoirs in the world. The Yrenda-Toba-Tarijeño (SAYTT) Aquifer System is another potentially important groundwater resource, among others.

A published review of the World Resources Institute defined the la Plata River system as one of the most important river basins in the world, having a great number, variety, and degree of endemism in fish species (in the Paraguay River sub-basin), and the highest numbers of native birds (the Parana River sub-basin).

Mineral resources, forests, and soil fertility make the la Plata Basin an attractive population region and favor economic development, sustaining 70% of the five countries GDP. Present populations exceed 100 million people, with 57 cities having more than 100,000 inhabitants—including the five capital cities: Buenos Aires, Sucre, Brasília, Asunción, and Montevideo. The Argentine, Brazilian and Uruguayan economies, with a

strong agriculture-cattle component, show a significant level of industrial and service production, while Bolivia and Paraguay maintain an agriculturally-based economy.

This economic development demands communication and multimodal transportation systems, of which the hydrological systems are a fundamental element, interconnecting production, supply and consumption centers and harbors, from which products are exported to different countries. The City of San Paulo, one of the biggest cities and industrial concentrations in the world, is located on one of the Basin headwaters, tributary to the Parana River.

The extensive navigation system of the la Plata Basin is favored by regional commercial agreements. The Paraguay-Paraná Waterway increased the fluvial transport of goods from 700 thousands tons at the beginning of 1990 to 13,000,000 tons in 2004, due to lower costs relative to alternative transport means. In the near future, the goal is to reach 50 million tons.

The important hydrological potential of the Basin, estimated at 92 GW, has justified the construction of more than 150 dams, 72 of which exceed 10 MV. Three dams are binational: Itaipú (12.6 GW) and Yacyretá (3.1 GW) located on the Paraná River, and Salto Grande (1.89 GW) on the Uruguay River. 60% of the hydrological potential is already used. The interferences generated by these dams have determined substantial changes for species in the fluvial ecosystems. These interventions also incorporate a human factor: flow regulation coordinated through modeling processes. On the other hand, slight improvements in runoff foreseen in climate forecasts could offer—with a coordinated dam management—significant social, economic and environmental benefits.

The la Plata Basin is in a complex climate region, with important “gaps” in the available data, which generates uncertainties for the modeling of spatial, temporal and global interrelations. The climate is a determining factor for the heterogenic hydrological system. The relatively scarce rainfalls and high evaporation levels define the arid and semiarid zones to the west (Grand Chaco Americano), while strong rainfalls and runoff, due in part to deforestation, characterize northeastern zones. The great Pantanal wetland has a key role in the storage of runoff produced by rainfall in the Alto Paraguay River catchment, which delays for almost six months the maximum flows to the Parana River, avoiding downstream flooding. The economic and social impacts of flooding are very important. Available data for the last 20 years show that the floods on the Parana River are more frequent, intense and long lasting. The constant advance of urbanization and soil use changes are important reasons for this phenomenon, which also are certainly related to climate factors.

The la Plata Basin has one of the highest average sediment transport rates—of approximately 100 million tons/year in the Parana River (at Corrientes)—associated with soil loss, navigation problems, water quality deterioration and problems of infrastructure maintenance. Most solids come from the Bermejo River basin, tributary to the Paraguay River, where erosion control measures are being implemented. In the Alto Paraguay-Pantanal, there are significant wetland conservation problems related to increases in sedimentation. Another critical zone is the Gran Chaco, where soil degradation is the principal issue to be addressed in integrated water resources management.

The importance of the la Plata Basin water resources and the need to utilize and protect them enabled the signature of the Treaty of the la Plata Basin in 1969 by the five countries. This is the key legal instrument to advance sustainable economic development, with the CIC as the technical and institutional organization to manage and coordinate programs. On the other hand, the Treaty enables the countries “... to conclude specific or partial, bilateral or multilateral agreements to reach the Basin development objectives.” On this basis, more than twenty institutions or agencies have been created with direct responsibility to carry out water resources use and management.

During the 1970s and 1980s, the CIC, with OAS support, performed a complete water resources study of the la Plata Basin, particularly focused to the energy and transport areas. Some critical zones were identified, such as the Pilcomayo River and Bermejo River subbasins with their high sediment transport rates, and the Alto Paraguay-Pantanal subbasin, with its key role in hydrological regulation.

The global importance of the problems impelled different agencies -in particular the GEF- to finance different projects that allowed strengthening policies on integrated water resources management, biodiversity protection or soil degradation mitigation. However, these projects lack the capacity to visualize, identify and implement wider and more comprehensive actions with additional benefits for the countries sharing the La Plata Basin and the global environment.

## 2.6 M&E Responsibility Assignments

Table 7 provides a detail of responsibilities assignments for the different M&E tasks that conform the Plan.

Table 7. M&E Responsibility Assignments

M&E PLAN COMPONENT/ ACTIVITY	RESPONSIBILITY ASSIGNMENT		MEANS OF ASSESSMENT/ MONITORING DATA SOURCE
	INSTITUTION/ AGENCY	PROJECT/ AGENCY OFFICER	
<b>Monitoring</b>			
Preparation of the Project Implementation Plan (PIP), Work-plans and Time-tables, and budgets	GS/OAS EXECUTION COORDINATING UNIT	GS/OAS TASK MANAGER INTERNATIONAL COORDINATOR	PROJECT DOCUMENT RESOLUTIONS OF THE STEERING COMMITTEE MEETINGS
Preparation of Progress Reports	GS/OAS	GS/OAS TASK MANAGER	Execution Coordinating Unit's reports
Preparation of Expenditure Statements (including co-financing)	GS/OAS	GS/OAS TASK MANAGER	GS/OAS MIS (Oracle) and CIC Project Management System (PMS)
Preparation of counterpart contribution reports	NATIONAL PROGRAM UNITS (UNPs) EXECUTION COORDINATING UNIT	NATIONAL COORDINATORS INTERNATIONAL COORDINATOR	CIC Project Management System (PMS)
On-site supervision of Demo Projects and FPPP's projects	EXECUTION COORDINATING UNIT	NATIONAL COORDINATORS INTERNATIONAL COORDINATOR	On-site data collection
Preparation of Progress Reports of the Demo Projects & Studies	PARTICIPATING INSTITUTIONS	PROJECT MANAGER (of each Demo and FPPP projects)	Projects Management Systems
Preparation of Progress Reports of the FPPP	PARTICIPATING INSTITUTIONS	PROJECT MANAGER (of each Demo and FPPP projects)	Projects Management Systems
Meetings of the Inter-ministry Committee	UNPs (acting as Secretariat of the Inter-ministry Committees)	NATIONAL COORDINATOR	Minutes of the Meetings and documents of the Committees
Public Participation Workshops	UNPs EXECUTION COORDINATING UNIT	NATIONAL COORDINATORS INTERNATIONAL COORDINATOR	Minutes of the Meetings
DDS/OAS Supervision Missions	GS/OAS	GS/OAS TASK MANAGER	On-site data collection
<b>Evaluation</b>			
Meetings of the SC	EXECUTION COORDINATING UNIT (acting as Secretariat of the Committee)	PROGRAM DIRECTOR INTERNATIONAL COORDINATOR	Meetings of the SC

M&E PLAN COMPONENT/ ACTIVITY	RESPONSIBILITY ASSIGNMENT		MEANS OF ASSESSMENT/ MONITORING DATA SOURCE
	INSTITUTION/ AGENCY	PROJECT/ AGENCY OFFICER	
Mid-Term Review (MTR)	UNEP in consultation with GS/OAS, CIC Secretariat, UNPs, the Execution Coordinating Unit, and participating institutions and stakeholders	Independent consultant from the STAP roster	On-site data collection
Final Evaluation (FE)	UNEP in consultation with GS/OAS, CIC Secretariat, UNPs, the Execution Coordinating Unit, and participating institutions and stakeholders	Independent consultant from the STAP roster	On-site data collection
Project Implementation Review (PIR) to the GEF	UNEP with the assistance of GS/OAS	UNEP TASK MANAGER	On-site data collection

## 2.7 Budget:

### Financial Table of the GEF Budget

Concept	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1100 Management	0	0	0	0	0	0
1200 Consultant	22.000	2.000	37.000	2.000	37.000	100.000
1300 Administration	0	0	0	0	0	0
2200 Subcontracts with institutions	0	0	0	0	0	0
3200 Workshops and training	0	0	0	0	0	0
4100 Equipment and supplies	0	0	0	0	0	0
<b>TOTAL</b>	<b>22.000</b>	<b>2.000</b>	<b>37.000</b>	<b>2.000</b>	<b>37.000</b>	<b>100.000</b>

### Consultants to be hired for the project

Consultants Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
Local Technical Assistance			
Consultant 1	750	27	Design and implement the M&E System in the operation of the CIC
Consultant 2	750	15	Database support for the operation of the M&E System, under the CIC administrative officer.
Consultant 3	1500	50	Mid-Term Review (MTR) and Final Evaluation (FE)

See ToR in Annex 1.

### Activities of M&E included in the budget of other SubComponent

Activities	Included in budget of
<b>Monitoring</b>	
Preparation of the Project Implementation Plan (PIP), Work-plans and Time-tables, and budgets	I.1.1
Preparation of Progress Reports	I.1.1

Preparation of Expenditure Statements (including co-financing)	Project management
On-site supervision of Demo Projects and FPPP's projects	II.7
Preparation of Progress Reports of the Demo Projects & Studies	II.7
Preparation of Progress Reports of the FPPP	I.2
Meetings of the Inter-ministry Committee	Government Counterpart
Meetings of national coordination	Project management + Government Counterpart
Public Participation Workshops	I.2
DDS/OAS Supervision Missions	Project management
<b>Evaluation</b>	
Meetings of the SC	Project management
Project Implementation Review (PIR) to the GEF	UNEP

2.8 Timetable:

<b>Working Element</b>	<b>Activity</b>	<b>Activity Schedule</b>																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>II.1.1 Monitoring of progress</b>																					
<b>II.1.2 Evaluation of performance and achievement</b>																					

See details in "2.3 Activities - Tools and Timeline"

## ANNEXES

**Annex 1: Log frame** (see file: logframe\_12dec07.doc)

### Annex 2: Terms of Reference for Consultants

#### Consultant 1

**Objective:**

Design and implement the M&E System in the operation of the CIC

**Activities:**

The consultant shall have thorough knowledge of the project, both of its content and its implementation procedures. Also, the consultant must know the requirements of international agencies regarding the progress of projects for the purpose of being able to evaluate it and make any corrections if required. In function of the above, the consultant shall design the monitoring and evaluation procedure to be applied throughout the implementation phase of the project, which will constitute a tool for managing it.

**Results:**

M&E Plan, developed and implemented

**Duration:**

The duration for this task will be 3 months.

#### Consultant 2

**Objective:**

Database support for the operation of the M&E System, under the CIC administrative officer.

**Activities:**

The consultant should design and maintain the database that supports the M & E project, according to the plan developed in Consultation 1

**Results:**

Maintaining the database supporting the M&E system of the project.

**Duration:**

The duration for this task will be 54 months.

#### Consultant 3

**Objective:**

Development of a Mid-Term Review (MTR) and the development of the Final Evaluation (FE)

**Activities:**

As a function of the requirements of GEF and UNEP, the consultant will make mid-term and end of the project assessments. The consultant will prepare all of the information required for such assessments, as well as all the necessary materials, and will participate actively in such assessments.

**Results:**

Mid-Term Review (MTR) and Final Evaluation (FE) conducted correctly

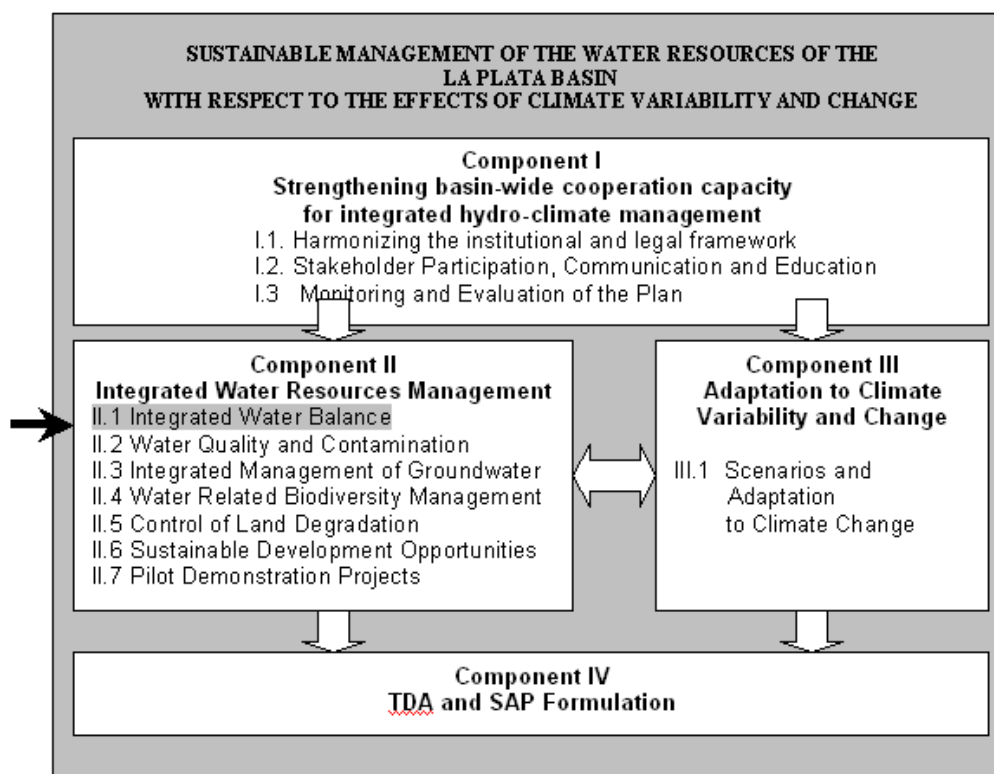
**Duration:**

The duration for the execution of this task will be for 12 months in two phases of 6 months each.

**SUBCOMPONENT**  
**II.1**  
**Integrated Water Balance for the La Plata Basin**

**Part 1: Project Identifiers**

1.1 Sub-project title: Integrated Water Balance for the La Plata Basin  
1.2 Link to umbrella project: Component II: Integrated Water Resources Management



1.3 Geographical scope: La Plata Basin  
1.4 Executing Agency/entity: CIC in cooperation with the following national institutions:  
Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.  
Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.  
Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).  
Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.  
Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).

1.5 Duration: 2 years  
1.6 Focal area(s): IW  
1.7 GEF grant: \$ 370,000  
1.8 Co-financing: \$1,233,525  
1.9 Total funding: \$1,603,525  
1.10 Associated financing: None  
1.11 Contact person: Miguel Angel López Arzamendia  
Title: CIC Secretary General and Project Director  
Tel: (54-11) 431 22 506  
Email: [secretaria@cicplata.org](mailto:secretaria@cicplata.org)



**1.12 Project summary:**

The objective of this subcomponent is to develop a Water Balance for the La Plata River as a support instrument for the integrated management of the water resources in the Basin. The water balance will comprise information encompassing the distribution, use and demand for water, and include the following elements: (1) the development of a comprehensive methodology for an integrated water balance, to be developed with the input of UNESCO-IHP; (2) the elaboration of the surface water balance, including an evaluation of resource supply and demand; and (3) the dissemination of results.

The output will comprise a dynamic information system that provides comprehensive, state-of-the-art data summarizing the overall water balance for the wider la Plata Basin. This information will in turn provide a critical baseline information tool to support a multi-country approach to integrated water resource management. The water balance will be among the first, comprehensive assessments ever established for the wider Basin area, and include, for example, quantified information concerning water supply and demand; assessments of the implications of changing demographic scenarios on supply, demand and contamination estimates; the implications of hydroelectric generation plans; changing agricultural production trends; as well as other socio-economic triggers, including transportation, recreation, industrial and commercial activities, municipal use and sewage discharge

**Summary Table of Subcomponent Work Elements, Outputs and Outcomes**

Work Element	Output	Outcome
II.1.1 IWB Methodology	Adopted an operational methodology for IWB.	With technical assistance from UNESCO-IHP, a methodology for LPB Integrated Water Balance, is recognized and accepted by the riparian countries
II.1.2 LPB IWB	Water balance for LPB	Supply and demand integrated water balance outputs, in a GIS format, identifies the availability of resources for developing recommendations and criteria for the adaptive and sustainable integrated water resources management
II.1.3 Dissemination	IWB information disseminated	Information, through multi-media sources, is disseminated and informs the public on the issues and the availability of basin water resources

**Summary Table of Subcomponents Work Elements, Funding Sources, and Costs**

Work Elements	Sources of funding				Total Cost (US\$)
	GEF Funding (US\$)		Co-financing (#) (US\$)		
II.1.1 IWB Methodology	\$90,000	4%	\$612,644	96%	\$702,644
II.1.2 LPB IWB	\$220,000	48%	\$250,000	52%	\$470,000
II.1.3 Dissemination	\$60,000	25%	\$370,881	75%	\$430,881
<b>TOTAL</b>	<b>\$370,000</b>	<b>18%</b>	<b>\$1,233,525</b>	<b>82%</b>	<b>1,603,525</b>

(#) Government Counterpart and Co-financing UNESCO will contribute with the methodology (Working Element II.1.1) and in the annual workshops costs of regional coordination for the WB. It is estimated its contribution "in kind" through the International Hydrological Programme for Latin America and Caribbean (PHI-LAC) will be US\$250,000.

## Part 2: Project design

### 2.1 Background and context:

**Background and introduction.** A policy challenge facing riparian countries involves adopting sustainable and integrated natural resources and water management practices in a harmonious and compatible manner. The impacts of multiple pressures, including demographic growth, poverty, changing types and scale of agricultural production, as well as the effects of climate variability and climate change on water resources, contribute to the critical challenges faced by decision makers. The combined effects of supply scarcity in certain areas, as well as increased contamination and other drivers, are posing fundamental challenges to current and future generations.

Techniques to evaluate integrated water balance (IWB) constitute but one of the means used to resolve practical and theoretical water problems. The emerging use of various techniques within IWB approaches enable policy-makers to utilize detailed quantitative, spatial and temporal evaluation of water resources. Indeed, the inter-disciplinary tools within the IWB approach provide water resource planners a rational tool to determine water balances, including control and distribution of scarce freshwater resources over time and spatial restrictions.

An assessment of a basin's water balance provides an important decision-making tool, particularly when it involves multiple stakeholders that share a wider basin. By clarifying the specific characteristics of a basin's hydrological cycle, the water balance is able to compare isolated water resources within a system and to estimate alterations to these resources as a result of the shorter-term effects of climate variation and longer-term effects of climate change. This robust, data-intensive decision-making tool contrasts with past approaches to the water resources management based on imperfect or incomplete information, political speculation and the absence of comparable data among countries that share important transboundary water basins. With its emphasis on establishing a data-intensive baseline, the IWB establishes a comparative reference point within which climate forecasting can be undertaken, whereby climate impacts can be determined in relation to probable hydrological effects. Given the critical objective of the project is to assess the effects of climate change on the LPB, the IWB approach will play a critical part within the overall parameters of the project.

The present activity will include a review and critical assessments of the existing projects and programs undertaken to date within the Framework Program for the integrated management of water resources of the La Plata Basin in Argentina, Brazil, Bolivia, Paraguay and Uruguay.

**Statement of Issues** The baseline TDA, conducted during the PDF-B process, enabled the identification of the principle risks and existing barriers to be overcome or mitigated within the LPB. Prior to the finalization of the Block B component, authorities within the basin lacked a wider, basin-wide 'vision' and detailed assessment, thereby allowing sectoral bias to replace a comprehensive approach. Moreover, there was an absence of information from existing meteorological stations in key regions of the Basin, which in turn limited authorities to identify the inherent connectivity of the different component waters of the wider LPB. In addition, as in many other regions of the world, the basin lacked a comprehensive assessment that links groundwater and surface water resource management strategies, and alignment of those strategies to critical management challenges such as drought, low water availability, or the method to weigh risk factors associated with the diminishing availability of water as a result of climate variability and climate change. This strategy requires, as a base study, an integrated evaluation of distribution, use and demand for water.

**2.2 subcomponent objective:** To develop a water balance, evaluating water supply and demand for the La Plata River as a support instrument for the integrated management of the water resources in the Basin, considering the distribution, quality, use and demand for water.

**2.3 Environmental benefits:** *Global Benefits:* Knowledge of the spatial and temporary distribution of water resources, together with awareness of use and demands for those resources, allows for the integral management of water in the basin and provide knowledge to better shape development and conservation policy. Within the integral basin management approach, the elaboration of a short and middle-term vision includes biodiversity preservation. Within the longer-term vision, the integrated management approach supported by data from the Water Balance includes data and management objectives designed to contribute

to the conservation and sustainable use of diverse ecological systems and services within the wider basin, and in particular those ecosystem services identified in various reports, including the Millennium Ecosystem Assessment, that are associated with watershed management within the basin.

*Local Beneficiaries:* The beneficiaries will be: populations and governments at their national, provincial and municipal levels, responsible for the use and control of water resources, including:

- Users of several sectors of surface and ground waters.
- Urban populations affected by floods.
- Agricultural producers affected by extreme events (droughts and floods).
- Technicians and individuals working in water resources and environmental areas.
- Scientists and researchers working with water resources and associated natural resources.
- Decision makers at national, provincial, state and departmental levels.

The development of information systems within the Water Balance will focus on identifying varying local water uses and localized water impacts, including the effects of climate variability and climate change at the local level, as well as demographic shifts and other such pressures. In particular, the Water Balance will be designed to enable local administrations at the State/Provincial levels to make informed management decisions related to risks of exploitation, natural disasters, and contamination of water bodies.

#### 2.4 Overall subcomponent Outcomes:

The outcome is a La Plata River water supply and demand integrated water balance instrument, to be used in support of adaptive integrated water resources management within the basin.

2.5. Consistency of the sub-project with national/regional priorities and plans: All the countries of the basin are moving forward with programs evaluating the distribution, use and demand for water, however, the majority of these efforts do not allow for integration between distinct sectors, or for regional integration. Various GEF projects in the Basin address the theme but are segmented in their aims and approaches.

2.6 Coordination and linkages to the umbrella project activities and other related activities in the basin: The current Subcomponent is one of the fundamental links of the IWRM of the Basin as it involves the execution of actions related to basic information on the evaluation of available needs and resources. It assures the linkages to the umbrella Component II.

2.7 Incremental reasoning: discussion of the value added by the GEF involvement in this sub-project demonstrated through incremental reasoning

Baseline The countries of Argentina, Bolivia and Paraguay conducted a surface Water Balance in the 80's. Uruguay has a Water surface balance last updated in 2001. Brazil completed a preliminary Integrated Water Balance under the Water Assessment Program of the International Hydrological Program (IHP) of UNESCO.

Increment The project contributes to increasing the objectives set forth by the five signatory countries to the La Plata Basin Treaty--Argentina, Bolivia, Brazil, Paraguay and Uruguay—through the coordination of actions and investment in the La Plata Basin for the sustainable management of its water resources. The increment will be: assembling, analyzing, and synthesizing the country-level information into an agreed upon regional level using a common framework.

Incremental reasoning. Taking a regional approach to the action plan for defining the water balance at the basin level has been shown to be a much more effective approach in comparison to undertaking such actions on an individual or national basin level.

## 2.8 Working Element - Activities – Output

Subcomponent & Work Element Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>II.1</b> La Plata River water supply and demand, integrated water balance (IWB) instrument, in support of adaptive integrated water resources management in the Basin	1. Fully developed IWB methodology by the end of the 1 <sup>st</sup> year.	IWB UNESCO-IHP methodology	River basin IWB methodology is recognized and accepted by the riparian countries of the CIC, by the end of the 1st semester of Year 2.	IWB methodology adopted and operational and used for TDA and SAP preparation.
	2. Regional information bank	Various national, basin-wide, and GEF-project data sources	Various data sources identified, aggregated, and harmonized by the end of the 1 <sup>st</sup> year	LPB IWB defined and information disseminated and used by the end of year 3.
	3. Institutions and media sources	Various national, basin-wide, and GEF-project data sources	IWB process and preliminary findings reported and disseminated, by the end of year 2.	LPB IWB defined and used for TDA and SAP preparation by the end of the Project
With technical assistance from UNESCO-IHP, a methodology for LPB Integrated Water Balance that is recognized and accepted by the riparian countries	Dynamic Methodological Guide	IWB UNESCO-IHP methodology	Dynamic Methodological Guide endorsed by the five countries of the CIC, by the end of the 1st semester of Year 2.	IWB methodological guide used by national water management institutions at national and sub-national levels by end of project.
IWB supply and demand output, in GIS format (Sc. 1:100.000), identifying the availability of resources, to be used for the formulation of recommendations and criteria for sustainable integrated water resources management	Integrated Water Balance available in GIS Format (Sc. 1:100.000)	Various national, basin-wide, and GEF-project data sources	Various data sources identified, aggregated, and harmonized in GIS format by the end of the 1 <sup>st</sup> year	LPB IWB GIS output defined and used for TDA and SAP preparation by the end of the Project
Information disseminated through multi-media sources to inform the public on the issues related to the availability of the basin's water resources	Documentation of all IWB activities and products, disseminated to governmental actors, academics, and the population in general.	Various national, basin-wide, and GEF-project data sources	IWB process and preliminary findings disseminated using reports and the Project's Web Page and links, by the end of year 2.	Project LPB IWB defined and information disseminated using reports and the Project's Web Page and links by the end of the project.

## II.1.1 Operational methodology for integrated water balance

**Objective:** Standardization of the methodology for evaluating the IWB of the LPB

**Outcomes:** With technical assistance from UNESCO-IHP, a methodology for LRB Integrated Water Balance, is recognized and accepted by the riparian countries

**Output:** Adopted an operational methodology for IWB

**Activities**

- a) Develop a water balance methodology
- b) Agree to and adopt integrated water resources methodology

Outputs & Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output: Adopted an operational methodology for IWB	A methodology	IWB UNESCO-IHP methodology	LPB IWB methodology established is recognized and accepted at the CIC by the riparian countries, by the end of the 1st semester of Year 2.	IWB methodology adopted and operational (excluding groundwater resources) by the end of the 3 <sup>rd</sup> year
<b>a) Develop water Balance Methodology</b>				
▪ Utilize UNESCO-IHP			IWB methodology for the LPB	
<b>b) Agree to and adopt methodology</b>				
<ul style="list-style-type: none"> <li>▪ Document endorsing the National Water Balance.</li> <li>▪ Integration of the members of the GCR in the discussion of the methodology of for the IWB.</li> <li>▪ Training of professionals and technicians in the participating institutions in the IWB</li> </ul>			Final Document of the Dynamic Methodological Guide endorsed, at the CIC, by the representatives of the countries of the LPB	

## II.1.2 Water balance for LPB

**Objective:** Develop the evaluation of the components of the LPB Water Balance.

**Outcomes:** Supply and demand integrated water balance outputs, in a GIS format, identifies the availability of resources for developing recommendations and criteria for the sustainable integrated water resources management

**Outputs:** Integrated Water Balance for LPB

**Activities:**

- a) Compile information and generate database
- b) Develop capacity for understanding LPB's water balance
- c) Calculate Phase 1: surface water balance
- d) Asses water use and demand

Outputs & Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Output II.1.2:</b> Integrated Water Balance for LPB	Regional Information Bank	Various national, basin-wide, and GEF-project data sources	Different data sources identified harmonized, and data aggregated, by the end of the 1 <sup>st</sup> year Approximately 30 national and sub-national institutions of the LPB trained in IWM, by the end of year 2.	LPB IWB defined and information disseminated and used by the end of year 3. Approximately 30 national and sub-national staff from national and sub-national institutions of the LPB participate in the TDA and SAP preparation. by the end of the Project.
<b>a) Compile information and generate database</b>				

Outputs & Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<ul style="list-style-type: none"> <li>▪ Generate a database</li> <li>▪ Develop a Geographic Information System (GIS) for the LPB</li> <li>▪ Establish an Information Bank</li> </ul>				<ul style="list-style-type: none"> <li>- List of national and regional institutions, and GEF IW projects that possess information/data for the IWB</li> <li>- Protocol for the exchange of information and data among the participating institutions</li> <li>- Establishment of a regional database for the LPB</li> <li>- Operation of a database for the territories of the La Plata Basin.</li> <li>- A dynamic GIS that integrates data / variables for the IWB</li> <li>- List of institutions at regional and national level possessing relevant information for the IWB.</li> <li>- Institutional protocol(s) to contribute and/or link to reports and/or relevant documentation for the IWB.</li> <li>- Establishment of a Regional Information Bank for the LPB.</li> </ul>
<b>b) Develop capacity for understanding LPB's water balance</b>				
<ul style="list-style-type: none"> <li>▪ Complementary Measures</li> <li>▪ Investigation</li> <li>▪ Capacity developments</li> </ul>				<ul style="list-style-type: none"> <li>- Data aggregation, validation of methodologies, creation and strengthening of capacities.</li> <li>- Complement existent information by means of mediations/non systematic observations to verify and support estimations/evaluations/projections of one or more components of the IWB.</li> <li>- Evapotranspiration data for the LPB.</li> <li>- Procedures to estimate consumption/demand of water by type of use.</li> <li>- Qualified professionals able to apply the methodologies used for the IWB</li> </ul>
<b>c) Calculate Phase 1: surface water balance</b>				
<ul style="list-style-type: none"> <li>▪ Surface water hydrological balance (1971-2000)</li> </ul> <p>Groundwater hydrological balance (countries advances stages)</p> <p>Integrated surface and groundwater balance (as much as the available information allows)</p>				<ul style="list-style-type: none"> <li>- To arrange information in GIS format.</li> <li>- Dissemination of the use of the methodology.</li> <li>- Training of professionals.</li> <li>- Tables with variables integrating the WB by sub-basin.</li> <li>- Tables and Maps of the components of the HB for the LPB and a document of the HB.</li> <li>- Evaluation of Surface water offer.</li> </ul>
<b>d) Asses water use and demand</b>				
<ul style="list-style-type: none"> <li>▪ Classification of information</li> <li>▪ Environmental use, ecological flow</li> <li>▪ Use and demand determination</li> </ul>				<p>Catalogued inventory of different uses of water by province/state (for the non registered consumptive use cases an estimation will be made based upon the methodology adopted).</p> <p>Document recommending definition of ecological flows.</p> <ul style="list-style-type: none"> <li>- Inventory of uses and demands by country.</li> <li>- Distribution maps of water use by type (minimum 4: domestic, industrial, agricultural, livestock).</li> <li>- Projections of future demands.</li> </ul>

## II.1.3 Information dissemination

**Objective:** Dissemination of the information of the IWB of the LPB.

**Outcome:** Information, through multi-media sources, is disseminated and informs the public on the issues and the availability of basin water resources

**Output:** IWB information dissemination

**Activities** a) Disseminate water balance information

World Element Outputs & Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output II.1.3 IWB information dissemination	Documentation of all IWB activities and products, disseminated to governmental actors, academics, and the population in general.	Various national, basin-wide, and GEF-project data sources	IWB process and preliminary findings compiled and information disseminated using reports and the Project's Web Page and links, by the end of year 2.	Project LPB IWB' information and products disseminated using reports and the Project' Web Page and links, by the end the Project. All NGO and CSO personnel participating in TDA and SAP preparation understand LPB IWB.
<b>a) Disseminate water balance information</b>				
<ul style="list-style-type: none"> <li>▪ Freely distribute and disseminate water balance information brochures specifically regarding the project</li> <li>• Dissemination through the media (brochures and reports, project Web page, IWRN Node and IW-Lern).</li> <li>• Days spent distributing material at training centers, universities or other similar institutions</li> <li>▪ Days of outreach to authorities to be identified</li> <li>▪ Number of hits recorded on the project website</li> </ul>				

## 2.10 Budget:

## Co-financing

Sources of Co-financing	Type of Co-financing	Amount
Government Contribution	In-Kind	\$ 983,525
<b>UNESCO – IHP</b> (II.1 –Integrated Water Balance)	In-Kind	\$250.000

## Financial Table of the GEF Budget

Concept by Element	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200 Consultant	\$60,000	\$60,000	\$0	\$0	\$0	\$120,000
2200 Subcontracts with institutions	\$0	\$110,000	\$110,000	\$0	\$0	\$220,000
3200 Workshops and training	\$0	\$0	\$0	\$0	\$0	\$0
4100 Equipment and supplies	\$0	\$15,000	\$15,000	\$0	\$0	\$30,000
<b>Total</b>	<b>35,077</b>	<b>141,615</b>	<b>141,615</b>	<b>35,077</b>	<b>16,615</b>	<b>370,000</b>

## Consultants to be hired for the project

Consultants Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
<b>Local Technical Assistance</b>			
Consultant 1	750	96	Adapting the method of work, the dissemination and monitoring of the work, in coordination with the countries. Training in the application of the methodology

Consultants Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
Consultant 2	750	64	Development and application of a Geographical Information System approved by the BHII.

See ToR in Annex 1.

#### Sub contracts with institutions to be hired for the project

Sub contracts	Tasks to be performed	Amount
Subcontract 1: Total: 5 different subcontracts, one per country	Realization of an IWB using the defined methodology and the training.	\$220.000

#### 2.11 Timetable:

Working Element	Activity	Activity Schedule																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
II.1.1	Methodology for integrated water balance																				
II.1.2	Water balance for LPB, including evaluation of resource supply and demand																				
II.1.3	Dissemination																				

**2.12 Cost effectiveness** The technical benefits from this subcomponent of the project will entail an analysis at the basin level of its Water balance, to be used as the key information baseline in support of integrated water management approaches. The joint analysis comprising the five countries of the wider basin allows the region to address, in a coordinated and comprehensive manner, regional asymmetries in information, technical skills, etc, in a way that identifies potential benefits through lower cost interventions. The process towards the completion of the Water Balance will serve as a template for training, whereby the implementation of this program will serve as an example for replication.

#### 2.13 Risk Analysis

Risk	Rating (L/M/H)	Risk Mitigation Measures
Representativeness and proper functioning between National Units of the project and PHI-UNESCO focal point.	M	Strengthening the operational units of PHI with national institutions
The information base is inadequate for obtaining reliable results	M	Incentives the countries to improve information gathering by working together.

**2.14 Sustainability:** Project activities and implementation are designed (including the public involvement and stakeholder participation processes) to achieve sustainability. All of the activities form the foundation of multi-sector, multi-institutional, and basin-wide arrangements for the implementation of the monitoring system. The project will be carried out by relevant government agencies, and will strengthen the existing institutional and human capacities. The networks will be integrated at an agreed upon regional level using a common framework, which maintains national responsibility for executing the action plan established for this stage.



**2.15 Replicability:** The results of the Project will be disseminated through governmental institutions, nongovernmental organizations, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including the institutions related thereto in each of the five countries, will permit the development of information transfer mechanisms to share new knowledge and provide for active coordination and horizontal cooperation in the integrated management of the water resources of the Basin. All of the proposed activities are multifaceted in nature and include a strong element of multi-stakeholder participation. This will contribute to the “buy-in” of the project constituencies. The prospects for replicating such activities are high and can be achieved with minimal efforts by exchanging relevant information and experience learned.

**2.16 Execution arrangement:** Water resources management organizations, national institutions of each country, universities, and the UNESCO-IHP focal points will elaborate national water balances within the framework of this element.

**2.17 Public participation mechanisms:** Support of meaningful public participation is shown to help strengthen the overall governance of integrated water resource management projects, and this component of the project will support public participation and seek public input in the preparation of the Water balance. Promoting public participation in this project is integral throughout all of its components, to include input from the public and private sectors, including federal, sub-federal (State/Provincial) and municipal authorities, academics and universities, NGOs, private companies and organized groups within civil society — with a special focus on gender equity and indigenous peoples. This involvement will seek public input regarding different aspects of social sustainability of the action plan during both its formulation and implementation, including the consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

**2.18 M&E:** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback for decision makers to enable any necessary project modification in a timely manner (adaptive management).

#### PROCESS OUTCOMES AND INDICATORS

Process OUTCOMES		Process INDICATORS	
Project		Project	
Multi-country agreement on transboundary priority concerns, impact and cause			- Development and adoption of a methodology with the technical assistance of UNESCO-IHP by the end of the year 1 Water Balance of the la Plata River Basin, considering the demand-supply balance, by the end of the year 2.
Multi-country agreement on governance reforms and investment to address priority transboundary concerns			- Constitution of the Technical Group of the CIC relating to Water Balance as an advisory committee for the execution of the Sub-Component. 2 months after the beginning of the Project. - Reports and minutes of meetings.
Effective national Inter-ministry Coordination			- Inter-ministerial mechanism established at the national level to agree to the execution of the LPB IWB (national group), by month 4 - Inter-ministerial agreement of the agencies involved in each country to define the representation of the Technical Group of the CIC concerning water balance, by month 6. - Reports and minutes of meetings of the national groups.
Stakeholder involvement			‘ Increase awareness of and participation in Water Balance project activities through 5 workshops and additional working meetings with local authorities, institutions, and stakeholders. ‘ Preparation and wide dissemination of project-related documentation and project-related activities through the fund for civil society (PPF.)

Process OUTCOMES			Process INDICATORS
Project			Project
Newly established and/or strengthened (existing) transboundary waters institutions			<ul style="list-style-type: none"> <li>- Cooperation agreements signed between CIC and 5 government institutions, 6 international agencies (UNESCO, ITAIPÜ, Yacireta, Salto Grande, COBINABE, CARU) and an estimated 15 Public and Private Universities, academic institutions, and civil society organizations by the end of year 1.</li> <li>- Institutional strengthening (training) provided to institutions related to the IWB.</li> </ul>

## ANNEXES

### Annex 1: Terms of Reference for all consultants and Personnel to be hired under this sub-project

#### Consultation 1

**Objective:**

Strategy for the implementation of the work methodology for the accomplishment of the Integrated Water Balance in the La Plata Basin

**Activities:**

The consultant must have a thorough knowledge of the methodology of PHI (International Hydrological Program) to accomplish the Integrated Water Balance (IWB) in the Basin.

The consultant must prepare a strategy for dissemination and training of technicians from the countries in the use of this methodology.

The consultant must train at least 2 people per country.

Follow-up to the tasks that are performed in each country.

**Results:**

Prepared technicians who are able to apply the methodology, materials for dissemination and monitor activities in each country

**Duration:**

The duration for the tasks of this consultation is 24 months

#### Consultation 2

**Objective:**

Development and application of a Geographic Information System, in support of the IWB.

**Activities:**

Define the Geographic information system to be used.

Define the strategy for its implementation in the Basin

Implement the information system

**Results:**

Geographic Information System, implemented and

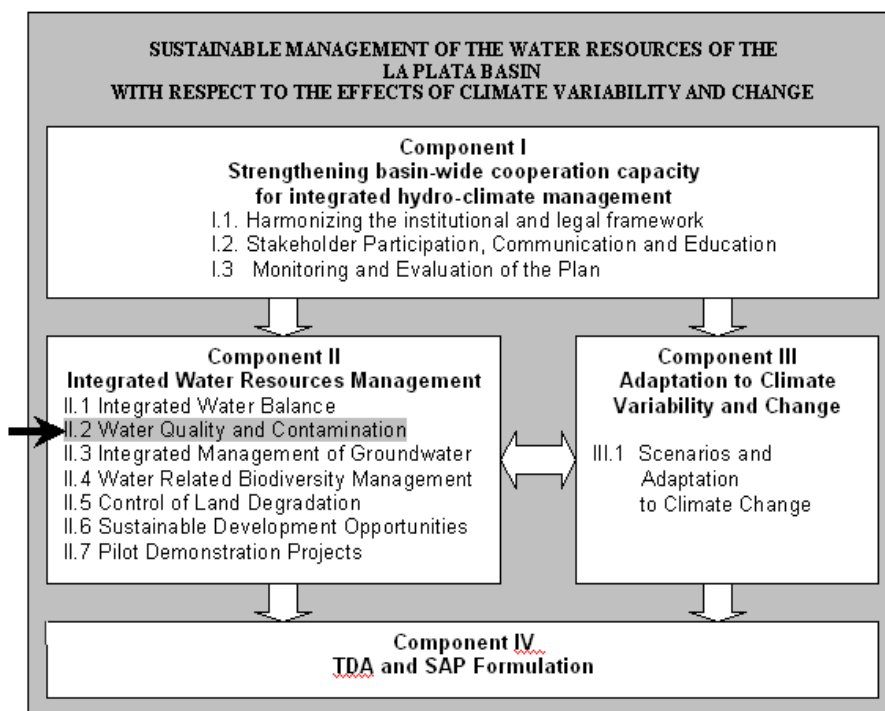
**Duration:**

The duration for this task is 24 months.

**SUBCOMPONENT**  
**II.2**  
**Water Quality and Contamination – Assessment and Monitoring**

**Part 1: Project Identifiers**

- 1.1 Sub-project title: Water Quality and Contamination - Evaluation and Monitoring  
 1.2 Link to umbrella project: Component II: Integrated Water Resources Management



- 1.3 Geographical scope: La Plata Basin  
 1.4 Executing Agency/entity: CIC in cooperation with the following national institutions:  
 Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.  
 Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.  
 Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).  
 Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.  
 Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).  
 1.5 Duration: 5 years  
 1.6 Focal area(s): IW  
 1.7 GEF grant: \$1,391,500  
 1.8 Co-financing: \$1,567,321  
 1.9 Total funding: \$2,958,821  
 1.10 Associated financing: None  
 1.11 Contact person:

Miguel Angel López Arzamendia  
 Title: CIC Secretary General and Project Director  
 Tel: (54-11) 431 22 506  
 Email: [secretaria@cicplata.org](mailto:secretaria@cicplata.org)

### 1.12 Project summary:

The objective is to cooperate with the national institutions responsible for water quality and contamination monitoring to develop a regional knowledge base within the framework of the CIC, and to establish a common set of parameters and a protocol for the monitoring of water quality. This Subcomponent will include the following three principal working elements: (II.2.1) Information, (II.2.2) Generation of Capacities and analysis of the information and (II.2.3) Plan of Action. The results are as follows: A water quality baseline for the Basin and a protocol for monitoring; A water quality-monitoring network based on existing and strengthened national monitoring networks, and communication protocols for the main transboundary water bodies and courses; An inventory of contamination sources available in a database; Data gap analysis in critical areas for the formulation of future scenarios, based on the application of existing mathematical models; and completed contingency management plans, support structures, and technical information for the development of common policies on water quality, and equipping of stations and personnel.

**Summary Table of Subcomponent Work Elements, Outputs and Outcomes**

Work Elements	Output	Outcome
II.2.1. Information	Water quality information base	Trained staff; Information available to assess water quality and actions to mitigate pollution sources
II.2.2. Model	Environmental degradation model	LPB environmental degradation model operational with forecasting capability
II.2.3. Action plan	Water Quality Action Plan	Trained staff contribute to preparing the water quality action plan

**Summary Table of Subcomponents Work Elements, Funding Sources, and Costs**

Work Element	Sources of funding				Total Cost (US\$)
	GEF Funding (US\$)		Co-financing (US\$)		
II.2.1. Information	\$875,750	40%	\$ 1,367,321	60%	\$ 2,243,071
II.2.2. Model	\$98,500	100%	0	0%	\$98,500
II.2.3. Action plan	\$417,250	75%	\$200,000	25%	\$617,250
<b>TOTAL</b>	<b>\$1,391,500</b>	<b>45%</b>	<b>\$ 1,567,321</b>	<b>55%</b>	<b>\$ 2,958,821</b>

## Part 2: Project design

### 2.1 Background and context:

Background and introduction. The natural resources of the La Plata Basin are of vital importance both from a strategic-environmental perspective as well as for the social and economic development of the region. Nevertheless, the interest and the technical capacity to study and preserve resources and their link to development have varied through the years and among the diverse subregions and subbasins.

Water quality is an essential element for effective environmental management and regional development. Interconnectivity between the sectors that use water resources in environmental protection is a priority in order to establish fair use of transboundary water resources.

The initiative to construct a water quality-monitoring network for the La Plata Basin began in 1986. Since then, the primary effort has been to ensure that it is perpetually maintained. Therefore, to achieve this end, it is necessary to reach a minimum level of shared capabilities among the member States of the La Plata Basin Treaty. To be more precise, in order to have a high quality database at the disposal of the countries in the region, the entire region must be committed.

The Water Quality Monitoring Network for the La Plata Basin, which this document proposes to build and implement, is a basic network serving to monitor the transboundary waters of the main rivers of the La Plata Basin—Paraná, Paraguay, Uruguay, Red and Pilcomayo.

In developing a water quality monitoring network for the La Plata Basin and an inventory of contamination sources, this document takes advantage of the technical advances and the enriched information that has come from the increased cooperation among the five countries involved. Likewise, this document indicates the important role that the lack of basic clean-up plays in the deterioration of the water quality in the basin, and the need to define a plan of action to mitigate contamination sources throughout the La Plata Basin.

Statement of Issues A critical and emerging issue in the Basin is water quality degradation. Water quality degradation, which has the potential to reduce the utility of its waters, can be traced to organic and chemical contaminants derived from mining and industrial activities without adequate treatment, sewage water discharges and diffuse contamination mainly from agriculture activities with intensive agrochemical use. Because of increasing pressure upon natural resources, current development trends indicate that a water quality monitoring system is needed. In addition, lack of common or shared standards and instrumentation to determine quality parameters, and limited control and monitoring networks in the five countries, have not allowed for a coherent and comprehensive water quality diagnostic. This diagnostic is required in order to better assess the causes and effects of transboundary environmental issues, and design strategies and identify measures to address them.

In addition, the process whereby sediments are generated and transported throughout the Basin must be better understood. Sedimentation affects navigable waterways and harbors, dams and reservoirs, degrades water quality, and leads to high maintenance costs. Sedimentation arises from increases in human-induced erosion and human-induced land degradation due to land use changes and deforestation. This threatens not only the human use of the waters of the La Plata Basin but also the overall functionality of the Basin's many ecosystems. The transboundary issue plays a particularly important role in light of the fact that sediments are both generated and deposited along shared water boundaries. As such, resolutions can only be advanced through a multi-lateral focus.

2.2 Subcomponent objective: The objective is to cooperate with the national institutions responsible for water quality and contamination monitoring to develop a regional knowledge base within the framework of the CIC, and to establish a common set of parameters and a protocol for the monitoring of water quality. This subcomponent will include the following three principle activities: (a) information, (b) generating capacities and an environmental degradation model and (c) an Action Plan. These activities have as their objectives: strengthening existing monitoring systems (including the ones developed under GEF projects) and implementing shared databases and operational plans; capacity building and network optimization plans; elaborating contamination source inventories, analytical protocols and assessment forms, discharge databases, sewage treatment rules and permitting systems, protocols, and control of contamination in shared rivers; applying existing mathematical models in the La Plata Basin, and implementing and identifying data needs in critical areas for the formulation of future scenarios; preparing a proposed legal framework for water quality assessments in shared rivers; and capacity building programs with workshops, seminars and courses, together with professional exchanges among the different responsible organizations, joint field work and intercalibration programs for participating laboratories.

2.3 Environmental benefits: The improvement in water quality in the basin. This will: a) improve the conditions for the recovery and maintenance of the aquatic biodiversity, and b) reduce the costs of water treatment for human consumption and the development of recreation activities, which, in turn, will have a direct and positive impact on tourism.

2.4 Overall subcomponent Outcomes: Through the regional water quality knowledge base, institutions responsible for water quality monitoring, agree to a protocol and remedial actions

2.5. Consistency of the sub-project with national/regional priorities and plans: All the countries of the basin are moving forward with programs investing in the provision of potable drinking water for their population, as well as programs improving the services of sewer system. Likewise, all the countries are working to improve the living conditions of the impoverished sectors of their populations, with high water quality being a key factor.

In cases when International Agencies participated in the Basin with specific mandates aligned with the proposed activities of this project, implementation agreements were reached with those agencies.

2.6 Coordination and linkages to the umbrella project activities and other related activities in the basin: The current Subcomponent is one of the fundamental links of the IWRM of the Basin as it involves the execution of actions related to one of the critical transboundary themes. Specifically, it ensures the linkages to the umbrella Component II. The coordination of this subcomponent will be under the supervision of the International Coordinator and will be linked directly to the development of the TDA and SAP.

#### **Other related activities in the basin**

- PEA-BERMEJO – Contributes through the generation of information and the plan to improve water quality and environmental information in the Bermejo River Basin.
- CARU – Contributes through generating water quality information for the main monitoring stations that operated on the Uruguay River in conjunction with the Project.
- FREPLATA – Contributes through water quality and contamination related information generated in the La Plata River, together with the cities of the coastal regions of Argentina and Uruguay as well as with the Naval Prefecture and the businesses involved in water clean-up and supply.
- Ecological Monitoring of the La Plata basin Project – Project coordinated through the CIC and developed with CARU and FREPLATA.
- PANTANAL – Availability of the results in the Alto Paraguay basin, distribution of the lessons learned, cartographic information, and the thematic maps.
- Tri-national Commission of Pilcomayo / Integrated Management Project and Master Plan of the Río Pilcomayo Basin – Monitoring of the water quality in the Río Pilcomayo Basin – 2006/2007.
- Cooperation for the transfer of technology, signed between JICA y SEAM/SENASA of the Republic of Paraguay, for the monitoring of the water quality in the Paraguay River until 2006.

2.7 Incremental reasoning: discuss the value added of the GEF involvement in this sub-project demonstrated through incremental reasoning

Baseline Water quality degradation has been shown to restrict the availability of water for a number of economic purposes, and to cause, *inter alia*, loss of biodiversity, ecosystem change and public health concerns. In this sense, each country develops projects on a national level to advance water quality monitoring with regard to the level of contamination. It should be known that: (i) Argentina manages stations operated by provinces and by binational and trinational groups. There is no operation coordinated from the national level. (ii) Bolivia does not possess an operative network for water quality in the region designated as the La Plata Basin. (iii) Brazil possesses an operative network of monitoring water quality coordinated on a national level with the *National Water Agency* and with support of state and federal institutions, taking an average of six parameters per station. (iv) Paraguay does not possess an operative, nationally coordinated monitoring network for water quality within its territory. (v) Uruguay does not possess a monitoring network for water quality on a national level but utilizes the information from the binational groups and the information provided by Brazil along the border points. There is no common plan for joint review of the information pertaining to water quality and the contamination of the La Plata Basin. The countries instead work in an isolated matter. However, the necessity to implement a coordinated program to monitor water quality and contamination has been discussed by the states as part of the Treaty of the La Plata Basin throughout the history of the CIC. As in the case of the previous Framework Program, a Methodological Guide was created as a result of the work realized within the framework of the CIC for technical counterparts as was fortunately laid out by the countries. During the development of the PDF-B, the Methodological Guide was prepared revised and completed and included, in Annex 4 (in Spanish) of this Subcomponent document.

Increment The project contributes to a higher objective set forth by the five signatory countries to the La Plata Basin Treaty--Argentina, Bolivia, Brazil, Paraguay and Uruguay--as coordination of actions and investment in the La Plata Basin for the sustainable management of its water resources, in particular those related to the assessing and monitoring of water quality and contamination. The increment will be:

assembling, analyzing, and synthesizing the country-level information into an agreed regional level using a common framework. The global benefit of this project is an improvement in the water quality of the river basin, which in itself implies an improvement in the quality of life for the inhabitants and the protection of the rich biodiversity, which exists in this important world reserve.

Incremental reasoning The participation of the GEF in this subcomponent implies the commitment of the five countries of the La Plata Basin to work together in coordinated tasks, controlling common parameters and employing the same protocols, increasing the database and providing free access to all the countries of the Basin. Taking a regional approach to the action plan for monitoring water quality at basin level has been shown to be much more effective approach when compared to similar actions undertaken at the individual or national basin level.

#### 2.8. Working Element – Activities - Outputs – Outcome:

Sub-component Objective & outcomes	Description of output indicator	Baseline level	Mid-term target	End-of-project target
<b>Objective</b> The objective is to cooperate with the national institutions responsible for water quality (WQ) and contamination monitoring, to develop a regional knowledge base for the LPB within the framework of the CIC, and to establish a common set of parameters and a protocol for monitoring WQ and identification of remedial actions for WQ protection in LPB.	Data entered into the LPB water database using all information available. This includes, inter alia, the results of 20 WQ campaigns (5 years, 40 selected stations, covering 5 majors rivers of LPB)	National and GEF project water databases	WQ network established and equipped by the end of year 1. 50% of the WQ campaigns completed.	-100% completion of the database, including diffuse rural sources of contaminants. - Operating network for LPB WQ monitoring, coordinated by the CIC.
	Models in operation and personnel qualified to operate them	- Uncoordinated national and sub-basin models. - Institutional weakness for WQ control and management.	Environmental degradation model defined at the end of year 1, and operational and used at the end of year 3.	100% of the models operational and scenarios defined used for TDA and SAP preparation.
	Definition of the action program for WQ protection included in the SAP	Not in existence	- Different national discharge norms related to sewage, industry, mining and diffuse sources assessed by the end of year 1, year 2 and year 3.. - Dissemination program in execution	100% of the program defined and supported as a result of the activities and used in the TDA-SAP preparation process.



Sub-component Objective & outcomes	Description of output indicator	Baseline level	Mid-term target	End-of-project target
Outcome II.2.1 Information and trained staff available to assess water quality, and actions to mitigate pollution sources in the LPB	Data sampling  Monitoring equipment  Trained staff personnel	National and GEF project water databases	Monitoring equipment operational by year 1  - 55 operational staff from the 5 countries trained in WQ monitoring.  - 4 campaigns per year with samples taken at 40 sites, with 46 parameters	Established and funded water quality monitoring network with funded sampling protocol
Outcome II.2.2 LPB environmental degradation model operational with forecasting capability	Models in operation and personnel qualified to operate them	- Uncoordinated national and sub-basin models. - Institutional weakness for WQ control and management	- Training manuals and courses developed for model users. - Environmental degradation models defined at the end of year 1, operational and in use at the end of year 3.	100% of the models operational and scenarios defined, used for TDA and SAP preparation.
Outcome II.2.3  A Water Quality Action Plan prepared by trained staff. to be consider during the SAP design process	Inter-calibration program of the participating laboratories.  Training protocol for water quality	Uncoordinated action plans, existing only in some national sub-basins, such as for the Bermejo and the FREPLATA GEF Projects.	Participating laboratories 75% compliant In the inter-calibration program.  75% of participating institutional staff trained in water quality protocol	100% of all participating laboratories in compliance with inter-calibration program. - Basin-wide directives for WQ endorsed by the countries through their representatives to the CIC - Staff from the 5 countries water institutions trained, participating in the TDA and the WQ Action Plan. - WQ Action Plan included in the SAP.

### Work Element II.2.1 Information

*Objective:* The creation of a monitoring network covering the La Plata Basin which measures the same parameters, under identical protocols, and uses a common Information Data Base, including information on the sources of contamination, which will be accessible to each of the Basin countries.

*Outcome:* Trained staff; Information available to assess water quality and actions to mitigate pollution sources

. *Output* II.2.1 Water quality information base

- Activities:
- Strengthen water quality riparian institutions
  - Integrate basin-wide water quality monitoring network (in coordination with II.1.3)
  - Inventory sources of pollution

Work Element Output and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
II.2.1 Output: Water quality information base	Data entered into the database about the total information available and data sampling	National and GEF project water databases	Monitoring equipment operational by year 1.  - 55 operational staff from the 5 countries trained in WQ monitoring.  - 4 campaigns per year with samples taken at 40 sites, with 46 parameters	100% completion of the database
<b>a) Strengthen water quality riparian institutions</b>				
o Identification of the institutions responsible for the proposed tasks and activities.			- Detailed listing of responsible institutions and their responsibilities by the end of the 3 <sup>rd</sup> trimester of year 1.	
o Identify the necessities for strengthening the institutions involved in maintaining a monitoring network.			- Breakdown of activities for each institution and results expected (training plans) by the end of year 1.	
<b>b) Integrate basin-wide water quality monitoring network (in coordination with II.1.3)</b>				
o Designing a data processing tool to store and process the available data. The database will be available in CIC portal.			- Implemented database by the end of the Project	
o Take samples and conduct field sampling: 4 per year taken at 40 sites, with 46 parameters. The sites and the parameters are found and defined in the Methodological Guide.			- Plan of operations of the monitoring network (sampling and analysis) by the end of year 1. Schedules of results, in agreement with the Methodological Guide	
o Analysis of the samples: The parameters that are not taken from the monitoring networks of the LPB countries will be analyzed.			- Results of the parameters that were not originally contained in the monitoring networks as well as an aggregation of the data contributed by the LPB countries available for TDA preparation, and additional yearly information at the end of the Project. - Schedules of results, in agreement with Methodological Guide	
o Acquisition of equipment and supplies needed for operation, field sampling, and for the laboratories.			- Plan for acquiring equipment – purchase plan by the end of the first trimester. - Training plan for the use and installation of the equipment by the end of the 2 <sup>nd</sup> trimester.	
o Monitoring and evaluation of the monitoring network			- Optimization plan for the Monitoring Network: evaluation of the sampling points, suggesting changes if necessary at the end of the first years of WQ campaigns and for the mid term review.	
<b>c) Inventory sources of pollution</b>				
o Survey and prioritization of rural and urban discharges; inventory of discharges and, in the sub basins considered to be a priority, inventory of environmental liabilities; validation of the Information			- Protocols and forms to survey and inventory discharges by the first year. - Georeferenced database of sewage, mining, industrial, urban and rural diffuse discharges and environmental liabilities, in the CIC at the end of the first year' campaigns.	
o Survey of Clean Technologies employed in the basin; inventory of the technology used in management of urban solid residues, agrochemicals, and recycling of dangerous residues. Incorporation of the information into the CIC. Validation and Synthesis.			- Protocols and forms to survey and inventory clean technologies and of waste treatment by the first year. - Database of sustainable technologies in the CIC by the 2nd year.	
o				

o	
o Survey of norms and existing permits for the control of urban sewage discharges; industrial, urban and rural diffuse discharges and for the management of dangerous residues.	- Protocols and forms to survey and inventory the norms and existing control permits for discharges at the end of the 1 <sup>st</sup> year.
o Proposal for limitations on direct discharges poured into shared segments of river.	- Update of the list of national institutions responsible for inventorying the contamination sources at the end of the 1 <sup>st</sup> trimester.
o Periodic updating of the inventory of sources of contamination, the technologies used, and of the database of norms and permits.	- Institutional / legal flow chart of permits and norms of dumping at the end of the 1 <sup>st</sup> year. - Database of norms and permits for dumping to control contamination in the LPB at the end of the 1 <sup>st</sup> year and available for the TDA - Protocol harmonizing of norms and permits for dumping to control of the contamination in shared segments of river by the end of the 1 <sup>st</sup> year.

### Work Element II.2.2 Creation of training and analysis of information

Objectives: Define the scenarios of contamination through usage of mathematical models.  
Outcome: LPB environmental degradation model operational with forecasting capability

Output II.2.2 LPB environmental degradation model

- a) Inventory existing environmental degradation models used in the LPB
- b) Develop an environmental degradation forecasting model
- c) Consolidate and integrate data systems into the LPB-DSS

Work Element Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output II.2.2 LPB Environmental Degradation model	Models in operation and personnel qualified to operate them	- Uncoordinated national and sub-basin models. - Institutional weakness for WQ control and management	- Training manuals and courses developed for model users. - Environmental degradation models defined at the end of year 1. operational and in use at the end of year 3.	100% of the models operational and scenarios defined, used for TDA and SAP preparation.
a) Inventory existing environmental degradation models used in the LPB				
o Inventory of the models Developer and applied in the Basin.			- Database of ecological models adopted and/or applied in the basin by the end of year 1.	
o Application of the available models to simulate scenarios of reducing contamination in critical zones.			- Results of the application of these models using the inventory of the sources of pollution and the data from the CIC monitoring network by the end of the 2 <sup>nd</sup> and 3 <sup>er</sup> years and for TDA preparation.	
o Selection of models and the incorporation of their results in the simulation analysis.			- Management models in use for critical areas by the end of the Project.	
o Identification of critical zones of contamination in agreement with the priority parameters.			- Map of the LPB (Sc. 1:100.000), identifying critical areas and indicating the problems and the principle sources of contamination available for TDA preparation at the 3 <sup>rd</sup> year.	

<b>b) Develop an environmental degradation forecasting model</b>	
<ul style="list-style-type: none"> <li>○ Design and implementation of Ad Hoc mathematical models to be used concerning priority contaminants in shared segments of river and, if applicable, in the sub basins.</li> </ul>	- New ecological models for priority contaminants by the end of the 3 <sup>rd</sup> year.
<ul style="list-style-type: none"> <li>○ Identification of information gaps, and organizations responsible for the development of models and the incorporation of the results of these models.</li> </ul>	- Results of the application of these models using the inventory of the sources of pollution and the data from the CIC monitoring network by the end of the 3 <sup>rd</sup> year.
<ul style="list-style-type: none"> <li>○ Identification of zones of critical contamination in agreement with the ad hoc models for the priority contaminants.</li> </ul>	- Map of the LPB Esc. 1:100.000, identifying critical areas and indicating the problems and the principle sources of contamination in agreement with the ad hoc models by the end of the 3 <sup>rd</sup> year for TDA preparation.
<b>c) Consolidate and integrate data systems into the LPB-DSS</b>	
<ul style="list-style-type: none"> <li>○ Integration and consolidation of the existing data in the Basin, including the data of other agencies (historic and current)</li> <li>○ Identification of critical areas for future projects</li> </ul>	<ul style="list-style-type: none"> <li>- System Implementing unified database– quality and contamination by the end of the 2<sup>nd</sup> year</li> <li>- Map of the LPB Esc. 1:100.000, identifying critical areas and indicating the problems and the principle sources of contamination by the end of the 3<sup>rd</sup> year for TDA preparation.</li> </ul>
<ul style="list-style-type: none"> <li>○ Formulating possible environmental scenarios.</li> </ul>	<ul style="list-style-type: none"> <li>- Future scenarios concerning water quality, based on ecological models</li> <li>- Future scenarios concerning freight and improvement in the processing of effluents.</li> <li>- Future scenarios evaluating the food chain over time in critical areas.</li> <li>- Evaluation of systems treating effluents</li> <li>- Evaluation of the scenarios from an economic, social, and environmental point of view.</li> </ul> <p>All for SAP preparation at the 4<sup>th</sup> year.</p>

### **Work Element II.2.3 Water Quality Action Plan for the SAP**

*Objectives:* Create a program with common norms, distribution initiatives and joint projects to be considered during SAP preparation and developed in the countries during SAP implementation.

*Outcomes:* Trained staff contributes to preparing the water quality action plan to be discussed and including during SAP preparation.

*Output* Water quality action plan

- Activities:*
- a) Identify legal framework for water quality objectives
  - b) Prepare a water quality management training program
  - c) Train and disseminate water quality information
  - d) Prepare water quality action plan

Work Element Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output II.2.3 Water quality action plan for the SAP	<p>Definition of the program and institutional working agreements.</p> <p>Inter-calibration program of the participating laboratories.</p> <p>Training protocol</p>	Uncoordinated action plans, existing only in some national sub-basins, such as for the Bermejo and the FREPLATA GEF Projects.	<p>-Program based in institutional working agreements, by the end of the 2<sup>nd</sup> year.</p> <p>- Participating laboratories 75% compliant with the inter-calibration program.</p>	<p>- Basin-wide directives for WQ endorsed by the countries through their respective representatives to the CIC</p> <p>- Staff from the 5 countries water institutions trained, participating in the TDA and the WQ action plan.</p>

	for water quality		-75% of participating institutional staff trained in water quality protocol  -20% of the common norms defined and a dissemination program being executed	- WQ action Plan included in the SAP.
<b>a) Identify legal framework for water quality objectives</b>				
<ul style="list-style-type: none"> <li>▪ Proposals for water quality objectives and quality levels for transboundary rivers</li> </ul>			- Common objectives for water quality for transboundary rivers	
<ul style="list-style-type: none"> <li>▪ Definition and calibration of the objectives of water quality and the utility levels for transboundary rivers.</li> </ul>			<ul style="list-style-type: none"> <li>- Document establishing the values of the water quality objectives for transboundary rivers, including the justifications and agreements by the LPB countries</li> <li>- Maps of the LPB (Sc. 1:100.000), indicating the levels of water quality in the transboundary rivers based on the defined objectives for water quality</li> </ul>	
<b>b) Prepare a water quality management training program</b>				
<ul style="list-style-type: none"> <li>▪ Technical training by means of workshops, seminars and courses</li> </ul>			<ul style="list-style-type: none"> <li>- Training plan for the institutions involved in the quality and monitoring network and involved in monitoring contamination.</li> <li>- 25 different training activities included in the training plan, implemented at the end of the Project</li> </ul>	
<ul style="list-style-type: none"> <li>▪ Exchange of professionals between the different responsible agencies of the basin with regard to training studies, and Exchange of analytical experts, as well as with the use of tools of evaluation prediction (quality models).</li> </ul>			<ul style="list-style-type: none"> <li>- Plan of joint activities among participant LPB institutions supporting WQ working elements.</li> <li>- Equalizing the level of knowledge of the infrastructure among the countries of the LPB.</li> </ul>	
<ul style="list-style-type: none"> <li>▪ Field work training conducted together with each of the five countries.</li> </ul>			<ul style="list-style-type: none"> <li>- Protocol of activities to homogenize the fieldwork operations by the end of year 1.</li> <li>- Equalizing the standards of field work procedures between the countries of the LPB</li> </ul>	
<ul style="list-style-type: none"> <li>▪ Inter-calibration program of the participating laboratories.</li> </ul>			<ul style="list-style-type: none"> <li>- Common protocol for the analytic quality of the laboratories</li> <li>- Policy of common analytic quality control of the laboratories</li> </ul>	
<b>c) Train and disseminate water quality information</b>				
<ul style="list-style-type: none"> <li>▪ Perfection of the Methodological Guide, dissemination of the results and the lessons learned (coordinated with the environmental education of the Project)</li> </ul>			<ul style="list-style-type: none"> <li>- Revised Methodological Guide, by the end of the first year of water campaigns.</li> <li>- Plan to disseminate the results and lessons learned by the end of year 3 for TDA preparation.</li> </ul>	
<b>d) Prepare water quality action plan</b>				
<ul style="list-style-type: none"> <li>▪ Formulation of a WQ Plan of Action for the SAP</li> </ul>			Plans of Action: Clean-up, Sources of contamination, mitigation, common policies for water quality, quality Objectives for transboundary rivers, for SAP preparation Plan for a quality alert network in coordination with contingency plans, for SAP preparation.	

2.9 Budget:

## Co-financing

Sources of Co-financing	Type of Co-financing	Amount
Government Contribution	In-Kind	\$ 1,367,321
ITAIPU BINATIONAL	In-cash	\$200.000

## GEF Budget

Concept	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200 Consultants	11,363	7,575	7,575	35,035	45,451	107,000
2200 Subcontracts with institutions	50,400	105,900	115,900	115,900	105,900	494,000
3200 Workshops and Training	76,000	53,500	53,500	76,000	98,500	357,500
4100 Teams and Supplies	209,300	142,800	13,300	48,300	13,300	427,000
5100 Publications & Equipment	3,000	3,000	0	0	0	6,000
<b>Total</b>	<b>350,063</b>	<b>312,775</b>	<b>190,275</b>	<b>275,235</b>	<b>263,151</b>	<b>1,391,500</b>

## Consultants to be hired for the project

Consultants Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
Local Technical Assistance			
Water Quality: Consultant 1	750	40	Specialist for coordination and follow-up
Water Quality: Consultant 2	750	13	Design of the software tool
Water Quality: Consultant 3	750	11	Proposal for direct discharge limits discharges into the shared courses
Water Quality: Consultant 4	750	35	Mathematical models and their application in the prevention of contamination.
Water Quality: Consultant 5	750	8	Proposal for Water Quality objectives.
Water Quality: Consultant 6	750	8	Plan for the dissemination of the results and lessons learned.
Water Quality: Consultant 7	750	20	Formulation of action plans.
Water Quality: Consultant 8	750	8	Optimization plan for the monitoring network.
Water Quality: Consultant 9	750	8	Optimization plan for inventory and the databases of the sources of contamination

See ToR in Annex 3

## Sub contracts with institutions to be hired for the project

Sub contracts	Tasks to be performed	Amount
Subcontract 1	Take samples and conduct field sampling: 4 per year taken at 40 sites, with 46 parameters. The sites and the parameters are found and defined in the Methodological Guide.	\$80.000
Subcontract 2	Laboratory Analysis of the samples: The parameters that are not taken from the monitoring networks of the LPB countries will be analyzed.	\$274.000

Sub contracts	Tasks to be performed	Amount
Subcontract 3	Survey and prioritization of rural and urban discharges; inventory of discharges and, in the sub basins considered to be a priority, inventory of environmental liabilities; validation of the Information	\$26.000
Subcontract 3	Survey of Clean Technologies employed in the basin; inventory of the technology used in management of urban solid residues, agrochemicals, and recycling of dangerous residues. Incorporation of the information into the CIC. Validation and Synthesis.	\$28.000
Subcontract 4	Survey of norms and existing permits for the control of urban sewage discharges; industrial, urban and rural diffuse discharges and for the management of dangerous residues.	\$20.000
Subcontract 5	Inter-calibration program of the participating laboratories.	\$66.000

**2.10 Timetable:** A summary timetable should be presented in the text and a detailed one should be put in Annex 3 as appropriate.

Working Element	Task	Activity Schedule																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>II.2.1 Information</b>																					
<b>1 Institutional Reinforcement</b>																					
	Identification of institutions																				
	Identification of necessities																				
<b>2 Monitoring Network</b>																					
	Design and implementation of computation tools																				
	Taking Samples																				
	Analysis of the Samples																				
	Equipment acquisition																				
	Monitoring and evaluation of the operation of the Network																				
<b>3 Inventory of the Sources of Contamination</b>																					
	Evaluation and inventory of urban and rural discharges for the TDA and SAP process.																				
	Urban Sewage Discharges																				
	Mining and Industrial Discharges																				
	Disperse urban and passive rural discharges																				
	Evaluation of clean technologies employed in the basin																				
	Sewer System exit discharges																				
	Mining and Industrial Discharges																				
	Management of agrochemical and dangerous residues																				
	Evaluation of the norms and limits in direct discharge dumping																				

Working Element	Task	Activity Schedule																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	Norms and permits for the control of sewage discharges																				
	Norms and permits for the control of industrial and mining discharges																				
	Norms and permits for the control of diffuse discharges																				
	Proposal for limits on dumping in transboundary rivers																				
	Updating of the database																				
<b>II.2.2 Creation of training and analysis of information</b>																					
<b>1 Evaluation of the Mathematical Ecological Models in existence and in us in the La Plata Basin</b>																					
	Inventory of the existing ecological models in the Basin																				
	Application of the available models and use for the TDA and SAP preparation																				
	Selection of the models and incorporation of the results																				
	Identification of critical zones																				
<b>2 Development of the Mathematical Ecological Models – Forecast</b>																					
	Design and implementation of the ecological models																				
	Identification of information gaps. Identification of relevant organizations																				
	Identification of critical zones																				
<b>3 System consolidation – Scenarios</b>																					
	Integration and consolidation of the existing data within the Basin for TDA																				
	Critical Areas for future Projects																				
	Formulation of Future Scenarios for the SAP																				
<b>II.2.3 Action Plan</b>																					
<b>1. Legal Framework</b>																					
	Creation of a water quality objectives proposal for SAP																				
	Definition and calibration of the water quality objectives																				
<b>2 Training Program</b>																					
	Technical Training																				
	Professional Exchange Programs																				
	Field Training																				
	Intercalibration																				
<b>3 Dissemination program</b>																					
	Perfecting the guide and disseminating it																				



Working Element	Task	Activity Schedule																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>4 System Consolidation – Plan of Action</b>																					
Formulation of a plan of action																					

**2.11 Cost effectiveness:** Water quality degradation has been shown to restrict the availability of water for economic purposes, and to cause, *inter alia*, loss of biodiversity, ecosystem change and public health concerns. Taking a regional approach to the action plan for assessing and monitoring water quality and contamination at the basin level has been shown to be much a more effective approach when compared to similar actions undertaken at the individual or national basin level. Cost effectiveness is two-fold when dealing with water quality and contamination at the basin-wide level, optimizing both human and financial resources through (1) considering the transboundary dimensions of the issue to be addressed and (2) taking transboundary issues in such a manner as to yield global benefits. Cost effectiveness at the technical and economic levels can be maximized by developing focused pilot interventions in multi-national areas, which can be replicated at the basin level in conformity with regional guidelines and agreement. For example, the relationship of the present subcomponent with the pilot project at Pilcomayo Basin demonstrates key lessons pertaining to cost-effectiveness. The Pilcomayo pilot project deals with mining contamination in an upstream country (Bolivia) and its relation with downstream countries (Argentina and Paraguay). In this specific case, implementing pollution abatement practices in upstream areas will avoid more expensive work downstream. Additionally, technical and economic benefits will be maximized due to the synergy achieved through joint action at the local and basin level.

**2.12 Sustainability:** Project activities and implementation are designed (including the public involvement and stakeholder participation processes) to achieve sustainability. All of the activities form the foundation of a multi-sector, multi-institutional, and basin-wide arrangements for the implementation of the monitoring system. The project will be carried out by relevant government agencies, and will strengthen the existing institutional and human capacities. The networks will be integrated at an agreed upon regional level using a common framework, which maintains national responsibility for executing the action plan established for this stage.

### 2.13 Risk Analysis

Risk	Rating (L/M/h)	Risk Mitigation Measures
The monitoring network is not sustainable	L	- Involve the key institutions so that they may take ownership of the network.
Countries are not able to integrate the ability to carry out the monitoring system		- Proper training, strengthening common methodologies. - Effective joint measurement campaigns - - Creating a network of institutions and technical experts in the field.

**2.14 Replicability:** The results of the Project will be disseminated through governmental institutions, nongovernmental organizations, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including the institutions related thereto in each of the five countries, will permit the development of information transfer mechanisms to share new knowledge and provide for active coordination and horizontal cooperation in the integrated management of the water resources of the Basin. The pilot project deals with a common upstream problem of the basin and the insight obtained will be easily adopted at the regional level throughout the disseminated process.

Since all of the proposed activities are multifaceted in nature and include a strong multi-stakeholder participation element which will contribute to the “buy-in” of the project constituencies, the prospect for

replicating such activities are high and can be achieved with minimal efforts exchanging relevant information and experience learned.

**2.15 Execution arrangement:** The Subcomponent will be executed by the Subsecretaría de Recursos Hídricos, Instituto Nacional del Agua, Secretaría de Medio Ambiente y Desarrollo Sostenible, Prefectura Naval and water resources organizations of the provinces of Argentina within the la Plata Basin; SENAMHI and Instituto de Investigaciones Químicas of the Universidad Mayor de San Andrés of Bolivia; Secretaría de Recursos Hídricos/Ministerio do Meio Ambiente, Agencia Nacional de Águas, IBAMA, Ministério das Cidades, Serviço Geológico Brasileiro (CPRM), organizations and institutions for water resources and environment of the Brazilian states within the la Plata Basin; Secretaría del Ambiente–SEAM, SENASA and Empresa de Servicios Sanitarios del Paraguay in Paraguay; Dirección Nacional de Medio Ambiente y Dirección Nacional de Hidrografía in Uruguay; and CARU and CARP

**2.16 Public participation mechanisms:** The participative dimension strengthens Basin governance, and is present in each of the activities to be executed during the project. Promoting public participation in this project is integral present throughout the process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society — with a special focus on gender equity and indigenous peoples. This involvement will also favor appropriations and the social sustainability of the action plan during both its formulation and implementation, including the consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

**2.17 M&E:** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

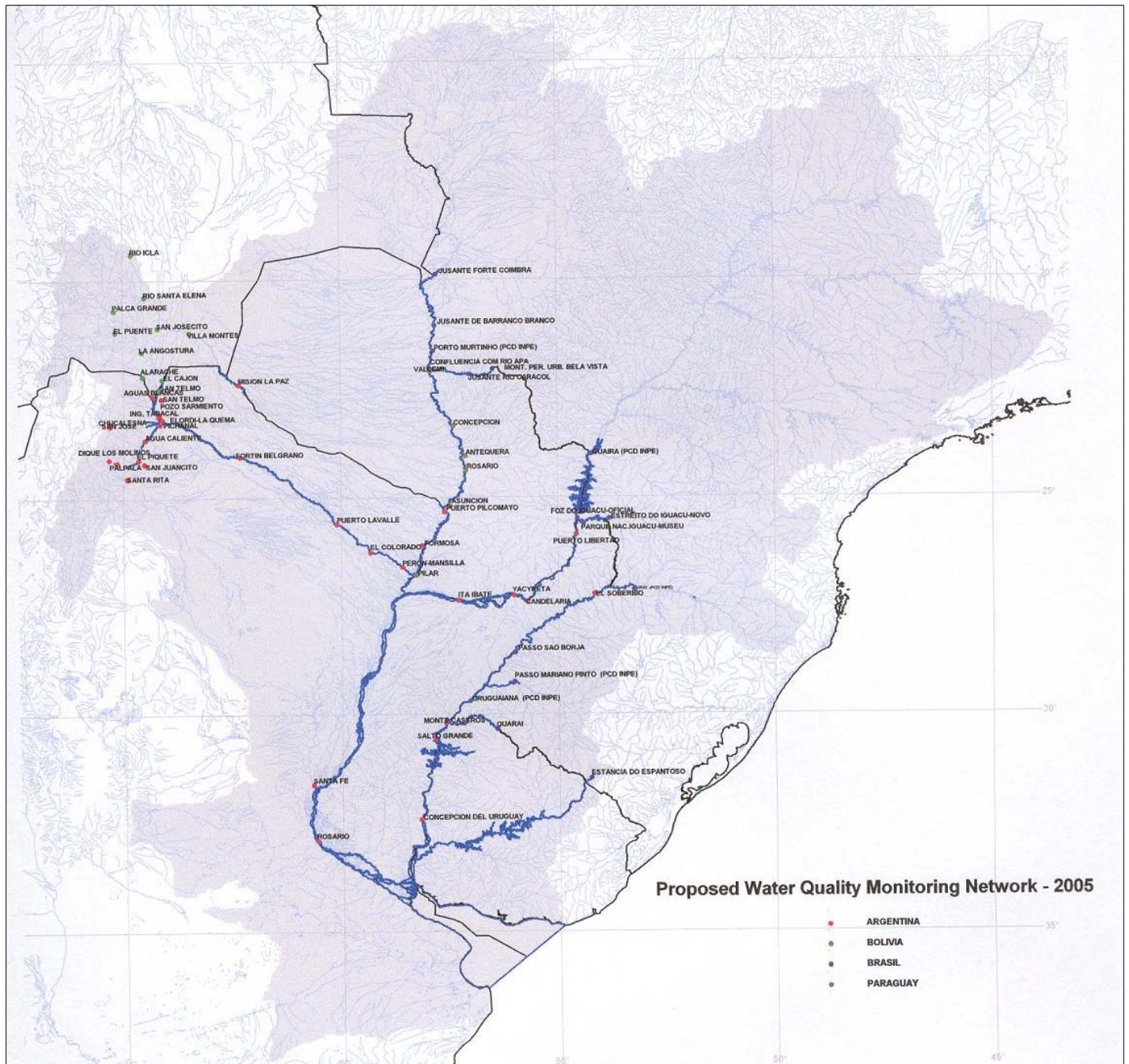
#### PROCESS OUTCOMES AND INDICATORS

Process OUTCOMES			Process INDICATORS
Project			Project
Multi-country agreement on transboundary priority concerns, impact and cause			<ul style="list-style-type: none"> <li>- Water quality monitoring network designed and database operating after 15 months, Hardware and other equipment and input acquired after 12 months; 20 identified professionals for training activities by areas to be detailed and the curricula and syllabus of the courses, workshops and seminars available 9 months after the beginning of the Project.</li> <li>- Follow-up and assessment of the Monitoring Network: number of analyses done and samples collected on an annual basis; network enhancement plan; reports on lab inter-comparison on an annual basis.</li> <li>- Identification of contamination sources: Database for decision-making purposes, designed, and operating 60 months after the beginning of the Project.</li> <li>- Preparation of a regulatory framework for water quality for the La Plata basin countries 54 months after the beginning of the Project.</li> <li>- CIC Water Quality Methodological Guide approved 6 months after the beginning of the Project.</li> </ul>
Multi-country agreement on governance reforms and investment to			<ul style="list-style-type: none"> <li>- Constitution of the Technical Counterpart of the CIC relating to Water Quality as an advisory committee for the execution of the Subcomponent 2 months after the beginning of the Project .</li> </ul>

Process OUTCOMES			Process INDICATORS		
Project			Project		
address priority transboundary concerns			-	Reports and minutes of meetings of the Technical Counterpart of the CIC concerning water quality.	
Effective national Inter-ministry Coordination			-	Inter-ministerial mechanism established at the national level to agree to the execution of the Water Quality Subcomponent (national group).	
			-	Inter-ministerial agreement of the agencies involved in each country to define the representation of the Technical Counterpart of the CIC concerning water quality.	
			-	Reports and minutes of meetings of the national groups.	
Stakeholder involvement			-	Increase awareness of and participation in Water Quality project activities through workshops and meetings with local authorities, institutions, and stakeholders.	
			-	Preparation and wide dissemination of project-related documentation and project-related activities through the fund for civil society (PPF.)	
Transboundary waters legal framework adopted and/or strengthened			-	Legal framework in agreement with the CIC	
			-	Approval of a regulatory framework for water quality for the la Plata Basin countries before the end of the Project	
Newly established and/or strengthened (existing) transboundary waters institutions			-	Cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.	
			-	Institutional strengthening (training and equipment) provided to institutions related to the water quality and contamination.	

ANNEXES

Annex 1: Proposed Water Quality Monitoring Network - 2005



**Annex 2: Additional information of the Budget**

<b>Consultants</b>	<b>Year of Execution</b>					<b>Time in Total (months)</b>
	1	2	3	4	5	
1. Contracting of Consultant to Coordinate the Tasks of the entire Element.	X	X	X	X	X	14
2. Design of the software tool	X					3
3. Proposal for limits on direct discharge dumping into shared watercourses.					X	6
4. Mathematical models and their application in the prevention of the phenomena of contamination.				X		6
5. Proposal for Water Quality objectives					X	6
6. Plan to disseminate the results and lessons learned.					X	6
7. Formulation of action plans.					X	6
8. Optimization plan for the monitoring network					X	3
9. Optimization plan for the inventory and the databases of the sources of contamination				X	X	6

<b>Workshops / Meetings Subject areas</b>	<b>Year of Execution</b>					<b>Characteristics</b>
	1	2	3	4	5	
Workshop 1. Identification of the institutions linked to Water Quality and its needs.	X					3 Day Workshop
Meeting 1 Design of the software tool. Inventory of urban and rural discharges. Database of the Technologies employed. Limits on dumping. Program to intercalibrate the laboratories involved. Updating the Guide and disseminating the results. Tracking and evaluation of the monitoring network.	X	X	X	X	X	Meeting 3 days per year
Workshop 2 Limits on dumping. Proposal for limits on dumping of direct discharges in shared watercourses.				X		2 day Workshop
Meeting 2 Evaluation of the mathematical models. Development of the mathematical models. Consolidation of the system. Definition of scenarios.				X	X	Meetings: one before and one after the modeling consultation.

<b>Workshops / Meetings Subject areas</b>	<b>Year of Execution</b>					<b>Characteristics</b>
	1	2	3	4	5	
Development of a proposal for Water Quality objectives. Definition and calibration of the objectives for Water Quality.					X	Meeting prior to consultation.
Workshop 3 Periodic updates of the inventory and database of the sources of contamination.				X		Workshop prior to consultation
Workshop 5 Formulation of plans of action. Periodic updates of the inventory, Proposal for limits on dumping of direct discharges in shared watercourses.					X	
Workshop 6 Technical Training	X	X	X	X	X	Courses to be defined

## Sub-contracts

<b>Subcontracts with institutions Tasks to develop</b>	<b>Year of Execution</b>					<b>Characteristics</b>
	1	2	3	4	5	
Subcontract 1: National Institutions of the 5 Countries						
Sampling	X	X	X	X	X	Field activity. Sampling: 4 per year at 40 sites with 46 parameters. The sites and the parameters are defined in the Methodological guide, with adjustments suggested by the Technical Counterparts on Water Quality of the five countries.
Subcontract 2: Laboratories of the 5 Countries						
Schedules of results in conformity with the methodological guide	X	X	X	X	X	
Subcontract 3: National Institutions of the 5 Countries						
Inventory of discharges. Contaminants. Identification of priority discharges and special organizations. Evaluation of existing information	X	X	X	X	X	Field work
Subcontract 4: National Institutions of the 5 Countries						
Evaluation of the use of clean technologies. Identification of the relevant organizations. Evaluation of existing information.	X	X	X	X	X	Field work.
Subcontract 5: Laboratories of the 5 Countries						
Analysis of samples.	X	X	X	X	X	
Subcontract 6: Laboratories of the 5 Countries						
Program of intercalibration of the laboratories	X	X	X	X	X	

	<i>Year of Execution</i>					
Subcontract 7: National Institutions of the 5 Countries						
Evaluation of the norms and permits limiting dumping			X	X		Field work.

**Annex 3: Terms of Reference for Consultants****Consultant 1****Objective:**

Contracting of Consultants to Coordinate all of the tasks of the Element.

**Activities:**

Launch this element through the following tasks:

- a) Development of Protocols of Invent de Protocols of Pollution Sources Inventory to present in the initial meetings to be conducted with experts from the countries.
- b) Organization and execution of the initial meetings with the Water Quality Group and the Contamination Group (technical counterparts) in order to define/reach a consensus on: the proposed activities, the executors of the field activities following the specific requirements of each country and the consulting blocks.
- c) Development of Reference Terms for the tasks to be carried out by future consultants and laboratories as well as memoranda of understanding to be defined in the initial meetings:
- d) The method of recruiting future consultants and laboratories will depend upon the period of Consultant in each case.

The contracts may be:

- by results; when a consultancy is scheduled for less than six months
- by employment: when a consultancy is scheduled for more than six months, when it implies the application of the consultation to the entire project or to the majority thereof, as measured at the time of execution.

e) Conduct a survey of the institutions of the basin actively engaged in activates linked to water quality and sources of pollution.

- i) To do so, list, country-by-country, all institutions related to the topic, based on existing information, as well as information collected from the counterpart.
- ii) evaluate the capacity of each institution, both in human and material resources
- iii) Identify input needs in such so as to generate similar capabilities to control water quality and pollution sources in each country. Purchases will be grouped in such a way to make acquisition process as competitive as possible. Develop technical specifications for equipment and materials to purchase.
- iv) Depending on the assessment of the availability of skilled human resources, staffing requirements and training for the staff will be established. Based on those need, the consultant will determine suitable plans for each country, always striving to achieve economies of scale. In doing so, first, training needs will be identified, and then upon evaluating these needs an optimal strategy to achieve the objective will be designed in a way to include horizontal cooperation.

f) Defining field logistics for the launch of the network.

g) Utilization of meetings with the Water Quality Group, the Pollution Group and consultancies to start initial activities of the action and agree upon the action plan.

Monitoring the Activities Evaluating the Progress, Adjusting the Process if Necessary and Performing an Integration of All Products (two months per year).

Integration of the Working Groups and the Organization of Events to consolidate all of the activities being developed in the component.

**Results:**

At the end of each stage of his work, the consultant will be required to deliver a report which sets forth the goals reached and the recommendations it deems appropriate to achieve the best result set for the Element.

In particular the consultant shall submit a Plan of Acquisition and a Training Scheme to be implemented. It is hoped that this study will be the basis for implementing a monitoring network that is operable by countries and is sustainable from the point of view of the economic demands and skilled human resources which it will require.

**Duration:**

Six months from the start of the project to launch the Element and two months per year to schedule, organize and convene the Annual Meeting of the Working Group on Water Quality and Pollution.

The consultant will be required for a total period 14 months of work.



**Consultant 2****Objective:**

Design of the software tool

**Activities:**

Survey of all measured parameters of Water Quality and linking them to their geographical location.

Designing the database so that it is user friendly for the public to access.

Designing the database so that it can be updated (loading of data) from each of the 5 countries that make up the La Plata Basin.

The consultant will take into account the Characteristics of the software it must develop and its growth potential over time, both due to the increase in information processed as well as for the possible incorporation of new areas.

It should also develop and deliver the instruction manuals for using the Database, and should train 3 people in each country, in all the tasks involved with the operation and maintenance of it.

**Results:**

- Protocols and forms to survey and inventory the existing rules and permits for the control of discharges.
- Adjust the list of National Institutions responsible for the inventory of pollution sources.
- Flowchart of institutional / legal permits and dumping standards.
- database standards and discharge permits controlling pollution in the La Plata Basin
- Protocol harmonizing the standards and discharge permits controlling pollution in the shared watercourses.

**Duration:**

The time required to complete the execution of the task is 6 months.

**Consultant 3****Objective:**

Proposal for limits on direct discharge dumping in shared watercourses.

**Activities:**

Conducting an inventory of the rules governing direct discharges to watercourses, in the 5 countries.

- Designing protocols and forms to be used in the survey of the existing licenses for issuing permits for discharges in shared watercourses in the basin.
- An updated list of institutions in each country responsible for granting permits and consequently making an inventory of this information available.
- Based on the laws and regulations in force in each country, make a flowchart to explain the process for granting a permit for discharges in shared watercourses.
- Database Design standards and discharge permits in controlling pollution in the La Plate Basin.
- Finally, the Consultant will conduct a project to create a protocol for harmonizing standards and granting discharge permits in the shared watercourses.

**Results:**

Protocols and forms to survey and inventory the existing rules and permits to control discharges

- Updated list of the National Institutions responsible for inventorying the sources of contamination.
- Flowchart of institutional / legal permits and dumping standards.
- database standards and discharge permits controlling pollution in the La Plata Basin
- Protocol harmonizing the standards and discharge permits controlling pollution in the shared watercourses

**Duration:**

The time required to complete the execution of the task is 6 months

**Consultant 4****Objective:**

Mathematical models and the application of such modes in the prevention of phenomenon of contamination.

**Activities:**

Conducting an inventory of Water Quality Parameters to be measured in watercourses and to associate them with the location where they are measured. To complete this task, it is necessary to accompany this inventory with the identification of discharge points in the watercourses.

- Based on the measured parameters, the consultant must conduct a survey of the mathematical models

used in the basin which might suit the needs of the project. Analyze the strengths of each and propose to the Project Management those models that best suit the conditions of the project. Preference will be given to the use of models that are already operating in the country. In the case that it becomes necessary to purchase any license, the consultant will propose the model which he considers most appropriate for the project.

- Once the model to be used is determined, the consultant will provide any licenses which are missing (whose price will be paid separately from this consultancy) and proceed to revise or begin modeling. The model will be verified through various calibrations and will be supervised by the Project Management and representatives of the countries.
- Once calibrated, the models will be used, beginning with the stage of identifying scenarios. To do so, it will first identify the present critical scenarios, defining them as critical based upon the parameters evaluated through the model, and following the values agreed to by the countries. Subsequently the model should evaluate the discharge permits which are managed at the national level and assess the impact of these. Other modalities which will be used to run future scenarios will be proposed by the consultant. The modeling of such future scenarios, will serve as a foundation for future decision-making with regard to the preservation of water quality in shared or transboundary watercourses.
- The evaluation of the future scenarios will be essential in determining where and when to allow the development of enterprises, both urban and industrial, by evaluating the impact which their waste will have over time in the watercourses.
- Finally the Consultant will conduct the training of future operators of the models in each country, providing a minimum of 3 people in each country, totaling at least 15 people to be trained

**Results:**

Database of the ecological models adopted and/or applied in the Basin.

- Results from the application based upon the inventories of the sources of contamination and the results of the CIC monitoring network.
- Management models with priority parameters in critical areas (existing and in use)
- Location of the critical areas identified on a map which identifies the problems and principle sources of contamination.
- New ecological models for priority contaminants
- Location of the critical areas identified on a map which identifies the problems and principle sources of contamination, in agreement with the ad hoc models.
- Future Water Quality Scenarios, based on ecological models.
- Future load and improvement Scenarios in terms of treatment of effluents.
- Future Scenarios for assessing the food chain over time in identified critical areas.
- Evaluation of effluent treatment systems.
- Evaluation of the scenarios in terms of environmental, social and economic effects.

**Duration:**

The time required for the completion of this task is 6 months.

**Consultant 5**

**Objective:**

Proposal for Water Quality Objectives

**Activities:**

Take inventory of the Water Quality parameters to be measured on shared watercourses which are associated with the location where point of measured along with the identification of the points of discharge into the watercourses.

- Analysis of Water Quality Parameters associated with the knowledge of the posed future scenarios will allow the consultant to propose Water Quality objectives to be achieved in periods to be determined. Moreover, the consultant will establish successive stages to be addressed upon the accomplishment of the previous stage. This proposal will be put before the countries by the management of the project and the counterparts of the countries
- Once an agreement is reached concerning the objectives for Water Quality, the consultant will prepare a document clearly establishing the objectives and the strategy that will be used to achieve them.

**Results:**

- Shared Water Quality objectives for shared watercourses
- A document with the values of the quality objectives for the shared watercourses, agreed to by the

countries.  
 -Maps of the Water Quality levels in the shared watercourses based upon the defined quality objectives.  
**Duration:**  
 The time required to complete this task is 6 months.

#### Consultant 6

**Objective:**

Plan for the dissemination of the results and lessons learned.

**Activities:**

- Gather information on the products used in the project and update the Methodological Guide.
- Define the recipient population, which in each country should know the results of the project in order to join the process and work with the scope of the targets set.
- Define the content of the material to be distributed, according to the needs of the project and based upon the population to which it should go.
- Prepare a plan to disseminate these accomplishments along with the project.
- List the lessons learned through the course of the accomplished work and prepare a strategy for the distribution of this list.

**Results:**

Updated methodological guide

- Plan to disseminate the results and lessons learned

**Duration:**

The time required to complete this task is 6 months.

#### Consultant 7

**Objective:**

Formulating Plans of Action

**Activities:**

Formulating action plans for basic sanitation.

The consultant must develop action plans to achieve the agreed upon work, according to the studies conducted and the targets agreed upon. In particular he shall take into account the actions to be developed with regard to basic sanitation, identifying the need to carry out works or to modify the treatment of effluents so as to reduce loads which are pollutant.

- Formulation of Action Plans for the control of pollution sources. The consultant should design a strategy to address the current sources in the in various countries as well as to address potential sources of pollution. Identify critical zones where it is necessary improve the parameters for dumping, as well as those areas, which by their physical characteristics must be protected against the development of enterprises, which could potentially cause significant contaminants.
- Formulation of Action Plans to alleviate the sources of pollution. In a similar way to that described above, the consultant will design an action plan to mitigate the sources of pollution affecting water quality of shared watercourses.
- Formulation of Action Plans to achieve common Water Quality policies in the countries of the La Plate Basin. Indicate the best suited to achieving the stated objective, as well as to implement the common Water Quality objectives in the countries sharing a watercourse. Design a plan for a Water Quality warning network (associated with a contingency plan), as a way of dealing with unforeseen situations of conflict.

**Results:**

Plans of Action: Sanitation, Sources of pollution, Mitigation, Common Water Quality Policies, Quality objectives for common watercourses.

**Deadline:**

The time required to complete this task is 6 months.

#### Consultant 8

**Objective:**

Optimization Plan for the monitoring network.

**Activities:**

Survey of the existing monitoring network, and the characteristics of the territory where it operates.

- Evaluation of the same, analyzing the results obtained the necessity to generate new control points, as well as the possibility of moving an existing point.

**Results:**

Optimization plan for the monitoring network, evaluation of the points, samples, suggestions for changing the points if necessary

**Duration:**

The time required to complete this task is 3 months.

**Consultant 9**

**Objective:**

Optimization Plan for the inventory and databases of the sources of contamination

**Activities:**

- Survey all existing inventories, as well as the ways in which they are maintained by each country
- Analyze and present any options that could be found among the existing inventories and the reality of each country, keeping in mind that it is of the highest importance to obtain an understanding about the sources of contamination of the shared watercourses.
- Design a strategy to maintain an updated inventory with the resources available in each country.

**Results:**

- Optimization plan for the inventory and databases for the sources of contamination for the La Plata Basin.

**Duration:**

The time required to complete this task is 6 months.

**Annex 4: Water Quality Methodological Guide (in Spanish)****GUIA METODOLOGICA PARA LA OPERACIÓN Y EVALUACIÓN DE LA RED SOBRE CALIDAD DE LAS AGUAS EN LA CUENCA DEL PLATA****1.- METODOLOGIA DE MUESTREO** (representatividad y confiabilidad)

Las premisas a tener en cuenta para este tema son:

- Conveniencia de operar el programa de monitoreo en la red, con la mayor uniformidad posible en las tareas de muestreo para luego, una vez procesada la información, realizar los ajustes que correspondan para cada uno de los ítems involucrados en las mismas.
- Disponibilidad de personal idóneo y capacitado en las técnicas de extracción, almacenamiento y preservación correspondientes a los parámetros a determinar, correcta identificación de envases y llenado de las planillas de muestreo.
- Utilización correcta de equipos de campo, calibrados de acuerdo a las normas de práctica, específicas para el parámetro a medir.
- Selección apropiada de las estaciones de muestreo y de los puntos de extracción en cada uno de ellas.

**1.1.- Cantidad de muestras por campaña y estación de muestreo.**

- La colecta de muestras puntuales en la columna de agua será realizada en forma manual o automática.

Para ríos se propone la siguiente clasificación de cantidad de puntos de muestreo:

Caudal anual promedio (m <sup>3</sup> /s)	Clasificación del curso de agua	Cantidad de puntos en la transversal	Cantidad de profundidades de muestreo
5 -150	arroyo	3	2 <sup>(1)</sup>
150 - 1000	río	3	3 <sup>(2)</sup>
> 1000	río grande	4	3

<sup>(1)</sup> Corresponde a una muestra subsuperficial y una de fondo

<sup>(2)</sup> Corresponde a una muestra subsuperficial, una a media profundidad y una de fondo

Las muestras en la vertical serán compuestas en una sola

Para lagos y embalses se propone la siguiente clasificación de cantidad de puntos de muestreo: Se operará como mínimo una estación en el centro del embalse o lago

Profundidad del lago o embalse	Cantidad de puntos
< de 10 m	2 puntos (subsuperficial y fondo)
< de 30 m	3 puntos (subsuperficial, termoclina y fondo)
> de 30 m	Mínimo 3 puntos (subsuperficial, termoclina y fondo)

Las muestras subsuperficiales se tomarán a 50 cm de la superficie y las de fondo serán tomadas a 1m aproximadamente del lecho.

El dispositivo de muestreo será botella no tóxica, de material adecuado al parámetro a analizar (PVC o acero respectivamente) tipo Niskin o Van Dorn, de 2 y 6 litros de capacidad. Para muestras sub - superficiales se podrá usar un muestreador de frascos múltiples de acero inoxidable, que permita sumergir frascos descontaminados.

- Las estaciones de muestreo serán geo-referenciadas mediante el empleo de GPS y ubicadas en mapa. Se recomienda emplear cartografía oficial en una escala 1:50.000 o de mayor detalle si estuviera disponible

- Sería conveniente coordinar los muestreos con los pasajes de los satélites de forma de referenciar la información

**1.2.- Parámetro, preservador, envase y tiempo de preservado**

PARAMETRO	PRESERVADOR	ENVASE	TIEMPO DE PRESERVADO
Alcalinidad	s/p, refrigerada a 4 °C	P o V x 500 ml	14 días

Arsénico	pH < 2, HNO <sub>3</sub> (c)	P o V (A) x 250 ml	6 meses
Boro	s/p, refrigerada a 4 °C	P x 250 ml	7 días
Cianuro	pH>12, NaOH (20 lentejas)	P o V x 1 L	14 días
Cloruro	s/p	P o V x 1 L	28 días
Coliformes fecales y totales	s/p, refrigerada a 4 °C	P, estéril.	6 horas
Escherichia Coli	s/p, refrigerada a 4 °C	P, estéril.	6 horas
Conductividad	s/p, refrigerada a 4 °C	P o V x 1L	28 días
Carbono orgánico total	enfriar a 4°C HCl hasta pH<2	V 100 ml	7 días
Demanda química de oxígeno (DQO)	pH < 2, SO <sub>4</sub> H <sub>2</sub> (c), refrigerada a 4 °C	P o V x 1 L	28 días
Demanda bioquímica de oxígeno (DBO)	s/p, refrigerada a 4 °C	P o V x 1 L	2 horas
Detergentes (SAAM)	s/p, refrigerada a 4 °C	P o V (A) x 1 L	2 días
Dureza,Ca,Mg	pH < 2, HNO <sub>3</sub> (c)	P o V x 500 ml	6 meses
Fenoles (Colorimétrico)	pH < 2, H <sub>3</sub> PO <sub>4</sub> (c), refrigerada a 4 °C.	V ámbar x 1L	28 días
Fósforo Total	pH < 2, SO <sub>4</sub> H <sub>2</sub> (c), refrigerada a 4 °C	V x 250 ml	7 días
Hidrocarburos totales	pH < 2, HCl (c), refrigerada a 4 °C	V ámbar x 1L	28 días
Mercurio	pH < 2, HNO <sub>3</sub> (c)	P(A) o V(A) x 500 ml	28 días
Metales	pH < 2, HNO <sub>3</sub> (c)	P(A) o V(A) x 500 ml	6 meses
Nitrógeno de amoniacó	pH < 2, SO <sub>4</sub> H <sub>2</sub> (c), refrigerada a 4 °C	P o V x 1L	7-28 días
Nitrógeno de nitrato	pH < 2, SO <sub>4</sub> H <sub>2</sub> (c), refrigerada a 4 °C	P o V x 1L	2 días
Nitrógeno de nitrito	s/p, refrigerada a 4 °C	P o V x 1L	2 días
Trihalometanos	pH < 2, SO <sub>4</sub> H <sub>2</sub> (c) o ClH, refrigerada a 4 °C, Si contiene cloro residual eliminar con 1 ml tiosulfato de sodio 10%.	V(A) x 250 ml o viales	

(Cont.)

PARAMETRO	PRESERVADOR	ENVASE	TIEMPO DE PRESERVADO
Nitrógeno total Kjeldhal (NTK)	pH < 2, SO <sub>4</sub> H <sub>2</sub> (c), refrigerada a 4 °C	P o V x 1L	28 días
Ortofosfato soluble	s/p, refrigerada a 4 °C	V ámbar x 250 ml	2 días
OD (Winkler)	Fijada en campo	Frasco de DBO	8 hs
OD (Electrodo)	No requiere	V 300 ml	Analizar

			inmediatament e
pH	Refrigerada a 4 °C	P o V	2 horas
Pesticidas organoclorados	Refrigerada a 4°C. Si contiene cloro residual eliminar con 1 ml tiosulfato de sodio 10%.	V ámbar x 1L. Tapa a rosca y contratapa de Teflon	7 días
Sólidos suspendidos totales	Refrigerada a 4 °C	P o V x 1L	7 días
Sulfato	s/p, refrigerada a 4 °C	P o V x 500 ml	28 días
Turbidez	Refrigerada a 4 °C	P o V x 500 ml	7 días

Donde:

s/p: sin preservar

P: plástico

V: vidrio

V (A): Vidrio lavado con ácido nítrico (1+1)

P (A): Plástico lavado con ácido nítrico (1+1).

SAAM: Sustancias activas al Azul de Metileno

**NOTAS:**

La preservación deberá realizarse inmediatamente después de la colecta de la muestra.

Para metales pesados, fósforo y plaguicidas los envases deberán ser lavados según lo indique la técnica analítica.

**1.3.- Frecuencia de muestreo**

Se sugiere una frecuencia de cuatro (4) muestreos anuales por estación la cual se considera conveniente. Se prestara atención al régimen hidrológico. Muestreos deberían coincidir con las estaciones climáticas.

**2.- TECNICAS ANALITICAS A UTILIZAR PARA EL RELEVAMIENTO DE LOS PARAMETROS DE CALIDAD DE AGUA EN LA CUENCA DEL PLATA**

Este capítulo incluye la descripción de los principios de una serie de técnicas de campo y laboratorio consideradas apropiadas a los fines de la metodología.

**2.1.- Determinaciones “in situ” y de campo.**

## a) Parámetros a medir:

1. Temperatura del agua
2. Turbiedad
3. pH
4. Conductividad
5. O.D.
- 6.- Profundidad de disco Secchi

b) Instrumental, Control, Calibración, Expresión de Resultados.2.1 b) 1 - Temperatura

Para muestras de superficie se utilizará un termómetro de mercurio calibrado, con división al 0,1 °C..

Para muestras a diferentes profundidades se utilizará un termómetro de inversión o un termistor.

Expresión de resultados: °C, con aproximación de 0,1 °C.

2.1 b) 2 - Turbiedad

Turbidímetro (nefelómetro). Calibración: instrucciones del fabricante. Para muestras a diferentes profundidades se utilizarán sondas de profundidad adecuada

Expresión de resultados: unidades nefelométricas de turbiedad (UNT).

2.1 b) 3- pH

Medición de potencial eléctrico a través de un pH-metro, con electrodo de vidrio mas electrodo de referencia o electrodo combinado. Para muestras a diferentes profundidades se utilizarán sondas de profundidad adecuada

Calibración con soluciones buffer de aproximadamente 4, 7 y 9 de pH.

Expresión de resultados: unidades de pH

2.1 b) 4- Conductividad

Se utilizará para su medición un conductímetro (método electrométrico). Calibración: acorde a instrucciones del fabricante. Para muestras a diferentes profundidades se utilizarán sondas de profundidad adecuada

Expresión de resultados:  $\mu\text{S/cm}$ .

2.1 b) 5- O.D

Se utilizará para su medición un electrodo de membrana (tipo polarográfico). Calibración: acorde a instrucciones del fabricante. Para muestras a diferentes profundidades se utilizarán sondas de profundidad adecuada

Expresión de resultados:  $\text{mg O}_2/\text{l}$

Alternativa: Método de Winkler (fijación en campo).

## 2.2.- Parámetros de Laboratorio

### a) Parámetros a medir

- |                          |                                    |
|--------------------------|------------------------------------|
| 1. Turbiedad             | 2. Coliformes Totales              |
| 3. O.D.                  | 4. Bacterias termotolerantes (Fec) |
| 5. D.B.O.                | 6. Escherichia Coli                |
| 7. Cloruros              | 8. Nitrógeno de Amoníaco           |
| 9. Cianuros              | 10. Nitrógeno de Nitrato           |
| 11. Arsénico             | 12. Nitrógeno de Nitrito           |
| 13. Cobre                | 14. Nitrógeno Kjeldhal             |
| 15. Cadmio               | 16. pH                             |
| 17. Mercurio             | 18. Plaguicidas Organoclorados     |
| 19. Níquel               | 20. Carbono orgánico total         |
| 21. Cromo                | 22. Detergentes Aniónicos          |
| 23. Plomo                | 24. Hidrocarburos (totales)        |
| 25. Cinc                 | 26. Fósforo Total                  |
| 27. Hierro               | 28. Fósforo de ortofosfato         |
| 29. Manganeso            | 30. Sólidos totales                |
| 31. Alcalinidad          | 32. Sólidos Suspendidos totales    |
| 33. Dureza total         | 34. Sólidos disueltos totales      |
| 35. Color                | 36. Toxicidad aguda <sup>(1)</sup> |
| 37. Sustancias Fenólicas | 38. Sílice                         |
| 39. D.Q.O.               | 40. Sulfatos                       |
| 41. Clorofila "A"        | 42. Boro                           |
| 43. Magnesio             | 44. Calcio                         |
| 45. Potasio              | 46. Sodio                          |

### b) Descripción de métodos analíticos

#### PARAMETROS DE CALIDAD Y TECNICAS ANALITICAS SUGERIDAS

PARÁMETRO	UNIDAD	LD	LC	TÉCNICA ANALÍTICA
<b>Parámetros Generales</b>				
Alcalinidad total	mg CaCO <sub>3</sub> /L	--	--	SM 20th. Mét:2320 B
Carbono orgánico total	mg C/L	--	--	Standard Methods 20th Met.5310 A y B Combustión alta temperatura



Cloruro	mg Cl/L	1,0	10,0	SM 20th. Mét:4500-Cl B
Color	UH	5	10	Kit Merck Cód. 14421
DBO <sub>5</sub>	mg O <sub>2</sub> /L	< 5,0	--	SM 20th Met.:5210 B
DQO	mg O <sub>2</sub> /L	20,0	30,0	SM 20th. Mét:5220 C
Dureza total	mg CaCO <sub>3</sub> /L	4,0	--	SM 20th. Mét:2340 C
Calcio	mg Ca/L	0,5	--	SM 20th Met.3500-Ca B
Magnesio	mg Mg/L	--	--	SM 20th Met.3500-Mg B
Cianuro	mg CN/L	0,002	0,02	SM 20th Met.4500-CN A,B,C,D y E
Fósforo Total	mg Ptot/l	0,005	0,10	SM 20th Met. 4500-P B y E
Fósforo-Ortofosfato	mg P-PO <sub>4</sub> /L	0,005	0,10	SM 20th. Mét:4500-P E
Nitrógeno-Amoniaco	mg N-NH <sub>3</sub> /L	0,02	0,20	SM 18th. Mét:4500-NH3 B y C
Nitrógeno -Nitrito	mg N-NO <sub>2</sub> /L	0,004	0,012	SM 20th Met.:4500 -NO2 B
Nitrógeno -Nitrato	mg N-NO <sub>3</sub> /L	0,1	1,0	SM 20th Met.4500 -NO3 B (UV)
Nitrógeno Total Kjeldhal	mg NTK/L	0,10	--	SM 20th. Mét:4500 Mod.s/Eq.Tecator AN N° 87/87-Des.1026 o SM 20th. Mét:4500 B
pH	UpH	--	--	SM 20th. Mét:4500 H ,B
Turbidez	UNT	0,1	2,0	SM 20th. Mét:2130 B
Detergentes (SAAM)	mg SAAM/L	0,006	10	SM 20 th. Mét: 5540 C
Coliformes totales	NMP	--	--	SM 20th Met.. 9221 B
Coliformes fecales	NMP	--	--	SM 20th Met. 9221 E
Coliformes Totales	UFC/100 ml	--	--	SM 20th. Mét.9222 B
Coliformes Fecales	UFC/100 ml	--	--	SM 20th Met..9222 D
Escherichia Coli	Pres-Aus./100 ml	--	--	SM 20th Met. 9221 B
Sólidos Suspendidos Totales	mg Sol. Susp. Tot/l	0,1	--	SM 20th Met. 2540 D
Sólidos Totales	mg Sol. Tot/l	0,1	--	SM 20th Met.2540 B
Sólid. Disuelt. Tot.	mg Sól.dis.Tot/ L	0,1	--	SM 20th Met. 2540 C
Sulfato	mg SO <sub>4</sub> /L	--	--	SM 20th Met. 4500 E (Turb.)
Toxicidad Aguda	CE 50 - 24 hs. % V / V	--	--	Determination of the inhibition of the mobility of <i>Daphnia Magna Straus</i> (Cladocera, Crustacea)- Acute toxicity test. ISO 6341 3 ed. 1996
Clorofila "A"	µg/L	--	--	SM 20th Met: 10200 H, Determinación espectrofotométrica o fluorométrica

### Compuestos Orgánicos

Hidrocarburos Tot.	mg Hc/L	0,6	20	EPA Mét: 418.1 (mod. a CCl <sub>4</sub> )
Fenoles	mg Fenoles/L	0,001	0,01	SM 20 th. Mét: 5530 A, B y C
Trihalometanos				
Cloroformo	µg/L	0,208	0,832	SM 20th Method 6200 B. Purge and Trap Capillary –Column Gas Chromathographic / Mass Spectrometric Method
Diclorobromometano	µg/L	0,200	0,800	
Dibromoclorometano	µg/L	0,400	1,60	
bromoformo	µg/L	0,450	1,80	

### PARAMETROS DE CALIDAD Y TECNICAS ANALITICAS SUGERIDAS (cont.)

PARÁMETRO	UNIDAD	LD	LC	TÉCNICA ANALÍTICA
<b>Metales pesados</b>				

Arsénico	µg As/L	1,4	4,5	EPA Mét: 7060 A ( Horno Graf.)
Boro	Mg B/L	0,10	0,25	SM 20th Met. 4500-B
Cadmio total	mg Cd/L	0,003	0,010	SM 20th. Mét:3111 A y D (Llama)
Cadmio total	µg Cd/L	0,1	--	SM 20th. Mét:3113 A y B ( Horno Graf.)
Cinc total	mg Zn/L	0,005	0,015	SM 20th. Mét:3111 A y B (Llama)
Cinc total	µg Zn/L	--	--	SM 20th. Mét:3113 A y B ( Horno Graf.)
Cobre total	mg Cu/L	0,003	0,010	SM 20th. Mét:3111 A y B (Llama)
Cobre total	µg Cu/L	0,3	--	SM 20th. Mét:3113 A y B ( Horno Graf.)
Cromo total	mg Cr/L	0,015	0,045	SM 20th. Mét:3111 A y D (Llama)
Cromo total	µg Cr/L	0,2	--	SM 20th. Mét:3113 A y B ( Horno Graf.)
Hierro total	mg Fe/L	0,040	0,070	SM 20th. Mét:3111 A y B (Llama)
Hierro total	µg Fe/L	--	--	SM 20th. Mét:3113 A y B ( Horno Graf.)
Manganeso total	mg Mn/L	0,004	0,014	SM 20th. Mét:3111 A y B (Llama)
Manganeso total	µg Mn/L	--	--	SM 20th. Mét:3113 A y B ( Horno Graf.)
Mercurio total	µg Hg/L	0,3	1,0	SM 20th. Mét:3112 B (Vapor Frio)
Níquel total	mg Ni/L	0,018	0,060	SM 20th. Mét:3111 A y B (Llama)
Níquel total	µg Ni/L	--	--	SM 20th. Mét:3113 A y B ( Horno Graf.)
Plomo total	mg Pb/L	0,030	0,100	SM 20th. Mét:3111 A y B (Llama)
Plomo total	µg Pb/L	0,8	--	SM 20th. Mét:3113 A y B ( Horno Graf.)
Sílice	mg SiO <sub>2</sub> /L	1,0	2,0	SM 20th Met. 4500-Si C
<b>Compuestos Organoclorados</b>				
Lindano	µg/L	0,027	0,032	EPA SW 846 3rd. Edition - Method 3510 C: Separatory Funnel Liquid-Liquid Extraction (Rev. 3, Dec. 1996) - Method 8081 B: Organochlorine Pesticides by Gas Chromatography (Rev. 2, Nov. 2000)
Heptacloro	µg/L	0,019	0,032	
Aldrin	µg/L	0,014	0,019	
Heptacloro Epóxido	µg/L	0,011	0,019	
Endosulfán I	µg/L	0,021	0,031	
Dieldrin	µg/L	0,005	0,009	
Endrin	µg/L	0,008	0,019	
Metoxicloro	µg/L	0,027	0,072	
Hexaclorobenceno	µg/L	0,009	0,010	
Clordano	µg/L	0,241	0,300	
4,4' -DDD	µg/L	0,007	0,019	
4,4' -DDE	µg/L	0,009	0,019	
4,4' -DDT	µg/L	0,010	0,019	

### 2.3.- Consideraciones

- Los valores definitivos de LD y LC deberán ser informados por cada institución que entregue información.
- Los parámetros propuestos en esta guía contemplan los principales usos de agua existentes en la cuenca: caracterización físico-química, abastecimiento de agua, dilución de aguas servidas, riego, navegación, pesca, generación de hidroelectricidad.

- Se considera de importancia, en las situaciones a ser previstas, determinar metales disueltos en forma paralela a la determinación de metales totales para su empleo en la determinación de la bio-disponibilidad de los mismos

### **3.- METODOLOGÍA DE CONTROL DE CALIDAD**

#### **3.1.- Custodia de la muestra**

El propósito del protocolo de custodia de la muestra es asegurar la trazabilidad en el acarreo y posesión de todas las muestras. El Laboratorio es responsable por la totalidad del proceso de la cadena de custodia, pero cada persona que mueve, transporta o analiza las muestras es responsable por el mantenimiento de la integridad del proceso.

- El laboratorio es responsable por la preparación de los envases de muestra adecuadamente limpios y preservados (en el caso que corresponda). El volumen de los envases y el tipo estarán de acuerdo a lo recomendado por las técnicas analíticas. El laboratorio se encargará de proveer los envases adecuados, blancos de traslado, preservadores, formularios para la cadena de custodia, conservadoras y material refrigerante.
- La persona encargada del muestreo es responsable de la *Custodia de la Muestra en Campo* y es llena las etiquetas de los envases de muestra con la siguiente información:
  1. Proyecto
  2. Identificación de la muestra/Ubicación
  3. Fecha y hora
  4. Parámetro
  5. Preservativo y pH final (si correspondiere)
  6. Identificación del responsable del muestreo

Cada muestra será sellada con un precinto de seguridad y colocada en una conservadora la cual será sellada con cinta. El responsable de muestreo debe completar una *Planilla de la Cadena de Custodia* la cual se encuentra en el **Anexo I**, y que contiene la siguiente información:

1. Firma del responsable de muestreo
2. Código de estación, ubicación, fecha y hora de muestreo, y análisis solicitado, número de precinto, y toda otra información que se considere importante.

La *Planilla de Cadena de Custodia* será transportada con la muestra al laboratorio. La custodia de la muestra será transferida firmando la *Planilla de Cadena de Custodia* en la sección transferencias como sigue:

1. Entrega: si la muestra es transferida a otra persona.
2. Recepción : si la muestra es recibida.

- El encargado de *Custodia del Laboratorio* examinará y registrará la condición de las muestras y la conservadora en la cual fueron enviadas. Se registrará la temperatura de la conservadora o la temperatura del "blanco de temperatura" en la *Cadena de Custodia*. Cualquier daño, rotura, filtración, u otra irregularidad será anotada en la planilla de *Cadena de Custodia*. La *Cadena de Custodia* debe ser una parte permanente de la recepción de muestras y el reporte de información.

Luego de su recepción, el laboratorio puede asignar un número de identificación propio. Inmediatamente después de recibidas, si no fueron preservadas en campo deben serlo y almacenadas o sometidas al procedimiento de análisis de acuerdo a la metodología aprobada. Aquellas muestras que requieran refrigeración serán colocadas en refrigeradores en el laboratorio. La temperatura de estos debe ser registrada cada día.

### 3.2.- Control de calidad del muestreo

A los efectos de mantener un control de calidad en todo el programa de muestreo, además de cumplir con los procedimientos estándar, se requiere presentar blancos para constatar posible contaminación durante el proceso de muestreo. De esta manera se podrán detectar errores sistemáticos o casuales que se produzcan desde el momento en que se toma la muestra hasta el análisis. Se tomara una serie de blancos cada diez muestras. En síntesis el control de calidad de las operaciones de muestreo constará de los siguientes elementos.

- Blancos de frasco: recipiente que antes de realizar el muestreo, será llenado con agua ultrapura, preservado de igual forma que las muestras de campo y enviado para su análisis como "blanco de frasco". Se detecta así cualquier contaminación del envase.
- Blancos de muestreador: Agua proveniente del ultimo enjuague del muestreador.
- Blanco de transporte y acarreo: Los frascos son llenados en laboratorio con agua ultrapura y son enviados al lugar de muestreo y retornados al laboratorio para su análisis. Estos frascos no son abiertos en ningún momento. Estos blancos sirven para comprobar contaminación atribuible al transporte y procedimientos de almacenamiento en campo. Sólo se harán blancos de transporte y acarreo en frascos de compuestos orgánicos.
- Blancos de campo: Se deben preparar "blancos de campo" llenando los recipientes de muestras con agua ultrapura en el lugar de muestreo y agregando el preservador correspondiente. Los frascos son cerrados herméticamente y transportados luego al laboratorio de igual forma que las muestras de agua.
- Duplicado de campo: dos muestras de un mismo punto tomada en idénticas condiciones, en distintos frascos. Sirve para determinar la repetibilidad a través de todo el proceso desde el muestreo hasta la obtención del resultado.

### 3.3.- Control de Calidad de Laboratorio

#### a) Elementos del Control de Calidad intra-Laboratorio

Se sugiere para aquellos laboratorios integrantes de la red y que no estén acreditados por norma ISO, que empleen el Control de Calidad para laboratorios analíticos sugerido por el programa GEMS-AGUA (Global Environmental Monitoring System-Water).

El programa de control de calidad de muestras de laboratorio incluirá también entre sus operaciones el análisis de diferentes tipos de muestras control.

- Muestra estándar: un patrón de un valor conocido que se encuentra en el medio de la curva de calibración y que no debe diferir del valor esperado en  $\pm 15\%$ . Se realiza el análisis de un patrón al inicio de una jornada de trabajo.
- Blanco de laboratorio: agua destilada de la calidad requerida para el análisis a la que se somete a todos los pasos de la determinación analítica.
- Blanco adicionado: blanco de laboratorio al que se le ha adicionado una cantidad de analito conocida.
- Muestra duplicada de laboratorio: dos submuestras tomadas de un mismo frasco que se someten a la misma determinación. Sirve para determinar la repetibilidad del análisis.
- Muestra duplicada adicionada: es una muestra duplicada, a una se le adiciona una cantidad conocida del analito a determinar y a la otra no. Sirve para determinar la recuperación del método.

#### b) Validación de Datos

Es el procedimiento sistemático de revisión de datos a través de un conjunto de criterios con la finalidad de asegurar la confiabilidad de los datos que serán usados en forma adecuada. La validación de datos consiste revisión de los datos y el chequeo del control de calidad y datos de análisis de las muestras con límites de aceptabilidad para verificar que los sistemas analíticos estuvieron bajo control y los métodos fueron apropiadamente empleados.

#### c) Control inter- laboratorio

La realización de ejercicios de control de calidad inter-Laboratorios es el complemento necesario para asegurar la trazabilidad de los resultados obtenidos, de forma tal de permitir el empleo de la información con la mayor certeza posible.

Consultar la posibilidad de que el CEPIS u otros laboratorios actúen como laboratorios de referencia para la cuenca.

#### **4.- INFORMACIÓN COMPLEMENTARIA**

A fin de una mejor interpretación, tratamiento y evaluación de los datos de calidad de aguas que resulten de los muestreos en la Red, se requiere el conocimiento de los siguientes aspectos:

a) Hidrológicos

- Caudal instantáneo, (m<sup>3</sup> /s)
- Caudal medio del día, cuando sea factible (m<sup>3</sup> /s)
- Ancho medio del río (m), en la transecta
- Profundidad del punto de muestreo (m)
- Condición del río (creciente / bajante)

b) Meteorología

Esta información se considera de importancia y su obtención queda a criterio del organismo responsable de la toma de muestra

- Temperatura del aire (°C) en el momento del muestreo
- Temperatura media estacional (°C)
- Presión atmosférica (Hectopascal)
- Intensidad de radiación solar o nubosidad
- Viento, velocidad (km /h) y dirección
- Precipitaciones acontecidas en la Cuenca previas y durante al muestreo

#### **5.- METODOLOGIA DE EVALUACION DE LA INFORMACION DE CALIDAD DE AGUA**

El análisis de la información a coleccionar se realizará a través de tratamiento estadístico que facilite las tareas de evaluación, caracterización del estado actual y evolución de los parámetros de C.A. y además la optimización del Programa de la red de monitoreo establecida.

##### **5.1.- Análisis de la evolución temporal y espacial**

Se efectuará sobre los parámetros más significativos de C.A. por estación y por río de la Cuenca.

Esta evaluación se efectuará a partir de la disponibilidad de los datos, presentándose los resultados a través del método gráfico de Box y Whisker u otro similar, para cada estación en función del tiempo (concentración del parámetro vs tiempo) y para cada río en función de la distancia de la estación a un punto de referencia a especificar en cada caso.

a) Evolución temporal por estación de monitoreo

Se deberán considerar todos los datos coleccionados durante doce campañas, determinándose los siguientes indicadores para cada una de ellas:

- Mediana (M),
- Máximo (Máx)
- Mínimo (Mín)
- Percentil 75% (N1)
- Percentil 25% (N2)
- Desviación Estándar (S)

b) Evolución espacial a lo largo del río

Se deberán considerar todos los datos coleccionados para cada estación a lo largo del programa de monitoreo, determinándose los indicadores estadísticos ya mencionados en el punto anterior para la confección del gráfico de Box y Whisker u otro similar.

##### **5.2. Objetivos de Calidad de Agua**

Se llevarán a cabo reuniones para seleccionar e implementar objetivos de Calidad de aguas adecuado a los usos potenciales de las mismas, en los cursos transfronterizos. Se tomaría como punto de partida la experiencia internacional.

### **5.3. Criterios para la optimización de la red de monitoreo**

Para la realización de estas tareas se requerirá contar con la información necesaria y suficiente a fin de poder aplicar técnicas estadísticas.

### **5.4. Identificación y tratamiento de áreas críticas**

Esta tarea se implementará a través de la detección de tendencias definidas en el comportamiento de los parámetros de interés de los usos, definidos en la Primera Reunión de Contrapartes Técnicas, y en el Programa de Acciones Concretas- Proyecto II-1, aprobado por Resolución N° 203 (XVII) y la posibilidad y conveniencia de la aplicación de modelos matemáticos al área en cuestión (tramos de río/subcuenca) en el entendimiento que el seguimiento de los parámetros que se definan como críticos en áreas bien localizadas de la Cuenca permitirían la adopción de las medidas correctivas que aseguren la preservación y mejoramiento del recurso.

## **6.- METODOLOGÍA DEL FLUJO DE INFORMACIÓN**

El esquema de flujo de información tiene como objetivo principal el de disponer de un mecanismo permanente de evaluación conjunta de la calidad de las aguas de la Cuenca.

Como tal, este esquema deberá ser ajustado periódicamente a fin de adecuarlo a las necesidades que se fueran detectando.

Las bases del esquema de información serán:

- a.- Informe de datos de campo y laboratorio.
- b.- Informe anual en el ámbito de la Cuenca.

La elaboración de éstos, requerirá a su vez la producción o adopción de criterios técnicos, elaboración de documentos sobre aspectos específicos y la organización de talleres o jornadas destinadas a la transferencia mutua de experiencias.

Para cada uno de los items mencionados se definen mecanismos de flujo de información. Paralelamente, se señala la conveniencia de mantener la figura del interlocutor para agilizar las consultas, lograr preacuerdos y coordinar actividades intermedias.

### **6.1 Informe de datos de campo y laboratorio**

Los generadores de información de calidad de aguas remitirán al CIC los datos de las estaciones operadas en su ámbito geográfico designado por los países, para el almacenamiento de la información y su procesamiento.

### **6.2 Informe Anual a nivel de Cuenca**

El CIC será el encargado de preparar el informe anual de la Cuenca con el apoyo institucional de los países. El informe anual contendrá la siguiente información:

- Datos por estación y campaña

Asimismo podrán incorporarse:

- Estadísticas descriptivas.
- Análisis de la evolución temporal y espacial.
- Índice de calidad de agua.
- Criterios para optimización de la red y programa de monitoreo.
- Identificación y tratamiento de áreas críticas.

En el Informe Final deberá constar el nombre de los generadores de datos de calidad de agua, de los laboratorios y de los representantes responsables técnicos del Grupo Calidad de Agua.

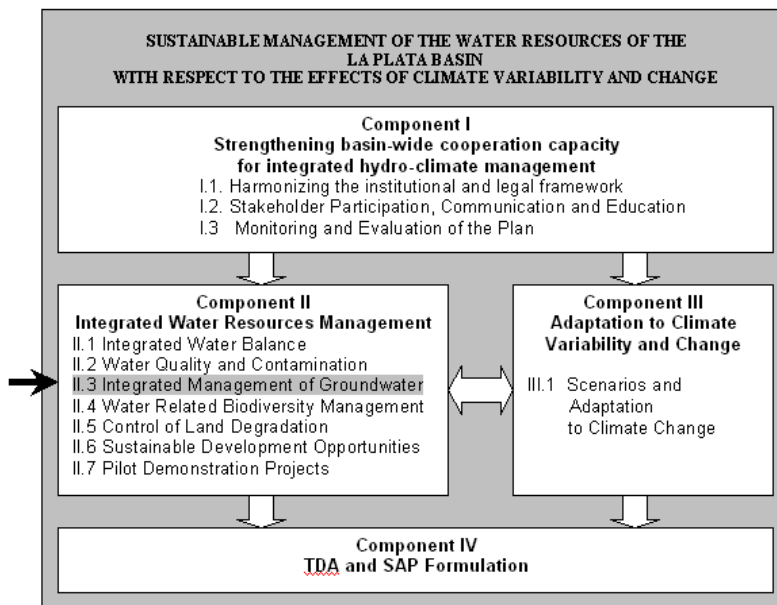
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## SUBCOMPONENT II.3 Integrated Management of Groundwater

### Part 1: Project Identifiers

1.1 Subcomponent: Integrated Management of Groundwater  
 1.2 Link to full project: Component II: Integrated Water Resources Management



1.3 Geographical scope: La Plata Basin  
 1.4 Executing Agency/entity: CIC in cooperation with the following national institutions:  
 Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.  
 Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.  
 Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).  
 Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.  
 Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).  
 1.5 Duration: 2.5 years  
 1.6 Focal area(s): IW  
 1.7 GEF grant: US\$ 1,018,800  
 1.8 Co-financing: US\$ 1,511,585  
 1.9 Total funding: US\$ 2,530,385  
 1.10 Associated financing: None  
 1.11 Contact person:

Miguel Angel López Arzamendia  
 Title: CIC Secretary General and Project Director  
 Tel: (54-11) 431 22 506  
 Email: [secretaria@ciplata.org](mailto:secretaria@ciplata.org)

1.12 Project summary: This subcomponent will seek to integrate groundwater considerations into the management of a major freshwater basin. This innovative approach to IWRM has been considered essential in view of the overarching need to better characterize aquifers and groundwater management practices in the La Plata Basin, facilitating the conjunctive management of surface and groundwater. This



subcomponent will provide the basis for future projects by assessing the impacts of increased climate variability and change in the water resources management, and especially in the subsurface water resources, while also identifying ways to mitigate the impacts their impact and elaborate adaptation strategies. The subcomponent activities will develop information and preliminary guidelines for the integrated management of the surface and groundwater resources of the LPB, based on the experiences and lessons learned emanating from the projects (i) “Management of the Yrendá Toba Tarijeño Aquifer System” (SAYTT, Activity 1) a large and relatively shallow aquifer within the semi-arid *Chaco area*; (ii) “Protection and Sustainable Use of the Guarani Aquifer System” a GEF funded project executed by World Bank and OAS/GS which largely coincides with the La Plata basin; and (iii) the UNESCO-OAS ISARM Americas Program. Activities to be executed under this sub-component will enable Plata Basin countries to introduce on-the-ground conjunctive management of surface and groundwater measures. This subcomponent includes two major activities:

- 1) Execution of the Priority activity “Sustainable Management of the Yrenda-Toba-Tarijeño Aquifer System – SAYTT (including the formulation of a specific Transboundary Diagnostic Analysis – TDA, and Strategic Action Program - SAP); and
- 2) Regional basin-wide reconnaissance of transboundary aquifers and harmonized guidelines for the integrated groundwater management in the La Plata Basin, including elaboration of a geo-referenced database of the main transboundary aquifers, integration of regional experiences through identification of implementation criteria and methodologies for experience transfer and validation of the proposed methodologies, and elaboration of guidelines for the integrated groundwater management.

The general outputs for this subcomponent includes a) TDA and SAP for the SAYTT, aimed at its sustainable use, protection of recharge areas, and water quality control; b) an inventory of the La Plata Basin transboundary aquifer systems (integrated into the CIC Information System) and a characterization of selected transboundary aquifers; and c) harmonized guidelines for the integrated management of surface and groundwater, based on the experience of the Guarani Aquifer and the SAYTT demonstration projects.

**Summary Table of Subcomponent Work Elements, Outputs and Outcomes**

Work Elements	Output	Outcome
II.3.1: Priority Activity “Sustainable Management of the SAYTT	A specific TDA and SAP for the SAYTT	By endorsing the TDA/SAP for the aquifer, the three countries sharing the aquifer system (Argentina, Bolivia and Paraguay) will have achieved a replicable experience on the management of a complex aquifer system in relation to surface water.
II.3.2: Aquifer inventory and management guidelines	An inventory of the La Plata Basin transboundary aquifer systems and guidelines for the integrated management of surface and ground waters	Countries sharing the La Plata Basin enabled to introduce on the ground conjunctive management of surface and groundwater measures throughout the basin.

**Summary Table of Subcomponent Work Elements Funding sources and Costs**

Work Elements	Sources of funding				Total Cost (US\$)
	GEF Funding (US\$)		Co-financing (#) (US\$)		
II.3.1: Priority Activity “Sustainable Management of the SAYTT	909,400	75.0%	500,000	25.0%	1,409,400
II.3.2: Aquifer inventory and management guidelines	109,400	5.0%	1,011,585	95.0%	1,120,985
<b>TOTAL</b>	<b>1,018,800</b>	<b>45.8%</b>	<b>1,511,585</b>	<b>55.0%</b>	<b>2,530,385</b>

## Part 2: subcomponent design

### 2.1 Background and context

**Background and introduction** The activities of this subcomponent were determined by the hydrogeological nature of the groundwater resources of the basin as a whole. The La Plata Basin is characterized by two main types of transboundary aquifers<sup>1</sup>: i) the deep, confined aquifers of the Guarani' type, present at various levels throughout the basin's subsurface; and ii) the large complex shallow (0-300m) often unconfined aquifer systems that occupy the subsurface of the vast plains extending approximately N-S along the Eastern flank of the Andes, including the Pantanal, the Gran Chaco Americano, and the Rio Salado – Rio Dulce plains.

The deep aquifers have little or no connection with the surface waters of the basin. On the other hand, the recharge areas of these aquifers, including the Guarani', coincides with vast areas of the Basin where the aquifer rocks outcrop at the surface. The protection of these recharge areas will hence be part of the overall "integrated" management of the basin. In general, the level of knowledge about these deeper resources is scarce, limited to localized areas where oil exploration and drilling of deep wells has occurred. The second type, the shallow aquifers, are in contrast intimately linked to surface waters, highly vulnerable to impacts of human activities, and the object of extensive exploitation throughout the basin.

The deep aquifers of the basin are already the subject of a major study (the Guarani Aquifer Project – World Bank/OAS) providing a considerable amount of information and extensive expertise and best practices for replication throughout the basin. The shallower aquifers, more vulnerable to human activities, are the focus of the present project, and in particular of Activity 1 of this subcomponent.

The II.2 subcomponent is articulated around two main working elements:

- 1) Priority activity for the integrated management in the transboundary Toba-Yrenda'-Tarijeno Aquifer System (SAYTT), located in the semi-arid zone of the Gran Chaco, and shared by Argentina, Bolivia and Paraguay. This major aquifer, identified as a priority by the UNESCO – OAS ISARM Americas Programme, exemplifies both the problems and the opportunities typical of "shallow" aquifers of the plains west of the Parana' river. This priority activity will include consideration of the impacts of climatic changes, and will work cooperatively with various on-going projects in the region.
- 2) Regional basin-wide reconnaissance of transboundary aquifers and harmonized guidelines for the integrated groundwater management in the La Plata Basin. It will include a preliminary inventory based on existing information of: (i) *deep aquifers* (with the exclusion of the Guarani, which is already the object of a specific project), complemented by a technical-economic assessment of selected exploitation scenarios. This activity will greatly benefit from exchanges with the Guarani' project team of experts. (ii) *major shallow aquifers* of the Pantanal – Gran Chaco – Pampa Humeda Occidental sub-Andean province, with focus on level of exploitation, groundwater dependent ecosystems, threats and hot spots of degradation. The UNESCO/OAS ISARM Americas program will provide essential information on the transboundary aquifers under this category. As part of this activity, a dissemination strategy aimed at replication of the experiences gained with the SAYTT priority activity in other relevant parts of the Plata Basin will be implemented.

*The case of the Yrenda-Toba-Tarijeño Transboundary Aquifer System (SAYTT).*

Extending approximately 352,000 km<sup>2</sup> (200,000 km<sup>2</sup> in Argentina, 32,000 km<sup>2</sup> in Bolivia, and 120,000 km<sup>2</sup> in Paraguay), the SAYTT is believed to represent one of the most important transboundary groundwater reservoirs in South America. It's entirely contained in the semiarid Chaco of Argentina, Bolivia, and Paraguay. The potential impacts of climatic changes (including increased desertification) in this socially vulnerable region (characterized by high poverty index values and the presence of indigenous communities) make the SAYTT a priority activity for the application of a sustainable and integrated management approach. In fact, approximately 80% of the population in the SAYTT area lacks access to drinking water. The average population growth rate in the region is 2.6%; however, the growth rate is larger (3.5% per year)

<sup>1</sup> A considerable number of the aquifers in the Plata Basin are transboundary

in the indigenous population of the central region of the Paraguay Chaco (which represents approximately half of the total population).

The Chaco region has been subjected to an intense desertification process due to uncontrolled exploitation of its natural resources, agricultural expansion and wasteful practices, and lack of water resources management. The precipitation gradient in the Chaco varies from 450 mm annually in the southwest to 1,200 mm annually in the east. The precipitation regime is highly seasonal, with 80% of the precipitation concentrated in the summer from October to April. During drought periods, there is an urgent need for water and a considerable increase of water-related contagious diseases.

In the Gran Chaco, the temperature increase between 2°C and 5°C expected at the global level would imply: (i) increased evaporation and likelihood of droughts and, (ii) increased risks of extreme events including more erratic rainfall and runoff patterns (increasing erosion problems).

A detailed assessment of these changes is beyond the scope of this project sub-component, especially because of the existing uncertainties in the characterization of the aquifer system. It is precisely the reduction in the uncertainties in the characterization that will be addressed in this project subcomponent. Once this is achieved or progress has been made in this respect, the assessment of the effects of climate variability and change will have to be addressed in a future project.

*The SAYTT Priority Activity Preparation Process.* At the First Coordination Workshop of the UNESCO/OAS ISARM Americas Program (Transboundary Aquifers of the Americas) held in Montevideo (Uruguay) in 2003, the transboundary, tri-national aquifer system Yrendá-Toba-Tarijeño (SAYTT), shared by Argentina, Bolivia and Paraguay, was proposed by the three countries as transboundary aquifer of priority concern for the possible implementation of a pilot project. The countries stressed that the SAYTT could represent a resource of vital importance, given its location in the Gran Chaco Sudamericano, a region where socio-economic development is limited by lack of water, with increasing ecosystem degradation processes.

The aquifer was already the subject of study and significant interest under the GEF project framework.<sup>2</sup> However, the interest was limited to the portion of hydrographic basin of the Bermejo River in Argentina and Bolivia. Because of the interest in the potential of SAYTT, on 16 - 17 of August, 2004, in the city of Tarija (Bolivia), the Bi-national Commission for the Development of Upper Bermejo River and Rio Grande de Tarija River Basins organized the "International Workshop on the Transboundary aquifer Yrendá - Toba-Tarijeño", within the framework of the UNEP/OAS Bermejo project, and under the auspices of UNESCO/OAS ISARM Americas Program.. The principle objective of the workshop was to define a working plan for the preparation of the Terms of Reference for the subproject ISARM/Américas "Sistema Acuífero Transfronterizo Yrendá-Toba-Tarijeño - SAYTT", within the "Groundwater" component of the framework program for sustainable management of water resources in the La Plata Basin.

The objective of the of the Priority Activity SAYTT – defined in the Tarija meeting includes the following:

- “The long-term objective of the subproject is to “guarantee a sustainable management of the water resources of the SAYTT, assuring the continuity of its replenishment and the maintenance of its water quality, and managing the risks to the aquifer associated with global climate change. This effort will involve the users and beneficiaries of the aquifer’s water.”
- Whereas, the short-term objective of the subproject is to assist the three countries in establishing basic legal and institutional framework for the sustainable management of the SAYTT as a part of the integrated management of water resources in the La Plata Basin.

The subproject will serve as a replicable example in the wider context of aquifers found in the La Plata Basin. The preparation of this component, including the focus on SAYTT, has been principally developed through funds provided by the Ministry of the Environment of Italy, which provided co-financing for the preparation phase of the La Plata Project on issues related to ground water resources, and its role in mitigating the impacts of climate change. In December 2004, a Technical Workshop was held in Asuncion (Paraguay), with the participation of several national and international experts, which identified the main problems and opportunities for the SAYTT proposal, and defined the main activities for the component "Transboundary Diagnostic Analysis (TDA)", focusing particularly on information gathering and the protection and sustainable management of groundwater resources, in consideration to the benefits and services they provide to nature and society.

<sup>2</sup> “Programa Estratégico de Acción de la Cuenca Binacional del Río Bermejo” (GEF/PNUMA/OEA)

During the course of the project preparation, three national reports and a preliminary synthesis of the aquifer system as a whole were developed based on existing data. In addition, several options for developing pilot demonstration projects were identified. With these guidelines and based on a preliminary transboundary diagnostic analysis, the main problems affecting the aquifer system were identified and the opportunities available were outlined. Additionally, a proposed program of activities related to the Transboundary Diagnostic Analysis was formulated, and three possible interventions in demonstration areas shared among countries were proposed.

Statement of Issues During the preparatory phase of the project, the following major issues, problems and opportunities of the SAYTT were identified:

- a) The main problem of the region is water scarcity, which is mostly due to natural causes (semi-arid climate), compounded by over-exploitation of groundwater (the main source of water for local populations), and lack of proper management of the land–water system. The lack of water is the limiting factor of social and economic development.
- b) The SAYTT aquifer, with its huge water potential, could play a key role in the sustainable development in the Chaco. Its strategic use and its integrated management with surface water and land is the objective of the sub-project.
- c) This priority activity will constitute an example to be replicated in all sub-Andean regions of the Plata Basin, both nationally and internationally.
- d) The recent catastrophic floods in the Argentina, and anomalous droughts, are evidence of increasing climatic fluctuations, and thus pose an additional challenge in the integrated management of the Basin. The SAYTT priority activity will attempt to demonstrate the role that groundwater, less climate dependent, can play in mitigating the impacts of climate change.

Based on existing knowledge, the main factors affecting the aquifer and the sub-project area are the following:

- a) Deforestation in the Chaco plain –causing land degradation, biodiversity loss, and raising of the water table, with associated extensive soil salinization;
- b) Deforestation in the piedmont areas – causing accelerated soil erosion, and decrease in water infiltration and groundwater recharge;
- c) Pollution – both point and non point source, linked with use of fertilizers and pesticides in agriculture, and to mining activities in the upper watersheds (Pilcomayo);
- d) Degradation of humid zones and wetlands – due to expansion of the agricultural frontier, with loss of ecosystem services.

All these phenomena have elements which can be local in nature, but with transboundary effects, requiring solutions based on the coordination and collaboration among the countries sharing the aquifer (e.g.: pollution in the upper Pilcomayo basin; contamination in recharge areas; upstream expansion of salinization; etc.).

A better, more sustainable utilization of the SAYTT water resources would be necessary to reverse these degradation trends. There are however numerous obstacles that are hindering efforts towards sustainability:

- a) Lack of sufficient knowledge of the natural system;
- b) Lack of adequate policies and institutional structures;
- c) The transboundary nature of the SAYTT;
- d) The existing sectoral approach in the exploitation of surface and groundwater, and the lack of integration with land use management.

The SAYTT priority activity aims at assisting the three countries of Argentina, Bolivia and Paraguay to overcome these obstacles and take the first steps towards integrated and joint management of this shared resource.

2.2 Subcomponent objective. The objective of sub-component II.2 is to develop and refine the practice of integrated Basin Management in the La Plata Basin. The activities to be conducted under this sub-component also include a series of actions aimed at the implementation of Integrated Groundwater Management in the La Plata Basin. Specific outputs for the subcomponent will be the development of best practices for conjunctive use of surface and ground water through the execution of a Priority activity for the Yrenda-Toba-Tarijano Transboundary Aquifer System (SAYTT), and a regional basin-wide reconnaissance

of transboundary aquifers and harmonized guidelines for the integrated groundwater management in the La Plata Basin.

2.2 subcomponent objective The objective of this sub-component is to assist the La Plata Basin countries to move towards an integrated management of both surface and groundwater resources of the Basin. This will be done by building on the results and experience gained through the Guarani' Aquifer Project (GEF-WB-OAS), the UNESCO/OAS ISARM Americas Programme, and by implementing a priority activity involving a major transboundary aquifer located within the Plata Basin: the Yrenda' – Toba – Tarijeno Aquifer System (Argentina, Bolivia, Paraguay). This aquifer is one of the priority transboundary aquifers identified by the ISARM Americas Programme.

2.3 Environmental benefits: The environmental benefits that will be accrued at the Plata Basin regional level, and at the level of the Gran Chaco, can be summarized as follows:

- The increased knowledge on the groundwater resources of the basin, and of their relations to surface water and ecosystems, will allow the introduction of basin-wide policies aimed at preserving the integrity of groundwater dependent ecosystems, in particular wetlands and humid zones, and of the services they provide.
- Improvements in groundwater quality through the protection of recharge areas and the management of the salinization processes linked to the peculiarities of the Plata basin groundwater.
- Reduction in water related diseases, and mitigation of the impacts of climate variability and change.
- Increased freshwater resource base, as new deeper groundwater resources will be assessed along the Andes foothills (SAYTT).

At the global level the groundwater component of the Plata Basin Project, together with the Guarani Aquifer Project, will represent possibly the most significant demonstration of IWRM in one of the main basins of the planet, where groundwater will contribute to conjunctive uses and climate change mitigation strategies.

2.4 Overall sub Component Outcomes: Integrated management of ground and surface water resources, with a direct impact on improving the quality of life of the population and the quality of the ecosystems of the La Plata.

2.5. Consistency of the sub-project with national/regional priorities and plans Within the countries of the La Plata Basin, there are few programs being developed dealing with the management of aquifers primarily associated with the supply of drinking water, irrigation and recreation. Moreover, all of the countries are dedicated to improving the living conditions of the neediest sectors of the population, with water quality as a key factor.

2.6 Consistency of the sub-component with the GEF strategies and its strategic programs. The sub-component is fully consistent with GEF4 IW Strategic Objective 1 "To foster international, multi-state cooperation on priority water concerns", and conforms to IW Strategic Program 3 "Balancing overuse and conflicting uses of water resources in transboundary surface and groundwater basins". The purpose of the groundwater component of the Plata Basin project is in fact to enable countries to agree on harmonized integrated surface-groundwater management policies to meet the needs for human consumption, agriculture, hydropower, freshwater ecosystems, and considering the mitigation of the impacts of climate change.

2.7 Coordination and linkages to the umbrella project activities and other related activities in the basin: This Subcomponent is one of the key links of the IWRM of the Basin as it concerns the implementation of actions linked to one of the critical transboundary issues. It ensures linkages to the umbrella Component II. Moreover, coordination of this subcomponent will take place under the supervision of the International Coordinator and will be linked directly to the development of the TDA and the SAP.

Other related activities in the basin:

- Environmental Protection and Sustainable Development of the Guarani Aquifer System. Groundwater of the Guarani Aquifer System, which is largely coincident with the La Plata Basin, is being protected with GEF support in agreement with the four countries which share it: Argentina,

Brazil, Paraguay and Uruguay. The Guarani aquifer is a groundwater reserve with an area of approximately 1.2 million squared kilometers, located almost entirely in the La Plata Basin. Of the total area of the aquifer, 64% lies on Brazilian territory, 23% in Argentina, 7 % in Paraguay and 6 % en Uruguay. The objective of the Project of Environmental Protection and Sustainable Development of the Guarani Aquifer system is supported by Argentina, Brazil, Paraguay, and Uruguay in the development and joint implementation of a model legal and institutional framework for the management and preservation of the Guarani Aquifer, bearing in mind the concerns of present and future generations. As a final result, the project is expected to enable the four countries to possess a management model for the SAG, through a Program of Strategic Actions-PSA, including technical, scientific, institutional, financial and legal resources for the protection and sustainable use of groundwater.

- Strategic Action Plan for the Bermejo River (SAP-Bermejo). The Binational Commission for the Bermejo River and Upper Tarija River (Argentina-Bolivia) is executing a project designed to promote sustainable environmental development of the basin and mitigate natural erosion phenomena exacerbated by human activities. The basin generates 80% of the sediment loads to the La Plata estuary limiting navigation and increasing transportation costs, to the detriment of the development of MERCOSUR.
- Implementation of Integrated Management Practices for the Water Resources of the Pantanal/Alto Paraguay. The government of Brazil through the Agencia Nacional de Aguas (ANA) is actively working in the development of a program for the integrated management of the water resources of the Upper Paraguay River Basin. Land use changes in this Basin affect the world's greatest wetland, the Pantanal, and its biodiversity. This natural reservoir regulates the whole hydrology of the La Plata Basin, retaining water during six months and minimizing potential flooding downstream.
- Sustainable Land Management in the Transboundary Ecosystem of the Gran Chaco Americano. This project although still in the PDF-B stage will be developing a Sub-regional Action Program for the sustainable development of the Gran Chaco Americano, within the legal framework of the Convention to Combat Desertification. This Project is being developed by Argentina, Bolivia and Paraguay and will help enhance the knowledge of this semi-arid region and provide remedial actions as input to the Plata TDA/SAP process.
- The ISARM Americas Program (Internationally Shared Aquifer Resources Management). This program is a regional initiative, developed by UNESCO-IHP and DSD/OAS with its central objective being the pursuit of greater scientific, socio-economic, legal, institutional, and environmental understanding relating to the management of transboundary aquifers in the Americas.
- In addition to those mentioned above, other projects, such as the EU funded Master Plan for the Pilcomayo River basin, are being executed without an integrated framework to ensure coherent efforts and an efficient use of human resources and financing. The proposed Plata initiative will look into coordinating all existing efforts under a consolidated management framework.

## 2.8 Incremental reasoning:

Baseline The countries in the basin are pursuing very few aquifer management programs, associated primarily with drinking water supply, irrigation and recreation. These programs are disjointed with no interaction between them. At national level:

- 1) In the Argentine provinces which form a part of the SAYTT, the Administraciones Provinciales del Agua is responsible for coordinating and evaluating the policies of maintaining and conserving the water resources. Amongst these provinces the following organizations should be mentioned: la Administración Provincial del Agua del Chaco, la Dirección de Recursos Hídricos de Formosa, la Dirección Provincial de Recursos Hídricos de Jujuy, la Agencia de Recursos Hídricos de Salta, la Administración Provincial de Recursos Hídricos de Santiago del Estero and la Dirección de Recursos Hídricos de Tucumán. Generally speaking, these are the agencies that play a role in planning the supply of water to their populations. In the provinces that have their drinking water services within their concession, the Public Service Regulatory Bodies are responsible for monitoring the supply of drinking water to the people.
- 2) In Bolivia there is no agency in charge of research, exploitation and conservation of groundwater resources but rather these responsibilities lie with the municipalities and the Prefecture, for the development of water resources in general, but there is no regulation controlling the exploitation and conservation. At the national level the Servicio Geológico Minero (SERGEOMIN), through its

Department of Hydrogeology, has published an hydrogeological map of Bolivia, which also includes the official national groundwater projects with external funding. This institution should be responsible for the investigation of groundwater resources, due to its experience in this kind of work in addition to its having specialized personnel. El Plan Nacional de Cuencas Hidrográficas (PLAMACH-BOL) is a strategic tool for the productive and sustainable management of water resources. Analyzes the potential benefits and problems and establishes a prioritization of actions and interventions at the river basin level.

- 3) In Paraguay, the Dirección General de Protección y Conservación de los Recursos Hídricos, within the Secretaría del Ambiente is currently the agency responsible for water resources, functioning under the law N° 1.561/2000, Art. 25 to: Develop, coordinate and evaluate policies for the maintenance and conservation of water resources and basins, ensuring the renewal process, maintaining the basic flow of stream flow, the ability to recharge aquifers, caring for different uses of water resources while preserving the ecological balance. The Directorate of Water Resources of Chaco is the only institution in Chaco that has the ability to investigate and provide services for drilling deep wells. This institution depends upon the administration of the Governorate of Boquerón. Its activities include countless local and regional studies in the field of hydrogeology.

Increment The project contributes to a higher objective set forth by the five signatory countries to the La Plata Basin Treaty--Argentina, Bolivia, Brazil, Paraguay and Uruguay--as coordination of actions and investment in the La Plata Basin for the sustainable management of its water resources, particularly related to the integrated management of surface and groundwater. A particular priority for the project is the creation of a model of harmonized cross-border resource management, on social, economic, technical and political levels which the three countries of the SAYTT will share. This model will provide a basis for developing Guidelines for Integrated Surface/Groundwater Management. The Guide will serve as a basis for decision making at the policy level and in other technical transboundary aquifers of the La Plata Basin and will be disseminated within the scope of the project UNESCO-OEA ISARM Americas. Also, it is intended that the results of projects and programs developed in the basin (with special attention to the Guarani Aquifer Project) and those dealing with the topic groundwater are integrated in the Guide and regionally broadcasted.

The increments will be: assembling, analyzing, and synthesizing the national information into and agreed upon regional database using a common framework. Thus the project will produce the global benefit of the optimal use of the resources, and along with that, an improvement in the quality of life and of the regional populations as well as the protection of the existing biodiversity, which is one of the world's most important reserves.

Incremental reasoning The participation of the GEF in this subcomponent implicates the agreement of the Basin countries to work together, with coordinated tasks, defining the availability of the resources and managing it in an integrated way. Taking a regional approach to the integrated management at basin level has been shown to be much more effective approach as compared with undertaking these actions on an individual or national basin.

## 2.9 Working Elements - Activities:

Objectives and outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<p>Objective: Assisting the countries sharing the Plata Basin to move towards the integrated groundwater management of both the surface water and the groundwater resources of the Basin, based on the experiences of the Guarani Project and the execution of the SAYTT Priority Project.</p>	Transboundary aquifers of the LPB are identified, characterized and mapped in GIS	<p>- Guarani GEF project scientific and technical information and Base Map (Sc. 1:100.000.000) with detailed maps at (Sc. 1:250.000), covering 2/3 of the LPB</p> <p>- Preliminary SAYTT information at the Bermejo GEF project and Pilcomayo EU project.</p>	Hydro-geologic base map for the LPB including transboundary aquifers (1.300.000km <sup>2</sup> , Sc. 1:100.000.000) and database, including detailed scientific and technical information needed for manage the SAYTT aquifer.	Base hydrogeological GIS map of the La Plata Basin transboundary aquifer systems and detailed maps (Sc. 1:250.000) for the SAYTT
	Surface and groundwater inventory	Surface and groundwater managed separately	Transboundary aquifers of the LPB are localized in a Map (Sc. 1: 100.000.000) using the Guarani Base Map input, including LPB superficial water system.	<p>A hydro-geologic database in GIS with the LPB transboundary aquifers and sub-basins is integrated into the CIC Information System.</p> <p>Assessments from Guarani aquifer system and the SAYTT activity include integrated surface and groundwater management practices</p>
	Groundwater management guidelines	Lessons learned from the Guarani GEF project	Atlas of LPB sub-basin aquifer contributes to the UNESCO-OAS-ISARM Americas program.	Guidelines for the integrated management of surface and ground waters in the La Plata Basin developed and adopted by the CIC.
<p>Outcome II.3.1</p> <p>SAYTT groundwater management guidelines address issues such as artificial recharge, protecting recharge areas, recharge continuity, and quality and conjunctive uses of surface and groundwater, which provide the basis of the</p>	<p>- A transboundary diagnostic analysis of the SAYTT agreed upon by the countries</p> <p>- A SAYTT Strategy includes climate change adaptation strategies, prepared and endorsed at ministerial level</p>	The ISARM Program has identified the SAYTT as one unique transboundary aquifer system.	SAYTT particular TDA input, for LPB TDA	SAYTT (352.000km <sup>2</sup> ) transboundary aquifer management plan included in the LPB's SAP



Objectives and outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
SAYTT groundwater strategy.				
Outcome II.3.2 The five riparian countries accept guidelines for integrated, basin-wide groundwater management of the LPB, inclusive of transboundary legal, institutional, and socio-economic situation	<ul style="list-style-type: none"> <li>- Adoption of a harmonized guidelines for the integrated management of surface and ground waters, based on the experience of the Guarani Aquifer and the SAYTT demonstration project.</li> <li>- An assessment of priority aquifers for the implementation of the conceptual framework, and a characterization of selected transboundary aquifers, completed.</li> </ul>	Fragmented actions on groundwater management, not integrated into a basin management framework.	<p>Draft guidelines for surface and ground water integrated management. LPB base Map (Sc. 1: 100.000.000) completed using the Guaraní Map input including LPB superficial water system and localized transboundary aquifers.</p> <p>Atlas of LPB sub-basin aquifer contributes to the UNESCO-OAS-ISARM Americas program. -Assessments from Guarani aquifer system and the SAYTT activity include integrated surface and groundwater management practices</p>	<p>Hydro-geologic database in GIS with the LPB transboundary aquifers and sub-basins</p> <p>Harmonized guidelines for the integrated management of surface and ground waters are accepted at the CIC.</p>

This Sub-Component consists of two main working elements:

1. Execution of a priority activity for the SAYTT, including the formulation of a specific Transboundary Diagnostic Analysis and Strategic Action Plan
2. Regional basin-wide knowledge of transboundary aquifers and harmonized guidelines for the integrated groundwater management in the La Plata Basin based on the experience of the Guarani Aquifer and the SAYTT demonstration project.

#### **Working Element II.3.1: Priority Activity “Sustainable Management of the Yrenda-Toba-Tarijeño Aquifer System – SAYTT Information**

*Objective:* To assist the three countries in establishing basic legal and institutional techniques for the sustainable management of the SAYTT as a part of the integrated management of water resources in the La Plata Basin.

*Outcome:* SAYTT groundwater management guidelines address issues such as artificial recharge, protecting recharge areas, recharge continuity, and quality and conjunctive uses of surface and groundwater, which provide the basis of the SAYTT groundwater strategy.

*Output II.3.1 Priority Activity:* Sustainable Management of the Yrendá –Toba-Tarijeno Aquifer (SAYTT) system

- Activities**
- a) Establish technical coordination unit
  - b) Conduct a transboundary hydro-geologic analysis
  - c) Analyze the transboundary groundwater legal, institutional and socio-economic situation
  - d) Conduct consultations and synthesize information
  - e) Prepare a SAYTT strategy
  - f) Prepare and execute a SAYTT pilot demonstration

Work Element objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output Priority Activity: Sustainable Management of the Yrenda – Toba-Tarijeno Aquifer (SAYTT) system	Trinational Coordination Unit (Ar, Bo, Py) in the framework of CIC.  - Transboundary diagnostic analysis of the SAYTT agreed upon by the countries  - SAYTT mgmt. strategy includes climate change adaptation actions, prepared and endorsed at ministerial level.  - Identification of 3 strategic pilot project activities related to climate change adaptation in the Chaco area.	Identification of the SAYTT as a unique transboundary aquifer system by the ISARM program	SAYTT particular TDA input, for LPB TDA	SAYTT (352.000km <sup>2</sup> ) transboundary aquifer management plan included in the LPB's SAP
<b>a) Establish technical coordination unit</b>				
<ul style="list-style-type: none"> <li>▪ Establishment of the Priority Activity Coordination Unit, with the participation of the three countries.</li> <li>▪ This unit will be responsible for implementing all of the activities of the project and may form the initial nucleus, within the CIC, of a future Trinational Commission.</li> <li>▪ The unit will respond to an interministerial committee, consisting of senior officials of key ministries (Water, Agriculture, Finance, Planning and so on.) from the three countries, coordinated by the CIC. This activity is very important because it serves, among others, to create an initial plan of joint management</li> </ul>				
<b>b) Conduct a transboundary hydro-geologic analysis</b>				
<p>TDA: geoscientific investigations. A need to establish a shared knowledge base for the SAYTT and to strengthen capacity. The objective of this action is to try to clarify some critical issues and, through the completion of the project, establish a capacity and a general framework of reference for countries to follow in a systematic manner in their investigative efforts.</p> <p>The specific actions to be carried out are the following:</p> <ul style="list-style-type: none"> <li>▪ Preliminary limitations for the recharge areas, and training in the subject;</li> <li>▪ Preliminary assessment of the vulnerability of the SAYTT, and training;</li> <li>▪ Definition of the age of groundwater of the different aquifers within the shared system, in particular the deepest (isotopes), and training;</li> <li>▪ Review of existing information on the deep aquifers (location, size, quality etc.), Also using data from oil exploration, reinterpreting geophysical profiles, data from wells, etc.;</li> </ul>				

- Inventory of the most important wetlands, and its relationship with the SAYTT, coordination and complementation with other existing projects, such as projects Pilcomayo, Bermejo and Gran Chaco Americano;
- Establishment of an experimental monitoring network, using existing wells, and training;
- Definition of a research program to be carried out by the three countries in a systematic way to follow up on what started as part of the project, in coordination with other GEF projects in the region;
- Analysis of climate fluctuations in the last few decades, and their local and regional impacts, in coordination with the work of the Framework Program conducted throughout the La Plata Basin under the CIC.

#### c) Analyze the transboundary groundwater legal, institutional and socio-economic situation

- TDA: Analysis of legal, institutional and socio-economic conditions, as they relate to groundwater.
- During the preparation, it has become evident that there exists a lack, or the extreme heterogeneity of existing legislation, institutional failures and participatory systems.
- The project will undergo a thorough analysis of the situation and the results already achieved in previous efforts (e.g. Project PSA-Bermejo), and will take action to inform participants at all levels (workshops) in order to proceed with the necessary reforms.

#### d) Conduct consultations and synthesize information

TDA: consultation and synthesis. Based on the foregoing, the preliminary TDA will be updated, during the preparation phase through a participatory system and with extensive consultations. This process will produce the final TDA because of a consensus among the three countries and civil society on the following points:

- (i) what are the main factors affecting the SAYTT and its priorities (i.e.: deforestation, pollution, etc.).
- (ii) Which of these factors require joint action of the three countries to mitigate the problems (i.e. cross-border problems)
- (iii) what are the opportunities for development presented by the SAYTT (i.e. deep aquifers, artificial recharge, strategic reserves to mitigate droughts? Etc.).
- (iv) What are the actions (at the national level and bi or tri-national levels) for the alleviation of degradation, and the development of the potential of SAYTT, and its priorities? These actions will necessarily be of two types: legal and institutional reforms and investments (i.e. exploration / research; re-forestation; infrastructure schemes for artificial recharge, wells etc.).

The EDA will be a consensus document, a product of the work of regional experts, approved by the Interministerial Committee and the CIC. This participatory process should be related to the Plan of Public Participation to be structured in the La Plata Basin, in which framework will be defined as well as criteria for the participation in agreements as desired by the countries.

#### e) Prepare a SAYTT strategy

SAYTT Strategic Action Program – SAP.

Based on the TDA, the program will achieve consensus on the actions (reforms and investments) identified in the TDA that countries agree to implement in order to achieve sustainable development of SAYTT. Some of these operations are purely domestic, while others will have an international character. Examples of possible strategic actions could include:

- The creation of a Trinational Commission
- A unified monitoring system
- Harmonized Laws
- Programs of joint geoscientific investigation
- A joint program of exploratory drilling
- A common strategy, agreed to at the CIC level, for mitigating the impacts of climate change
- A specific SAYTT SAP to be considered and included in LPB SAP preparation.

These actions will be identified because of a participatory process to be integrated into the wider context of the SAP for the La Plata Basin, and must be approved by the Committee and by the CIC, and endorsed by the governments.

#### f) Prepare and execute a SAYTT pilot demonstration

Pilot Demonstration(s)

Three possible cases were identified during the preparatory phase of the project. The final selection will be the responsibility of the Interministerial Committee, based upon a participatory process of selection, by the Management Unit. The objective will be to demonstrate practices / technologies that could be applied to improve resource management, while strengthening the capacity of countries.

In the choice of the Pilot Demonstration(s), emphasis will be placed on the issue to be addressed and on the practice/technology to be demonstrated, rather than its location within the aquifer (single country versus binational/trinational).

### **Working Element II.3.2 Regional basin-wide reconnaissance of transboundary aquifers and harmonized guidelines for the integrated groundwater management in the La Plata Basin**

- Objective:** Develop and refine the practice of integrated Basin Management in the La Plata Basin
- Outcome:** The five riparian countries accept guidelines for integrated, basin-wide groundwater management of the LPB, inclusive of transboundary legal, institutional, and socio-economic situation
- Output** Guidelines for integrated basin-wide groundwater management of the LPB
- Activities:**
- Conduct transboundary hydro-geologic analysis for the entire basin
  - Characterize basin aquifers
  - Integrate regional experiences
  - Prepare guidelines for conjunctive management of surface and groundwater

Work Element objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output Guidelines for integrated basin-wide groundwater management of the LPB	Groundwater management guidelines	Lessons learned from the Guaraní GEF project	Draft guidelines for surface and ground water integrated management.  LPB base Map including LPB superficial water system and localized transboundary aquifers.	Hydro-geologic database in GIS with the LPB transboundary aquifers and sub-basins  Harmonized guidelines Guidelines for the integrated management of surface and ground waters in the La Plata Basin developed and adopted by the CIC.
<b>a) Conduct transboundary hydro-geologic analysis for the entire basin</b>				
Elaboration of geo-referenced database of the main transboundary aquifers located in the La Plata Basin, integrated into the CIC Information System. Existing information of the main transboundary aquifers, including maps, will be collected and uploaded in the CIC LPB georeferenced database.				
<b>b) Characterize basin aquifers</b>				
Characterization of selected transboundary aquifers. Selected transboundary aquifers will be characterized according to their geoscientific and environmental aspects, and legal-institutional and socio-economic issues, in order to identify critical areas for future interventions, possible sources of contamination, potential water use conflicts, etc.				
<b>c) Integrate regional experiences</b>				
Integration of regional experiences. Regional experiences, such that of the SAYTT priority activity and of the Guaraní, will be discussed in two workshops so as to identify implementation criteria and proposed methodologies to be transferred and replicated. National and/or regional experiences and methodologies, whose applications have been proved effective, will be validated for replication in the La Plata Basin. Emphasis will be placed on the dissemination and replication of the results achieved with the SAYTT (Activity 1).				
<b>d) Prepare guidelines for conjunctive management of surface and groundwater</b>				
Elaboration of Guidelines for the integrated management of the transboundary aquifers of the La Plata Basin. Based on the experience being provided by the Guaraní Project and the SAYTT Priority Project, a guideline for the integrated management of groundwater will be developed. The Guidelines will include methodologies and techniques applied in the joint management of surface and groundwater.				

#### **Budget:**

## Co-financing

Sources of Co-financing	Type of Co-financing	Amount
Government Contribution	In-Kind	\$1,183,585
UNESCO-ISARM Américas (II.3 – Integrated Management of Groundwater)	In-Kind	\$28.000
Technical Office of Pilcomayo and Bermejo Rivers – Bolivia (II.3.2. SAYTT priority project)	In-kind/in-cash	\$300.000

## GEF Budget

Concept	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200 Consultants	76,744	14,581	33,767	39,907	0	165,000
2200 Sub contracts with institutions	78,800	195,000	265,000	130,000	0	668,800
3200 Workshops and Training	45,000	10,000	30,000	45,000	0	130,000
4100 Teams and Supplies	25,000	30,000	0	0	0	55,000
<b>Total</b>	<b>225,544</b>	<b>249,581</b>	<b>328,767</b>	<b>214,907</b>	<b>0</b>	<b>1,018, 800</b>

## Consultants to be hired for the project

Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
Local Technical Assistance			
Consultant 1	750	67	Design and assistance of the Project Office
Consultant 2	750	34	Analysis of the legal, institutional, and socio-economic frameworks
Consultant 3	750	40	Creation of the TDA
Consultant 4	750	40	Creation of the SAP
Consultant 5	750	40	Assistance with the Pilot Programs
Consultant 6	750	27	Design of the Database of the Transboundary Aquifers and its maintenance
Consultant 7	750	27	Analysis and integration of the regional experiences
Consultant 8	750	14	Guide for the integrated management of the water of the aquifers and for their surface water

See TdR in Annex 3.

## Sub contracts with Institutions to be hired for the project

Sub contracts	Tasks to be performed	Amount
Subcontract 1	<ul style="list-style-type: none"> <li>• Preliminary limitations for the recharge areas, and training in the subject;</li> <li>• Preliminary assessment of the vulnerability of the SAYTT, and training;</li> <li>• Definition of the age of groundwater of the different aquifers within the shared system, in particular the deepest (isotopes), and training;</li> <li>• Review of existing information on the deep aquifers (location, size, quality etc.), Also using data from oil exploration, reinterpreting geophysical profiles, data from wells, etc.;</li> <li>• Inventory of the most important wetlands, and its relationship with the SAYTT, coordination and complementation with other existing projects, such</li> </ul>	\$340.000

Sub contracts	Tasks to be performed	Amount
	as projects Pilcomayo, Bermejo and Gran Chaco Americano; <ul style="list-style-type: none"> <li>Establishment of an experimental monitoring network, using existing wells, and training;</li> <li>Definition of a research program to be carried out by the three countries in a systematic way to follow up on what started as part of the project, in coordination with other GEF projects in the region;</li> <li>Analysis of climate fluctuations in the last few decades, and their local and regional impacts, in coordination with the work of the Framework Program conducted throughout the La Plata Basin under the CIC.</li> </ul>	
Subcontract 2	Execution of the Pilot Projects	\$260.000
Subcontract 3	Analysis of the regional experiences in the management of the aquifers	\$60.000

## 2.11 Timetable:

Nombre de tarea	2008		2009		2010		2011		2012		2013
	M2	M1	M2	M1	M2	M1	M2	M1	M2	M1	
<b>II.3-Integrated Management of Groundwater</b>	[Gantt chart showing overall project duration from 2008 to 2013]										
<b>II.3.1-Priority Project "Sustainable Management of the Yrenda-Toba-Tarijeño Aquifer System – SAYTT"</b>	[Gantt chart showing sub-project duration from 2008 to 2011]										
II.3.1.A.-Establishment of the Priority Project Coordination Unit											
II.3.1.B.-TDA: geoscientific investigations											
II.3.1.C.-TDA: analysis of legal, institutional and socio-economic conditions related to groundwater											
II.3.1.D.-TDA: consultation and synthesis											
II.3.1.E.-SAYTT Strategic Action Program – SAP											
II.3.1.F.-Pilot Demonstration(s)											
<b>II.3.2-Regional basin-wide reconnaissance of transboundary aquifers and harmonized methodology for the integrated gr</b>	[Gantt chart showing sub-project duration from 2008 to 2013]										
II.3.2.A.-Elaboration of geo-referenced database of the main transboundary aquifers located in the La Plata Basin, integrated											
II.3.2.B.-Characterization of selected transboundary aquifers											
II.3.2.C.-Integration of regional experiences											
II.3.2.D.-Elaboration of Guidelines for the integrated management of the transboundary aquifers of the la Plata Basin.											

**2.12 Cost effectiveness:** The sub-component will be largely executed by national experts acting within the context of relevant national institutions, agencies and academia. This in itself will enhance the cost-effectiveness of this sub-component if compared with the alternative approach of sub-contracting services to specialized firms. In this way in fact, while achieving its intended outcomes, the sub-component will contribute to the strengthening of local institutions and capacities, thus contributing to the overall sustainability beyond the life of the project of the initiative. More will be achieved with the resources invested in the sub-component than what specifically expected.

## 2.13 Risk Analysis

Risk	Rating (L/M/H)	Risk Mitigation Measures
Lack of political support from SAYTT countries will hinder efforts to define and adopt the SAP at governments level	M	Full involvement of national experts and institutions in the execution of the sub-component
Groundwater considerations not fully integrated into the policies of the CIC at the Plata basin level	M	Dissemination of the combined results of the SAYTT, Guarani' Project and UNESCO-OAS ISARM Program.

**2.14 Sustainability:** The outcomes of the sub-component will be subsumed under the overall CIC fields of responsibility thus contributing to ensure that groundwater issues will be part of basin wide planning beyond the life of the project. Moreover, project activities and implementation (including the public involvement and stakeholder participation process) will be responsibility of national entities and experts, building consensus and capacity.

**2.15 Replicability:** The result of the Project will be disseminated through governmental institutions, nongovernmental organizations, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including the institutions in each of the five countries, will permit the development of information transfer mechanisms to share new knowledge and provide for active coordination and horizontal cooperation in the integrated management of the water resources of the Basin.

The priority activity has regional relevance in the basin, and the obtained good practices will be easily adopted basin-wide through the dissemination process.

Since all of the proposed activities are multifaceted in nature and include a strong multi-stakeholder participation element which will contribute to the “buy-in” of the project constituencies, the prospects for replicating such activities are high and can be achieved with minimal efforts exchanging relevant information and experience learned.

**2.16 Execution arrangement: National Executing Agencies and National Project Units:**

Argentina – SSRH, INASLA and CRAS-INA

Bolivia – Servicio Geológico Técnico de Minas (SERGEOTECMIN) and the Dept. of Hydrogeology of SENAMHI

Brasil – Secretaría de Recursos Hídricos/Ministerio do Meio Ambiente, Agencia Nacional de Águas, IBAMA, Ministério das Cidades, and the Serviço Geológico Brasileiro (CPRM)

Paraguay – Secretaría del Ambiente (SEAM), Dirección General de Protección y Conservación de los Recursos Hídricos, the Boqueron Government, and the Dirección de Recursos Hídricos del Chaco

Uruguay – Dirección Nacional de Medio Ambiente, Dirección Nacional de Hidrografía and Dirección Nacional de Agua y Saneamiento.

A Consortium will be formed to implement the Project according to the results of workshops carried out in Tarija (August 2004), Asunción (November – December 2004) and Buenos Aires (May 2005) among the interested organizations and representatives of Non Governmental Organization which participated in these meetings.

**2.17 Public participation mechanisms** The participative dimension strengthens Basin governance, and is present in each of the activities to be executed during the project. Promoting public participation in this project is integral and transversal to the process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society—with special focus on gender equity and indigenous peoples. This involvement also will facilitate the social sustainability of the action plan during both its formulation and implementation, consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

**2.18 M&E:** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed Monitoring and Evaluation Plan (Component I), will be further elaborated by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management)

**PROCESS OUTCOMES AND INDICATORS**

Process OUTCOMES		Process INDICATORS	
Project		Project	
Multi-country agreement on transboundary priority concerns, impacts and causes		<ul style="list-style-type: none"> <li>- A basin-wide guideline on Integrated Surface and Groundwater Management for the five La Plata River Basin countries prepared in draft by year 3 and adopted by the by the end of the Project .</li> <li>- Database of transboundary aquifers and sub-basins of the La Plata River Basin established within CIC by the 3rd year.</li> <li>- TDA for the SAYTT Water Resources management, addressing issues such as artificial recharge, protection of recharge areas recharge continuity and quality</li> </ul>	

Process OUTCOMES			Process INDICATORS
Project			Project
			maintenance, conjunctive uses and participatory mechanisms, prepared and agreed upon by the three countries sharing the aquifer, by the end of year 3..
Multi-country agreement on governance reforms and investments to address priority transboundary concerns			- The SAP for the SAYTT endorsed at ministerial level, and integrated into the overall Plata basin SAP by the end of the Project.
Effective national Inter-ministry Coordination			- Inter-ministerial bodies guide the TDA-SAP process in the SAYTT countries. - Country representatives responsible for the management of the SAYTT priority activity selected through inter-ministerial process by the end of the 3 <sup>rd</sup> month.
Newly established and/or strengthened (existing) transboundary waters institutions			- Cooperation and consultation mechanisms among SAYTT countries established by the end of the 3 <sup>rd</sup> month.



## ANNEXES

## Annex 1: Location map of SAYTT



## Annex 2: Terms of Reference for Consultants

**Consultant 1****Objective:**

Design and assist the Project Office

**Activities:**

The consultant must define the structure of the Project Office.

The consultant must participate in the functioning of that office for 12 months.

**Results:**

The Project Office in place and its normal functioning achieved during the course of 12 months.

**Duration**

The duration for this task is 12 months.

**Consultant 2****Objective:**

Analysis of the legal, institutional and socioeconomic framework

**Activities:**

The consultant must analyze the laws in force in the 3 countries which refer to the management of water resources and particularly to groundwater.

The consultant must establish, in agreement with the institutional rules of each country, which institutions are involved in the theme.

The consultant must propose a legal framework to regulate action jointly with the countries in the management of the shared aquifer.

**Results:**

Identification of all actors involved and a proposal for a framework to regulate the activities of the countries

in the management of the aquifer.

**Duration:**

The duration for this task is 6 months.

**Consultant 3**

**Objective::**

Development of the ADT

**Activities:**

The consultant must update the preliminary ADT, made during the preparation phase, with a participatory system and extensive consultations to achieve consensus among the 3 countries and civil society.

The consultant must accomplish inter alia, the following tasks:

Identify the main factors affecting the SAYTT, and its priority (i.e.: deforestation, pollution, etc.).

Identify which of these factors require joint action by the three countries to mitigate (i.e. cross-border problems).

Identify what are the opportunities for development presented by the SAYTT (i.e. deep aquifers, artificial recharge, and strategic reserves to mitigate droughts, among others)

Propose actions (at the national level and bi - or tri-national) for the alleviation of degradation, and developing the potential of SAYTT, and its priority. These actions will necessarily be of two types: legal and institutional reforms and investments (i.e. exploration / research re: forestation; infrastructure schemes of artificial recharge, wells etc.).

**Results:**

The outcome of this task will be the definition of a consensus ADT document, a product of the work of regional experts, approved by the Interministerial Committee and the CIC. This participatory process should be related to the Public Participation Plan to be structured in the La Plata Basin, which will define a framework and criteria for the participation agreements available to the countries.

**Duration::**

The duration for this task is 12 months.

**Consultant 4**

**Objective::**

Development of the SAP

**Activities:**

The Consultant shall reach an approved ADT with the countries and civil society, from which the countries may derive the reforms and investments that they decide to run.

The consultant's analysis should identify actions to be implemented in agreement with the countries which may include without limitation:

- The creation of a Trinational Commission
- A unified monitoring system
- Harmonized Laws
- Geoscientific joint investigation programs
- A joint program of exploratory drilling

A common strategy agreed to at the CIC level for mitigating the impacts of climate change.

These actions will be identified as a result of a participatory process to be integrated into the wider context of the PAE of the La Plata Basin, and the consultant should support the process so that the programs may achieve CIC consideration, and be endorsed by the governments of each country.

**Results:**

As a result of this task, a consensus approved PAE document will be defined for the parties so as to identified actions can be carried through by the countries.

**Duration:**

The duration for this task is 12 months.

**Consultant 5**

**Objective:**

Technical assistance with the pilot projects

**Activities:**

The activities that this consultant should develop will be defined based on three possible cases which were identified during the preparatory phase of the project. The final selection of the pilot projects will be the responsibility of the Inter-ministerial Committee, based on a selection process carried out by the Management Group. The objective will be to demonstrate practices/technologies which could be applied to improve the management of resources, at the same time strengthening the countries' capacities.

In the choice of the Pilot Demonstration(s), emphasis will be placed on the issue to be addressed and on the practice/technology to be demonstrated, rather than its location within the aquifer (single country versus binational/trinational).

After a choice is ultimately made, the consultant will provide support by organizing the task and defining the development strategy and activities to pursue to achieve the goals

**Results:**

The result of this work will be the establishment of the activities to be carried out in the PP.

**Duration**

The duration for this task is 24 months divided into segments.

**Consultant 6**

**Objective::**

Design and implementation of the transboundary aquifers database and it's maintenance

**Activities:**

The consultant must develop a geo-referenced database of the main transboundary aquifers located in the La Plata Basin, integrated into the CIC Information System.

Existing information of the main transboundary aquifers, including maps, will be collected and uploaded in the CIC LPB georeferenced database.

At the same time the consultant must propose the method by which the database will be maintained. .

The consultant will count on the support of the CIC and of the countries to define their objectives.

**Results:**

The result of this work will be availability of the database of the principle aquifers and the processes which need to be followed to keep the database updated.

**Duration:**

The duration for this task will be 48 months.

**Consultant 7**

**Objective::**

Analysis and integration of the regional experiences

**Activities:**

The consultant will develop programming of the analysis of the regional experience such that of the SAYTT priority activity and of the Guarani, to be discussed in two workshops, to identify implementation criteria and proposed methodologies to be transferred and replicated. National and/or regional experiences and methodologies, whose applications have been proved effective, will be validated for replication in the La Plata Basin. Emphasis will be placed on the dissemination and replication of the results achieved with the SAYTT (Activity 1).

**Results:**

The result of this task will be the availability of a document that summarizes the experiences gained and the recommendations for their future implementation in the management of aquifers.

**Duration::**

The time frame of this task will be 6 months.

**Consultant 8**

**Objective::**

Guide for the integrated management of the aquifer water and their surroundings

**Activities:**

Elaboration of Guidelines for the integrated management of the transboundary aquifers of the La Plata Basin.

Based on the experience provided by the Guarani Project and the SAYTT Priority Project, guidelines for integrated management of groundwater will be developed. The Guidelines will include methodologies and techniques applied in the integrated management of surface and groundwater, as specific measures to adopt in a regional strategy for climate change adaptation.

**Results:**

The result of this task will be the availability of a Methodological Guide for the management of efficient aquifers, considering the relationship between surface and groundwater.

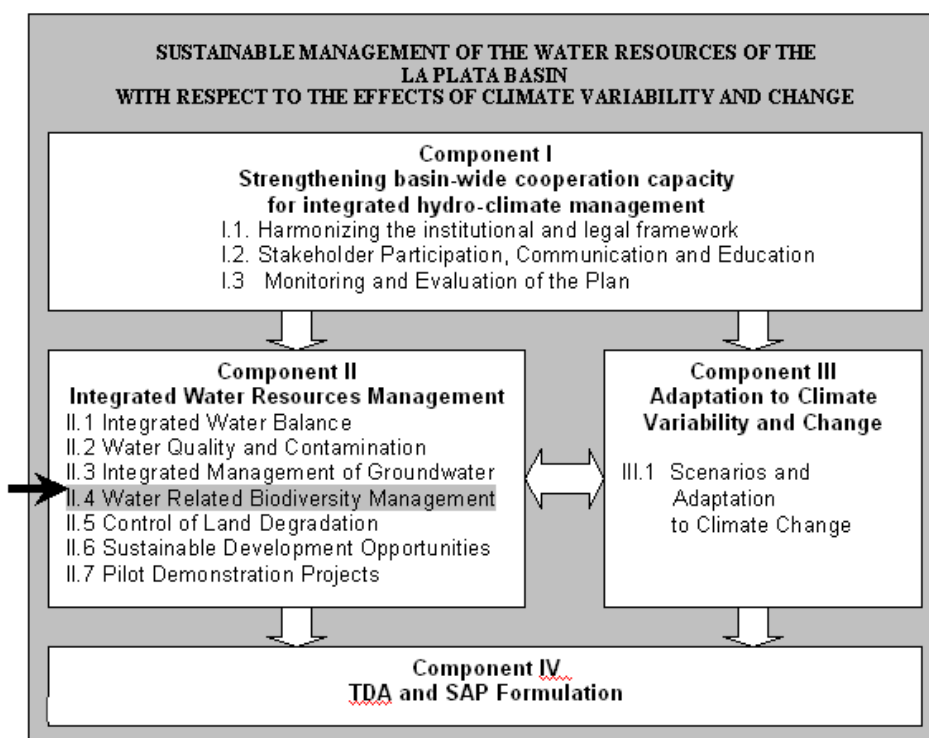
**Duration:**

The time frame of this task will be 6 months.

**SUBCOMPONENT**  
**II.4**  
**Water Related Biodiversity Management**

**Part 1: Project Identifiers**

- 1.1 Sub-project title: Water Related Biodiversity Management  
1.2 Link to umbrella project: Component II: Integrated Water Resources Management



1.3 Geographical scope: LPB

1.4 Executing Agency/entity: CIC in cooperation with the following national institutions:

- Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.
- Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.
- Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).
- Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.
- Uruguay: Ministerio de Transporte y Obras Públicas (MTOPE), Dirección Nacional de Hidrografía (DNH).

1.5 Duration: 5 years

1.6 Focal area(s): IW

1.7 GEF grant: \$ 900,000

1.8 Co-financing: \$ 7,706,500

1.9 Total funding: \$ 8,606,500

1.10 Associated financing: None

1.11 Contact person:

Name: Miguel Angel López Arzamendia  
Title: CIC Secretary General and Project Director  
Tel: (54-11) 431 22 506  
Email: [secretaria@icplata.org](mailto:secretaria@icplata.org)

**1.12 Project summary:** The subcomponent **objective** is to harmonize national biodiversity strategies within the La Plata Basin, consolidating the actions of the riparian countries within the context of the United Nations Convention on Biological Diversity. Joint actions of the five riparian countries will be carried out to preserve and manage the biodiversity of the basin, with a focus on fluvial wetlands, coastal ecosystems, and biological corridor, native ichthyic species and exotic species control. The subcomponent **outcome:** informed riparian countries formulate water-related Biodiversity Management in the LPB, focusing primarily on the basin's aquatic fluvial ecosystems. The strategy will consider a) best practices for conservation and sustainable use of fluvial wetlands and aquatic ecosystems of the Paraguay, Paraná, Uruguay, and La Plata Rivers, integrating the findings from the proposed pilot activity; and b) the aquatic and terrestrial habitats of the Itaipú-Pantanal riverine corridors and wetlands. Particular focus will be on identifying best practices for sustainable management of fisheries resources and aquaculture, with due consideration for exotic species control. The **activities** will include a) the defining guidelines for water-related biodiversity management in the LPB, while considering the developing complementarities with existing GEF biodiversity projects in the basin, with the Cultivando Agua Boa priority activity; b) conducting biodiversity conservation-based socio-economic assessment, and identify economic opportunities associated good conservation practices. In the case of the Cultivando Agua Boa, the subcomponent priority activity, public-private partnership program, will be scaled-up and replicated; and c) designing an ecological corridor for biodiversity conservation and water protection in the upper catchments area of the LPB (Pantanal-Iguazú-Yacyretá-Salto Grande). In terms of the latter, the proposed new biological corridor will build on the initiative currently underway to link the protected areas of the upper Pantanal/Upper Paraguay river basin with the upper Paraná river basin, which is being implemented under the leadership of the ITAIPU Binational Commission. This corridor will expand to include the Iguazú Falls National Park in Argentina and the other existing protected areas located to the South-East. The proposed new corridor will link also Yacyretá and Salto Grande dam's reservoirs in the Paraná and Uruguay River basins, and the three major river basins ecosystems: Chaco, Pantanal, Cerrado, Misionero/paranaense and the Atlantic forest.

The strategy will identify best practices and outline common strategic actions at the basin level, to preserve, sustain, and manage the basin's biodiversity aligned with the conventions and legislation of the five riparian countries. The proposed actions will take into account the extensive coastal wetland corridor of the LPB that links the Pantanal with the Delta del Paraná on the La Plata River, integrating the Parana River hydrological system, which is one of the world's most diverse and biologically productive wetland systems. The strategy will include designing the priority activity between Itaipú-Pantanal, integrating a system of protected areas for the protection of aquatic ecosystems and their associated ecotones. Integrating these systems ecological corridors will assist in identifying habitat for piloting activities, and monitoring transboundary contaminant flows into aquatic and terrestrial habitats. The focus is in the Itaipu drainage area, Cultivando Agua Boa. Once the site is identified, the priority activity will be designed to include, *inter alia*, activities for managing solid wastes and recycling programs, youth gardening, engaging the participation of indigenous communities, cultivating medicinal plants, promoting organic farming, and/ or adopting sustainable agricultural and fisheries practices. It is anticipated that this level of effort will lead to the protection of biodiversity and environmental health throughout the basin. The **result** will be a harmonized Basin-wide regional strategy for biodiversity conservation, consistent with the objectives of the UN Convention on Biological Diversity. The principles of the strategy include:

- a) A conservation strategy and sustainable use of the fluvial wetlands and ecosystems of the Paraguay, Paraná, Uruguay, and La Plata Rivers;
- b) A basin-wide LPB biodiversity strategy with focus in the aquatic ecosystems, including a specific proposal for the sustainable management of fisheries resources and aquaculture (considering exotic species control protocols);
- c) A design for an ecological corridor for biodiversity conservation and water protection in the upper catchments area of the LPB, with specific actions to be included in the SAP;
- d) A program of actions identifying sustainable economic opportunities within the context of biodiversity conservation; in the case of the Cultivando Agua Boa priority project, a replicable public-private partnership program, based upon the ongoing results, will be identified and established.

**Summary Table of Subcomponent Work Elements, Outputs, and Outcomes**

Work Elements	Output	Outcome
II.4.1. Riverine wetland corridor	North-south wetland corridor management strategy	The north-south wetland-corridor biodiversity conservation strategy and management plan is prepared on the basis of the Itaipu priority activity
II.4.2. <i>Cultivando Agua Boa</i>	Priority Activity: "Cultivando Agua Boa (CAB)" in the Itaipu dam's reservoir sub-basin	The priority activity in the upper Itaipu area engages local stakeholder to implement measures to reduce water pollution and to protect the dam's reservoir from eutrophication
II.4.3. Biodiversity management strategy	Sustainable biodiversity management strategy for the LPB	An ecological corridor in the upper Paraguay, Parana and Uruguay sub-basins is defined and agreed upon by competent institutions coordinated by the CIC

**Summary Table of Subcomponent Work Elements, Funding Sources and Costs**

Work Elements	Sources of funding				Total Cost (US\$)
	GEF Funding (US\$)		Co-financing (US\$)		
II.4.1. Riverine wetland corridor	\$60,000		100,000		160,000
II.4.2. <i>Cultivando Agua Boa</i>	\$750,000		7,500,000		8,250,000
II.4.3. Biodiversity management strategy	\$90,000		106,500		196,500
<b>TOTAL</b>	<b>\$900,000</b>	<b>10%</b>	<b>\$7,706,500</b>	<b>90%</b>	<b>\$8,606,500</b>

## **Part 2: Project design**

### 2.1 Background and context:

**Background and introduction** In taking a snapshot of the state of biodiversity conservation in the LPB, it is important to take into consideration anthropogenic impacts through time, and look to future trends and growing pressures on socioeconomic development within the basin. For example, the main causes of deforestation continue to be largely influenced by economic factors, building upon centuries of converting forests into agricultural areas or fields for livestock, hunting species of commercial value, or planting homogeneous forests. The gradual destruction of areas of Atlantic Forests, a large part of the La Plata Basin, is the result of economic pressures that can be traced to the expansion of new agricultural frontiers. This expansion occurs in areas, such as biodiversity corridors and headwaters woodlands, which are supposed to be protected by legislation. Though economically motivated, this type of exploitation focuses on immediate benefits in ways that are not sustainable, and as such, the growing demand for land for plantations, pastures, urbanization, and other activities is contributing to further environmental degradation. A document from the Ministry of the Environment of Brazil - Assessment and Actions for the Conservation of Biodiversity of the Atlantic Forest and Sulinos Fields – concluded that the vast majority of these forests of the Coast Basin have been deforested, and recent maps of the remaining forests of the LPB reveal a highly fragmented ecosystem. Forest clearings create drastic gaps in the middle of a continuous forest, and create margins or abrupt edges. After deforestation, physical and biological changes occur in the forest,, significantly disrupting the natural ecosystem process, with increased light penetration, wind turbulence, change in temperature and humidity, and other impacts, provoking new responses in vegetation and animal behavior, with changes the structure and biotic composition of the forest. Small forest fragments at the

margins are not, in principle, capable of ensuring the long-term conservation of biodiversity, and generally present less biological diversity than larger fragments characterized by a high degree of connectivity. Even protected areas, such as parks and ecological reserves cannot remain isolated and require a balanced ecosystem. Similarly, other biomes, like the Gran Chaco and the Cerrado ecosystems, are being rapidly altered. The GEF Bermejo River Project documents deforestation of native vegetation and uncontrolled agriculture in deforested areas. The Chaco ecosystems have also undergone changes in the face of the expansion of human activities, as have the Cerrado and Pantanal, which also have experienced drastic conversion of native vegetation for grazing and agriculture. Thus, ecological corridors linking protected areas and forest fragments are tools of conservation that have been widely used in the management of environments such as the La Plata Basin. By implementing this strategy, benefits would include sound scientific practice as well as recognition for effective biodiversity management.

Statement of Issues. A critical and emerging issue in the basin is water related biodiversity management, stemming from both increased pressures on natural resources and the effects of climate change. A diagnostic is required in order to better assess the causes and effects of transboundary environmental issues (as they affect water dependent ecosystems), and to design appropriate strategies to address them. During the PDF-process, the baseline TDA identified some critical and emerging issues associated with biodiversity conservation. In particular, the baseline TDA identified key risks facing the countries and communities of the La Plata Basin. Amongst the present, critical and emerging issues are:

- a) *Extreme hydrologic events linked to climate variability and change*, particularly in terms of the more frequent, longer, and intense floods and extensive droughts, which periodically affect some Basin communities as a consequence of the El Niño/La Niña periodicities, with devastating social, economic, and environmental effects.
- b) *Water quality degradation*, due to organic and chemical contaminants generated by mining and industrial activities without adequate treatment, and sewage water discharges and diffuse contamination mainly from agriculture activities with intensive agrochemical use, has the potential to reduce the utility of the waters of the La Plata Basin.
- c) *Sedimentation* affects navigable waterways and harbors, dams and reservoirs, degrades water quality, and leads to high maintenance costs. Sedimentation, arising from increases in human-induced erosion and from human-induced land degradation due to land use changes and deforestation, threatens not only the human use of the waters of the LPB but also the functionality of the Basin's many ecosystems.
- d) *Biodiversity alteration*, in particular in fluvial and coastal ecosystems including wetlands, resulting from habitat loss and fragmentation. In part, these alterations reflect human interferences in the hydrographic basin as well as longer-term and larger-scale climatic variations that affect the Basin.
- e) *Unsustainable management of fishery resources*, due to overexploitation or lack of capture protection measures to limit incidental catches of non-target species, has important ecological and economic consequences for the River and for the indigenous settlements and poorer (disadvantaged) population sectors dependent upon it for subsistence and livelihoods.
- f) *Unsafe water and environmental sanitation conditions* have effects on human and ecosystem health, produced because of contamination and deterioration of water quality.

2.2 Subcomponent objective: To harmonize national biodiversity strategies within the LPB and define a basin-wide strategy, consolidating the actions of the Basin countries under the United Nations Convention on Biological Diversity.

2.3 Environmental benefits: Biodiversity degradation has been shown to restrict the availability of water for environmental and economic purposes, and to cause, *inter alia*, increased ecosystem changes and public health concerns. Taking a basin-wide approach in preparing the biodiversity conservation action plan will require assessing and monitoring the transboundary issues of biodiversity conservation at the both the sub-basin and basin-wide level, to yield global benefits. In particular, the protection and conservation the Pantanal wetlands, the world's largest wetlands corridor, is critical for the conservation of the richness of aquatic species and the fluvial ecosystems and the lands to which they are tied. Proactive protection and conservation will help prevent fragmentation in this transboundary corridor. The implementation of the priority activity in the Itaipu drainage area, Cultivando Agua Boa, will focus on developing tools and techniques for



managing and mitigating impacts directly associated with eutrophication in the sub-basin, which contains the largest dam in the basin at large. The solutions are tied to management and with due cooperation the issues can be properly addressed. In this sense, the potential for replicability is very high, especially in light of the fact the La Plata River belongs to UNESCO's basin protection management network. Moreover, the project designs a biodiversity management strategy for aquatic and terrestrial ecosystems, and considers the basin as a whole, thereby generating both a regional transboundary and global environmental benefit.

2.4 Overall subcomponent Outcomes: Informed riparian countries formulate a water-related biodiversity basin strategy

2.5. Consistency of the sub-project with national/basin-wide priorities and plans: The defined biodiversity strategies within the LPB will consolidate national actions of the countries under the framework established by the United Nations Convention on Biodiversity.

2.6. Consistency of the sub-project with the GEF strategies and its strategic program: This subcomponent recognizes the importance of biodiversity and is in line, as noted above, with the UN Convention on Biological Diversity, and conforms to GEF4 strategic focal areas.

2.7 Coordination and linkages to the umbrella project activities and other related activities in the basin: The activities within the subcomponent are directly linked to IWRM as they involve the protection of ecosystem corridors, which are transboundary by nature, and critical to the water-cycle ecosystem balance in the basin. This subcomponent ensures linkages to the umbrella Component II. Moreover, the coordination of this subcomponent will be under the supervision of the International Coordinator and linked directly to the development of the TDA and SAP.

#### 2.8 Incremental reasoning:

Baseline Water related biodiversity management is an important issue in the basin due to the increasing pressure on natural resources and the effects of climate change in the basin. Biodiversity alteration, in particular in fluvial and coastal ecosystems including wetlands, results in habitat loss and fragmentation. As it concerns the hydrographic basin in context of the longer-term and larger-scale climatic variations, these alterations are, in part, attributed to human interference. The unsustainable management of fishery resources, due to overexploitation or lack of capture protection measures to limit incidental catches of non-target species, is also a reality, and has important ecological and economic consequences for the river and for the indigenous settlements and poorer (disadvantaged) population sectors dependent upon it for subsistence and livelihoods.

Increment The project contributes to a higher objective set forth by the five signatory countries to the LPB Treaty--Argentina, Bolivia, Brazil, Paraguay, and Uruguay--as coordination of actions and investment in the LPB for water related biodiversity management.

The increment will be: assembling, analyzing, and synthesizing the country-level information into an agreed basin-wide level using a common framework.

The global benefit of this project is an improvement in water related biodiversity management, which in itself implies an improvement in the quality of life for the inhabitants and the protection of rich biodiversity, which exists in this important world reserve. Incremental reasoning for the participation of the GEF in this Subcomponent can be traced to the commitment of the five countries of the LPB to work together in coordinated tasks, controlling common parameters and employing the same protocols, increasing the database and providing free access to all the countries of the Basin. A basin-wide approach with an action plan for water related biodiversity management at the basin level has been shown to be much more effective approach when compared to similar actions undertaken at the individual or national basin level.

2.8 Working Elements - Activities – Outputs – Outcome:

## Subcomponent objective and outcomes

Work Element Objective and Outcomes	Description of output indicator	Baseline level	Mid-term target	End-of-project target
II.4 objective: Harmonize national biodiversity strategies within the La Plata Basin, consolidating the actions of the riparians within the context of the United Nations Convention on Biodiversity	1. North-south wetland corridor management strategy is prepared covering actions from the Pantanal, in the Upper Paraguay, to the Parana Delta and Uruguay river mouth	-Existing sub-basin biodiversity reports, UN Convention on Biological Diversity.  -GEF Pantanal, Bermejo and Freplata projects proposals.	Common LPB strategy to protect the Paraná-Paraguay rivers' wetland corridor by the end of the first semester of year 2.	- Strategy completed and endorsed by the CIC by the second semester of year 2, to be used for the selection of projects proposed under the Public Participation Fund.  - Incorporating findings from priority activities and pilot demonstration, inclusive of recommendations for the SAP
	2. Farm interventions in 2 sub basins at the Parana III basin.	Intervention methodology developed by ITAIPU Bi-national	53 (75%) farm interventions being implemented	100% of the 70 farms implement good farm practices interventions
	3. Sustainable biodiversity management strategy for the upper catchments of the LPB	Not in existence	50% of strategy drafted in framework format	100% of strategy completed, incorporating findings from priority activities and pilot demonstration, inclusive of recommendations for SAP
II.4.1 The north-south wetland-corridor biodiversity conservation strategy and management plan is prepared on the basis of the Itaipu priority activity	North-south wetland-corridor protection strategy and management plan prepared, from the Pantanal in the upper Paraguay basin, to the Paraná Delta and Uruguay River mouth.	Govs. of Ar, Br and Py began an initiative in 2006 to protect the Paraguay-Parana rivers wetland corridor, which was not developed.  Fundación Proteger, an NGO from the region acts in these themes.	Common strategic to protect the Paraná-Paraguay rivers' wetland corridor.  Aquatic biodiversity inventory and assessment for the TDA and SAP.	Public Participation Fund using the Strategy to: orient the design, and select and approve projects for wetland conservation and aquatic biodiversity protection and sustainable use  The Strategy is used as an input for the LPB TDA and SAP.

Work Element Objective and Outcomes	Description of output indicator	Baseline level	Mid-term target	End-of-project target
II.4.2 The priority activity in the upper Itaipu area engages local stakeholder to implement measure to reduce water pollution	. A priority activity in the upper Itaipu dam area (Paraná III) engages 70 local stakeholders (in 29 municipalities) to implement measure to reduce water pollution and to protect the ecosystem in 2 sub basins at the upper Paraná River basin, on the basis of the Itaipu Cultivando Agua Boa Program.	Farms with pollution impacts upon water bodies identified by Itaipu Binational Commission Program Cultivando Agua Boa.	53 farms involved  2 sub basins included, 1 in Br. and 1 in Py.	70 farms involved  2 sub basins included, 1 in Br. and 1 in Py.
II.4.3 An ecological corridor in the upper Paraguay, Parana and Uruguay sub-basins is defined and agreed upon by competent institutions coordinated by the CIC	-Inventory and assessment of the aquatic ecosystems considering invasive exotic species and fishing activities in the Paraná, Paraguay and Uruguay Rivers.  -Common strategic actions to agree in the establishment of an ecological corridor protecting the sub basins of the 3 large international dam's catchment areas, covering 500.000km <sup>2</sup> , of Ar, Br. Py and Ur), to be included in the SAP,	Govs.of Ar, Br and Py began an initiative in 2006 to protect the Paraguay-Parana rivers wetland corridor, which was not developed.  National Biodiversity interventions	-3 technical group reports working on: monitoring system for controlling exotic species; aquatic biodiversity status, and fishery and its regulation in the 5 countries, including identification and assessments of the transboundary causes  -Aquatic biodiversity inventory and assessment for the TDA and SAP.  -Itaipú, Yaciretá and Salto Grande binational commissions of dams, interested and involved in supporting the ecological and water protective corridor initiative  Sustainable biodiversity interventions for the ecological corridor identified	100% of key stakeholders involved  - Agreements proposals for signature by riparian governments on the regulatory fishery measures agreed with key stakeholders involved.  'Technical proposal documented and strategy defined with Itaipú, Yaciretá and Salto Grande dams commissions to create and support the ecological corridor of the upper LPB covering 500.000km <sup>2</sup> from the upper Paraguay, Paraná and Uruguay rivers basins, including AR, Br. Py and Ur).  Appropriate sustainable biodiversity interventions and basin protection incorporated into the SAP

#### II.4.1. Design of a strategy for the conservation and sustainable use of riverine wetlands and ecosystems of Paraguay, Paraná, Uruguay and La Plata Rivers

**Objective:** Common strategic actions at the basin level for conservation and sustainable use of riverine wetlands and ecosystems, to be included in the SAP. This strategy will serve as the basis for implementing universities', NGO's, CSO's, municipalities' or small private companies' projects to be selected and finance through the Public Participation Fund (PPF).

**Outcome:** The north-south wetland-corridor biodiversity conservation strategy and management plan is prepared

**Output** North-south wetland corridor management strategy

- Activities:**
- Compile and integrate existing basin ecosystem information
  - Design a north-south wetland corridor management strategy

Output and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Output II.4.1</b> North-south wetland corridor management strategy	North-south wetland-corridor protection strategy and management plan prepared, from the Pantanal in the upper Paraguay basin, to the Paraná Delta and Uruguay River mouth.	Existing sub-basin biodiversity reports, Convention on Biological Diversity.  - Inputs from the GEF Pantanal, Bermejo and FREPLATA projects  Govs. of Ar, Br and Py began an initiative in 2006 to protect the Paraguay-Parana rivers wetland corridor, which was not developed.  "Fundación Proteger", an NGO from the region acts in these themes.	Common LPB strategic to protect the Paraná-Paraguay rivers' wetland corridor, by the 1 <sup>st</sup> semester of year 2.	- Strategy completed and endorsed by the CIC by the second semester of year 2, used to select projects proposed under the Public Participation Fund.  Incorporating findings from priority activities and pilot demonstration, inclusive of recommendations for the SAP  Public Participation Fund using the Strategy to: orient the design, and to select and approve projects for wetland conservation and aquatic biodiversity protection and sustainable use
<b>a) Compile and integrate existing basin ecosystem information</b>				
<ul style="list-style-type: none"> <li>All projects and activities within the framework of the Ramsar Convention</li> <li>Define biodiversity pilot demonstration</li> <li>Integrate the experiences from the GEF Bermejo, Pantanal and Freplata projects.</li> </ul>			Document integrates the national strategies of the five countries and the existing results of various projects.	
<b>b) Design a north-south wetland corridor management strategy</b>				
<ul style="list-style-type: none"> <li>Integrate and harmonize national and basin-wide actions within the LPB, related to the conservation and sustainable use of riverine wetlands and ecosystems, based on criteria of UN Convention on Biological Diversity, consolidating a common strategy</li> </ul>			<ul style="list-style-type: none"> <li>-Common strategic actions at the basin level for conservation and sustainable use of riverine wetlands and ecosystem, to be included in the SAP.</li> <li>-The strategy serve as the basis for implementing universities', NGO's, CSO's municipalities' or small private companies' projects, to be selected and finance trough the Public Participation Fund (PPF).</li> <li>-Experience to be evaluated and expanded by the SAP</li> </ul>	

#### II.4.2. Priority project in the Itaipu drainage area, *Cultivando Agua Boa*<sup>1</sup>

*Objective:* Implement corrective measures to address environmental liabilities at the individual farm level in the context of protecting biodiversity, and reducing eutrophication. These activities will establish efficient,

effective and replicable mechanisms to support environmental standards at the individual farm level in the micro-basin area within the catchment of the Itaipu dam, in Brazil and Paraguay.

*Outcome:* The priority activity in the upper Itaipu area engages local stakeholders to implement measures to reduce water pollution.

*Output Priority Activity:* “Cultivando Agua Boa (CAB)” in the Itaipu dam’s reservoir sub-basin

- Activities*
- Plan and design CAB priority activity
  - Identify and plan specific farm intervention
  - Implement specific farm interventions
  - Monitor and evaluate intervention activities

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output II.4.2 Priority Activity: “Cultivando Agua Boa (CAB)” in the Itaipu dam’s reservoir sub-basin	A priority activity in the upper Itaipu dam area (Paraná III) engages 70 local stakeholders (in 29 municipalities) to implement measure to reduce water pollution and to protect the ecosystem in 2 sub basins at the upper Paraná River basin, on the basis of the Itaipu Cultivando Agua Boa Program	Intervention methodology developed by ITAIPU Bi-national	53 (75%) farm interventions being implemented. 2 sub basins included, 1 in Br. and 1 in Py.	100%. A total of 70 farms implement good farm practice interventions for the decontamination of water bodies.  2 sub basins included, 1 in Br. and 1 in Py.
<b>a) Plan and design CAB priority activity and outputs</b>				
<ul style="list-style-type: none"> <li>Establish institutional arrangements;</li> <li>ITAIPU Bi-national will prepare, at the local level, the arrangements to establish and execute the grant-based fund and the mechanism for the associated M&amp;E.</li> <li>This Activity will be implemented by the existing personnel of ITAIPU Bi-national, working together with the Technical Coordinator, and in close consultation with the Project Director;</li> <li>Define the operating rules and manuals, as the planning phase of the priority activity.</li> <li>Design grant-funding mechanism and prepare the specific grant tools operative rules, the basic documentation and other tools and instruments needed. This activity will provide GEF funds for contracts with specialized personnel. These personnel will include a planning economist, lawyer, grant specialist and administrative expert.</li> <li>Final documents, models and agreements needed should be prepared under this activity.</li> </ul>			<p>The final design, formal agreement signed with a local institution to operate the grants of the Grant-based fund in the framework of the “Agua Boa” Program; Grant Program Plan of Operations to promote and to operate the Fund in the First Phase, and the operative rules of the Fund established by the end of the 1<sup>st</sup> semester, year 1.</p> <p>These outputs will be combined with the M&amp;E Activity, to have inputs at the end of the First Phase by the end of the 2<sup>nd</sup> trimester of year 2, to evaluate and to adjust, if needed, the Second Phase planned for year 3. A Second Phase Plan will be designed and executed during year 3.</p>	
<b>b) Identify and plan specific farm intervention</b>				
<ul style="list-style-type: none"> <li>This activity will be carry out totally by the Program “Cultivando Agua Boa” under the methodology developed by ITAIPU Bi-national and its own technical and financial resources and the different institutional agreements which they already have in place.</li> <li>The Activity will create an enabling environment and will identify the specific individuals’ needs in order to prepare the conditions of the use of the grant line. The activity will use the technical resources of ITAIPU in order to design a specific plan of farm interventions needed to resolve the existing environmental</li> </ul>			<p>Identification of 70 farmers in 2 environmentally critical sub-basins in Brazil and Paraguay interested, promoted and educated, with specific plans of investments prepared for each property, and four basins plans produced in two different phases of activity execution, during 30 months of activities.</p>	

<p>problems.</p> <p>In so doing, it will conduct specific analysis of the productive conditions and the technically needed interventions, including the cost, with a final design of the grant needed for each producer interested. The farm plans will be structured within the sub-basin plan of action in two phases (two plans), taking into consideration the land planning process under work in the "Cultivando Agua Boa" Program. The total budget for this Activity, from the ITAIPÚ</p>	
<b>c) Implement specific farm interventions</b>	
<ul style="list-style-type: none"> <li>• This will be an activity supported by GEF and ITAIPÚ Bi-national. The priority activity will be to cover, through grant, the 70 farms identified, based in the farm's investment plans and the sub-basins plans for the two contaminated sub-basins of the Parana III basin (one in Brazil and one in Paraguay). The proposal is to have an average of US\$ 5.000 per grant, paid with GEF financial support.</li> <li>• The main interventions which the grants will promote and support include the following:             <ol style="list-style-type: none"> <li>a) To equip farm infrastructure for productive activities and the secure disposal of waists</li> <li>b) Animal management practices and recycling capacity building.</li> <li>c) Building reforms to avoid contamination.</li> <li>d) Promotion of good practices in soil and water management in the farms.</li> <li>e) Protection and recuperation of farms springs.</li> <li>f) Protection and recuperation of riverside forests and aquifer recharge areas.</li> <li>g) Recuperation of legally protected lands.</li> </ol> </li> </ul>	70 grants approved and in the field under agreement with the owners and the same number of farms assisted with plans and investment grants executed to protect and recuperate the contaminated water bodies, by the 3 <sup>rd</sup> year.
<b>d) Monitor and evaluate intervention activities</b>	
<ul style="list-style-type: none"> <li>• ITAIPU Bi-national, as the executive body of the Public-private partnership will develop an M &amp; E Plan, based in criteria and indicators at the reservoir, at a micro-basin level, at the farm and properties. It will also monitor the use of the grant-based fund.</li> </ul>	A final evaluation will be prepared for upgrading the activity during the SAP preparation.

#### II.4.3. Design of a sustainable biodiversity management strategy for the LPB.

**Objective:** Common strategic actions at the basin level to be included in the SAP, to preserve and sustainably manage biodiversity according to the rules of the five countries, implemented pursuant to their national strategies, and developed in terms of the Biodiversity Convention and experiences in the basin.

**Outcome:** Harmonized national biodiversity strategies with focus on water ecosystems within the La Plata Basin, consolidating the actions of the Basin countries under the United Nations Convention on Biodiversity

**Output :** Sustainable biodiversity management strategy

- a) Prepare sustainable management framework for biodiversity / fisheries / aquaculture resources
- b) Design of an ecological corridor for biodiversity conservation and water protection in the upper catchments of the LPB

Work Element Objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Output II.4.3</b> Sustainable biodiversity management strategy for the upper catchments of the LPB	-Inventory and assessment of the aquatic ecosystems considering invasive exotic species and fishing activities in the Paraná, Paraguay and Uruguay Rivers.  LPB sustainable management	0% of key stakeholders involved  National biodiversity interventions	75% of the inventory of the aquatic ecosystem's species. Draft of the Code of Discipline to support the common strategy.	100% of the management strategy completed, incorporating findings from priority activities and pilot demonstration, inclusive of

	<p>framework for biodiversity / fisheries / aquaculture resources, based in a Code of Discipline.</p> <p>- Common strategic actions to agree in the establishment of an ecological corridor protecting the sub basins of the 3 international dam's catchment areas, covering 500.000km<sup>2</sup>, of Ar, Br. Py and Ur), to be included in the SAP</p>		<p>Itaipú, Yaciretá and Salto Grande binational commissions of dams, interested and involved supporting the initiative</p> <p>Sustainable biodiversity interventions for the ecological corridor identified</p>	<p>recommendations for SAP.</p> <p>Ecological/water protective corridor for the upper LPB identified and proposal for its establishment agreed at the CIC for inclusion in the SAP. 3 major dam binational commissions formally involved.</p>
<b>Activities</b>		<b>Outputs</b>		
<b>1 Sustainable management of fisheries resources and aquaculture (considering exotic species control protocols)</b>				
<p>Conservation:</p> <ul style="list-style-type: none"> <li>- Establishment of a code of ethics for responsible fisheries, agreed to between the five countries</li> <li>- Preparation and implementation of an information system for fishing agreements between the five countries</li> <li>- Identification and zoning of areas for potential aquaculture agreed to by the five countries.</li> </ul> <p>Control:</p> <ul style="list-style-type: none"> <li>- Establishment of a system to monitor and control invasive species.</li> <li>- Creation of an information system of information on the golden mussel</li> <li>- Development of an experimental method of physical-chemical-biological control</li> </ul> <p>- Integration of the experiences of the Biodiversity Pilot Project and the regional strategy</p> <p>- Integrating the experiences of the GEF Bermejo, Pantanal and Freplata Projects</p>		<ul style="list-style-type: none"> <li>- Common Code of discipline among the countries for the enforcement of the fishing season, enforcement the reproductive season, the capacity to support fisheries and other key elements of sustainable fishing, by the end of year 2</li> <li>- Identification of the agency responsible by country, during the 1st trimester</li> <li>- Definition of a common methodology for collecting data, during the 1st trimester</li> <li>- Establishment of technical criteria for the identification and zoning, considering the security of the system by the end of year 1.</li> </ul>		
<b>-2 Design of a an ecological corridor for biodiversity conservation and water protection in the upper catchments area of the LPB Regional strategy for water related biodiversity management, based in an ecological corridor</b>				
<ul style="list-style-type: none"> <li>- Design of a system of protected areas for the protection of aquatic ecosystems and their associated ecotones, integrating ecological corridors with monitoring and control of transboundary contaminant flows to aquatic and terrestrial</li> <li>- Design of a harmonized strategy to implement with the SAP an ecological corridor for biodiversity conservation and water protection in the upper catchments area of the LPB This sub-regional strategy will be consistent with the objectives and requirements of the Biodiversity Convention</li> </ul>		<p>Ecological corridor proposal to be included in the SAP and presented to GEF prepared by the end of year 3. Actions in a planning phase to define the specific area of interest supported by the binational commissions of the dams (Itaipu, Yaciretá and Salto Grande) by the end of year 1.,</p> <p>A proposal for a biological corridor prepared and included in the SAP, by the end of year 3. This proposal will link the protected areas of the upper Pantanal/Upper Paraguay river basin with the upper Paraná river basin (actually been implemented under the leadership of the ITAIPU Binational Commission) to include the Iguazú Falls National Park in Argentina and other existing protected areas located to the South-East linking also Yacyretá and Salto Grande dam's reservoirs in the Paraná and Uruguay river basins, and the three major river basins ecosystems: Chaco, Pantanal, Cerrado, Misionero/paranaense and the Atlantic</p>		

	forest
Integration of Actions in the regional strategy project to be included in the SAP and presented to the GEF Major threats and barriers identified to follow and strength the initiative underway to develop a biological corridor to protect the upper catchments areas of the LPB. Preparation of legal and institutional arrangements with a broader stakeholders involvement to support the implementation of the corridor and to include concrete strategic actions in the SAP	Legal and institutional arrangements agreed between key stakeholders to protect the upper LPB catchments areas regional strategy project concerning water related biodiversity management to be integrated into the SAP, including a proposal for a mechanism of financing the implementation of biological the corridor (GEF proposal).

## 2.9 Budget:

### Co-financing

Sources of Co-financing	Type of Co-financing	Amount
Government Contribution	In-Kind	\$100.000
<b>ITAIPU BINATIONAL</b> "Programma Cultivando Agua Boa" (II.4 Integrated Water Resources Management-Water Related Biodiversity)	In-cash	\$7.500.000
<b>ITAIPU BINATIONAL</b> (II.4.3 ; II.2.; I.1.3 and II.7.2)	In-cash	\$106.500

### GEF Budget

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200 Consultants	30,000	10,000	10,000	0	0	50,000
2200 Subcontracts with institutions	265,000	265,000	200,000	25,000	25,000	780,000
3200 Workshops and training	25,000	15,000	15,000	15,000	0	70,000
<b>Total</b>	<b>320,000</b>	<b>290,000</b>	<b>225,000</b>	<b>40,000</b>	<b>25,000</b>	<b>900,000</b>

### Consultants to be hired for the project

Consultant Position Titles	\$/person week	Estimated person weeks	Tasks to be performed
Local Technical Assistance			
Biodiversity: Consultant 1	750	27	Definition of a basin-wide strategy for the conservation and sustainable use of wetlands
Biodiversity: Consultant 2	750	40	Definition of the aquatic biodiversity strategy principally focused upon fish resources and the control of non-indigenous species. Sustainable management of fisheries resources and aquaculture (considering exotic species control protocols)

### Sub contracts with institutions to be hired for the project

Sub contracts	Tasks to be performed	Amount
Subcontract 1	Grant-based fund established to provide investments for interventions aimed at the reduction of the environmental liabilities of properties in hydrographic micro-basins. Grant funds for	\$750.000



Sub contracts	Tasks to be performed	Amount
	financing ensure the sustainability and replicability of the pilot project.	
Subcontract 2	Design of a basin-wide strategy for water related biodiversity management, based in an ecological corridor. Ecological corridor proposal to be presented to GEF. Design of a system of protected areas for the protection of aquatic ecosystems and their associated ecotones, integrating ecological corridors with monitoring and control of transboundary contaminant flows to aquatic and terrestrial.	\$30.000

### 2.10 Timetable:

Working Element	Activities	Schedule of Activities																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
II.4.1. Design of a strategy for the conservation and sustainable use of riverine wetlands and ecosystems																					
1 Integration of information from projects existing in the basin																					
2 Design of the strategy																					
II.4.2. Priority project in the Itaipu drainage area, <i>Cultivando Agua Boa</i>																					
1 Planning the Priority Project																					
Planning																					
Workshop																					
2 Collective Works																					
Specific plan of farm interventions																					
3 Interventions at the farm scale																					
Farms conditions																					
Farms investment																					
3 Monitoring and Evaluation Plan																					
Monitoring																					
Evaluations																					
II.4.3 Design of a harmonized basin-wide strategy for water related biodiversity management																					
1 Sustainable management of fisheries resources and aquaculture (considering exotic species control protocols)																					
2 Design of a basin-wide strategy for water related biodiversity management , based in an ecological corridor																					

2.11 Cost effectiveness: The conservation of the world's largest wetlands corridor is critical for the conservation of aquatic and fluvial riches and associated terrestrial ecosystems. The conservation provides direct cost effectiveness at a technical and economic level, specifically by integrating the basin through development integrated analysis and interdisciplinary groups.. The collaborative analysis in the five countries allows for positive steps towards reducing basin-wide asymmetries and levelling skills, with lower costs and additional benefits for future development offered by integration. Cost effectiveness at the technical and economic levels can be maximized by developing focused pilot interventions in multi-national areas, which can be replicated at the basin level in conformity with basin-wide guidelines and agreement. The priority project managing contaminated micro-basins contributing to the Itaipu dam, which is the largest in the basin,

is such an example. The potential for replicability is very high when it comes to a river that belongs to the network of UNESCO basins under protection-management. The management strategy agreed upon for the basin level will address the management of aquatic and terrestrial ecosystems with the benefit of assistance at the basin level, thus integrating the transboundary problems. Additionally, technical and economic benefits will be maximized due to the synergy achieved through joint action at the local and basin level, particularly with regard to the GEF projects in the region.

## 2.12 Risk Analysis

Risk	Rating (L/M/H)	Risk Mitigation Measures
The project do not integrate the existing projects in the basin	M	The key institutions acting in this field are involved in the project
Geographic extent of the Basin, which is a limitation to effective and efficient participation and the active involvement	L	Strong linkages with civil society, professional bodies, and relevant governmental bodies will minimize this risk

**2.13 Sustainability:** Project activities and implementation are designed (including the public involvement and stakeholder participation processes) to achieve sustainability. All of the activities form the foundation of multi-sector, multi-institutional, and basin-wide arrangements for the implementation of the monitoring system. The project will be carried out by relevant government agencies, and will strengthen the existing institutional and human capacities. The networks will be integrated at an agreed upon basin-wide level using a common framework, which maintains national responsibility for executing the action plan established for this stage.

**2.14 Replicability:** The project results will be disseminated through the CIC public outreach program, to government institutions, non-governmental organizations, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including the institutions related thereto in each of the five countries, will permit the development of information transfer mechanisms to share new knowledge and provide for active coordination and horizontal cooperation in the integrated management of the water resources of the Basin.

The “Agua Boa” project deals with a common upstream basin problem and the insight obtained will be easily adopted at the basin-wide level throughout the disseminated process. Since all of the proposed activities are multifaceted in nature and include a strong multi-stakeholder participation element that will contribute to the “buy-in” of the project constituencies, the prospect for replicating such activities are high and can be achieved with minimal efforts exchanging relevant information and experience learned.

**2.15 Execution arrangement:** National Project Units, the Itaipu, Yacireta and Salto Grande binational organizations, National Environmental Secretariats, National Fishery Institutions, and civil society organizations involved through the Public Participation Fund.

**2.16 Public participation mechanisms:** The direct engagement of the farming communities, engagement of the basin communities in the vicinities of the ecosystem corridors strengthens basin governance, and is present in each of the activities to be executed during the project. Promoting public participation in this project is integral and transversal to the process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society—with special focus on gender equity and indigenous peoples. This involvement also will favor appropriations and the social sustainability of the action plan during both its formulation and implementation, consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

**2.17 M&E:** The project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed Monitoring and Evaluation Plan (Component I), based upon the Results Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring

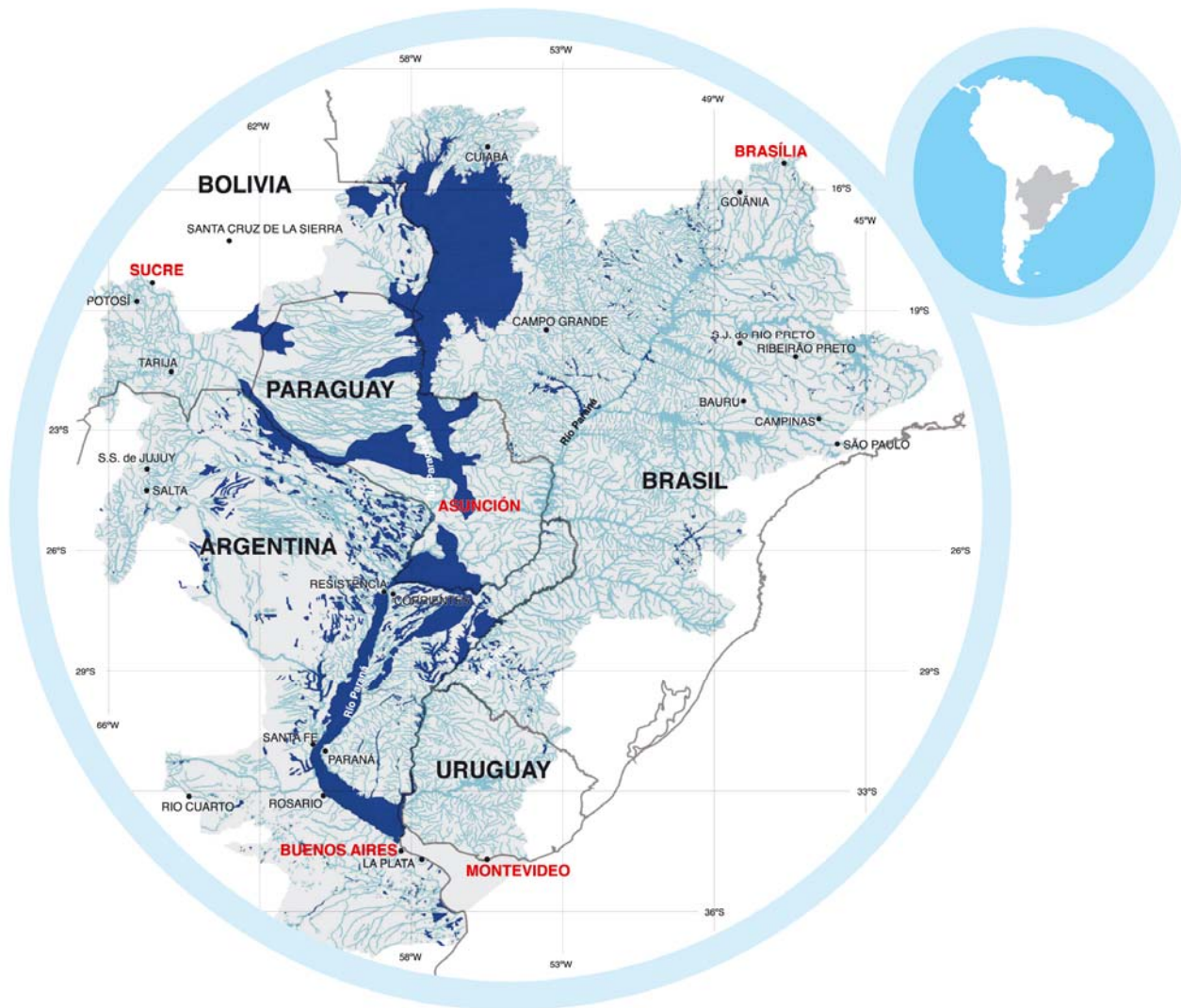
feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

### Process Outcomes and Indicators

Process OUTCOMES	Process INDICATORS
Multi-country agreement on transboundary priority concerns, impact and cause	<ul style="list-style-type: none"> <li>• Harmonized basin-wide strategy for biodiversity conservation (with particular attention to wetlands corridors) of the La Plata River Basin countries within the UN Biodiversity Convention and other international treaties and agreements by the end of the project</li> <li>• Environmental Management Designed Plan for a Ecological Corridor developed by the end of the project</li> <li>• Preparation of a Monitoring System for controlling the introduction of exotic ichthyo fauna by the end of the project</li> <li>• Harmonized regulatory fishery measures amongst the riparian countries by the end of the project</li> </ul>
Multi-country agreement on governance reforms and investment to address priority transboundary concern	<ul style="list-style-type: none"> <li>• Constitution of the Technical Group of the CIC relating to Biodiversity as and advisory committee for the execution of the Subcomponent 2 months after the beginning of the Project</li> <li>• Reports and minutes of meetings of the Technical Counterpart of the CIC concerning biodiversity.</li> </ul>
Effective national Inter-ministry Coordination	<ul style="list-style-type: none"> <li>• Inter-ministerial mechanism established at the national level to agree to the execution of the Biodiversity Subcomponent (national group).</li> <li>• Inter-ministerial agreement of the agencies involved in each country to define the representation of the Technical Counterpart of the CIC concerning biodiversity.</li> <li>• Reports and minutes of meetings of the national groups</li> </ul>
Stakeholder involvement	<ul style="list-style-type: none"> <li>• Increase awareness of and participation in biodiversity project activities through workshops and meetings with local authorities, institutions, and stakeholders.</li> <li>• Preparation and wide dissemination of project-related documentation and project-related activities through the Fund for civil society.</li> </ul>
Transboundary waters legal framework adopted and/or strengthened	<ul style="list-style-type: none"> <li>• Guidelines for an harmonized legal framework in agreement with the CIC</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions	<ul style="list-style-type: none"> <li>• Cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>• Institutional strengthening (training and equipment) provided to institutions related to the biodiversity.</li> </ul>

**Annexes**

**Annex 1: Map of LPBWetland**



## Annex 2: Terms of Reference for Consultants

### Consultant 1

**Objective:**

Definition of a basin-wide strategy for the conservation and sustainable use of wetlands

**Activities:**

The Consultant will prepare the agenda for a meeting of experts from the countries managing the wetlands of the LPB. Ultimately, this should result in the acquisition of relevant information concerning the topic. Based on this documentation, an evaluation will be done and a common strategy will be created for these countries to follow.

**Results:**

A technical document with the strategy to follow concerning the management of the wetlands will be prepared.

**Duration**

The duration of this task will be 12 months.

### Consultant 2

**Objective:**

Definition of the aquatic biodiversity strategy principally focused upon fish resources and the control of non-indigenous species. Design of a project for the corridor between Itaipu and Pantanal

**Activities:**

The consultant will prepare the agenda for a meeting of experts from the countries that manage the aquatic biodiversity focusing mostly on the management of the fishing resources and the control of exotic species. This will result the consultant will gain relevant information regarding this topic. Drawing upon this information, an evaluation will be carried out and a proposal will be created for a common strategy for the countries to follow.

This strategy will be reviewed by the countries, and, based upon their comments; a strategy will be defined concerning the management of fishing resources and the control of exotic species in this part of the countries. The Itaipu and Pantanal corridors should be included in the design.

**Results:**

A technical document shall be prepared with a strategy to follow in the management of fishing resources and in the control of exotic species. This will be related to the biodiversity project involving the corridor between Itaipu and Pantanal.

**Duration**

The duration of this task will be 36 months.

### Annex 3 Additional Information of “Cultivando Agua Boa”

PROJECT TITLE: *Public-private partnership “CULTIVANDO AGUA BOA” REVOLVING FUND (BRAZIL AND PARAGUAY)*

EXECUTING AGENCIES: *ITAIPU BI-NATIONAL IN agreement with the CIC*

DURATION: *36 Months*

#### PROJECT SUMMARY

##### Background

During the execution of the PDF Block B to prepare the Framework Strategic Action Program (FSAP) for the La Plata basin, the Baseline TDA (MTDA) detected, as an increasingly important problem, the contamination of water bodies. The main causes identified were soil erosion and sediment transportation, urban growth without adequate sewage treatment, solid waste dispersion, massive deforestation of protective forests and the bad use of agrochemicals, problems particularly increased in the reservoirs due to the water slowness created by the construction of dams. To strengthen the basin-wide capacity to protect water quality the 5 countries involved in the FSAP preparation agreed to develop a key Activity for “*Water Quality and Contamination Evaluation and Monitoring*” under Component II, with the inclusion of the main actors and key stakeholders of the La Plata Basin. This priority Project was identified as a Priority one, based in the interest of ITAIPÚ Bi-national and the environmental problems the institution is addressing in the upper Paraná River, coinciding with the FSAP main objective.

ITAIPÚ bi-national hydroelectric power plant is a joint development of Brazil and Paraguay carried out by ITAIPÚ Bi-national, an entity created and owned in equal proportions by both countries to build and operate the hydroelectric complex. With an installed capacity of 12,600MW generated by 18 generating units (two more are under construction), it accounts for about 25% of the power production of Brazil and 80% in Paraguay. A reservoir dam of 1,350 km<sup>2</sup> was created. On May 5 of 1984, the first generator unit of Itaipu started his operation. The 18<sup>th</sup> Unit entered the phase of commercial power production on April 9 of 1991.

During the year 2003, with the inclusion of Social and Environmental Responsibility in its mission, ITAIPU Bi-national began to focus on its reservoir, with the incorporation of the pluvial environment, represented by the rivers and its respective hydrographic basins, through a mega program named “Cultivando Água Boa”, that has on its essence the management of his hydrographic basin, using the basin as a planning unit and breaking the geopolitics borders in the basin of influence of the reservoir. Consequently was necessary enlarging the carries with the multiply uses of the water, going over the energy generation, considering mainly:

- the sustainability of the water collecting points for the human consumption;
- the availability of leisure public areas, the beaches;
- the watering channels used by the cattle created by the bordering rural properties;
- the water collecting points for irrigation and agricultural cultures, and;
- the areas of support to the professional fishing activities that are the fishing points, which are used by organizations of about 800 handcraft fishermen.

In the face of evidence of the environmental impacts that limit the multiple uses of the water, it was necessary to consider the impact on the environment made by bordering municipalities, including the co-users of the waters of the basins of influence in the reservoir, coexisting with others interested in the waters, which had grown from a territory of 16 municipalities to a territory consisting of 29 municipalities in the Paraná River Hydrographic Basin, called Paraná III, with the approximately support of 1,247 local and national partnerships (municipalities, NGOs, organizations of the federal and state government, cooperatives, associations, settlements and others), distributed in several committees of sub-basins.

In order to establish sustainable relations, it was necessary to change the status quo through a new enterprise for ethical conduct, founded in the Federal Government directives and in the global documents, as

the Goals of the Millennium, the Earth's Letter, the Agenda 21, the Kyoto's Protocol, and the Treaty of Environmental Education for Sustainable Societies and Social Responsibility.

In the left border of the Paraná River (see attached map), as result of a extensive and intensive efforts in sensitizing and involving authorities, leaderships, institutions and communities of the basin, the First Phase of the project was commenced. It was commenced in common agreement between the actors that would be involved in the process of creating programs and projects such as the "adoption" of a sub-basin in each one of the 29 municipalities of the Paraná River Hydrographic Basin III. Based on the experiences drawn from the First Phase, the actions will be extended to the other sub-basins of the Paraná River Hydrographic Basin III in the Second Phase of the project.



The model of social environment management of Itaipu was established under four conditions:

1. **Environmental Management**, with the adoption of procedures and methodologies based in the Norm NBR ISO 14001, without aim the certification. It is a recognized methodology and internationally consolidated containing quality principles such as the cycle PDCA (Planning, Execution, Verifying and Critics Analysis and Revisions) and others, as methods of bringing about corrective actions for the causes of the meaningful environmental impacts.
2. **Territorial information management**, to investigate, organize, make reference and supply the territorial information, used in several management levels and programs and project teams such as the Coordination Directory of Itaipú, as well as the other co-users of the waters. This management is based in the structuring of a Multi Finality Technical Records, making compatible the data banks, geoprocessing, the informatics' infrastructure, and the resources of the thematic cartography.
3. To address this requirements the Itaipú Binacional and the Technological Park Itaipú (PTI), developed a computerized system named Geographic Information System - SIG@LIVRE, based in the principles and concepts of free software.

4. **Participative Management**, founded in the principles and practices of public politics, that find orient the official institutions in the paper of inciting of programs, plans or projects of inter discipline nature, stimulating partnerships in cooperate in themes of interests, to reach common objectives, making that each participant be able to execute its attributions participating intensity in all the program phases. The organization and operation of this process are made by Management Committees that jointly manage the programs and projects in a participative way, with the support of approximately 1,247 partnerships, distributed in the several committees of sub-basins.
5. **Management by Programs**, optimizing the structure, competencies, and internal talents necessities, of the several organs and hierarchic levels of the Entity. This process is monitored by the Projects Room to make practical the development and accompaniment of the programs and its projects.

Besides the Management by Basin Programs, there are other actuate on a transversal way, complementing the Social and Environmental actions necessities in the Paraná River Hydrographic Basin III. Those are Environmental Education, Production of Fishes in our waters, Biodiversity Our Patrimony, Management of Information and Process, Sanitation of the Region, Education and Basin-wide Sustainability, Monitoring and Environmental Analysis, Valorization of the Institutional Patrimony and Support for the Rural Population.

The actions are in accordance with the following priorities following the methodology of the Itaipú's situational strategic planning, it was adopted the matricidal

- **Collective actions** – They benefit the community as a whole: reconstitution of ciliar bush and installation of fences of isolation and protection, adequacy of roads, soil conservation and water, installation of communitarian supplier, acquisition of organic seed deliverers, ploughs, mechanism of clean development for carbon sequestration (condominium sewer and collective station for treatment of waste, resetting ciliars bushes on the properties, urban garbage – sanitary basin-wide dirt-fill).
- **Individual actions** – They are specific for each property, for execution of the environmental adequacy, identified in the phase of the diagnosis, which results the identification of necessities of correction and improvements, such as pig sties, stables, aviaries, and others.
- **Others** offered to the cities and communities to be implanted in accordance with the reality, interest, and availability of each city, foreseen in the projects such as: Organic Agriculture, Medicinal Plants, Youth Gardening, Solidarity Collection, Aquiculture and Fishing, Alternative Cultures, and others.

#### a) **Executive projects**

Executive projects are carried out through agreement with the universities and faculties of the basin. The students, under orientation of professors of Itaipú's techniques, diagnose properties and the adequacy project, the teams are provided technical detail of what and how these tasks must be accomplished in a way that is legally and ecologically correct as well as economically sustainable;

#### b) **Management Committees**

Management Committees are created for the planning and implementation of the actions in the sub-basins and are integrated through representatives from Itaipú, several municipal, state and federal entities, cooperatives, companies, syndicates, social entities, universities, schools and agriculturists, with the widest participation possible;

#### c) **Sensitizing**

Itaipú's team carries out meetings with authorities, leaderships, ownership of the right and left borders of the sub-basin for this purpose. This provides land owners with the opportunity to adjust their properties and provides supplements for legislation and to the correct environmental practices, in a solidarity and cooperation environment;

#### d) **Workshops**



Workshops have the objective of uniting the community (including men, women, elderly, youth, and children) and informing them of the obligations of the inhabitants of the sub-basins to the environment in which they live. The workshops take place in three phases:

- **Lamentation Wall and Hope Tree** – The community identifies and laments the behaviors that damage the environment, recognize, and make a list of the problems that they need to solve, as well as the aspirations of today and tomorrow (dreams).
- **Way ahead** – The community defines the corrective actions, promises to modify its conduct, and live with greater harmony between humans other creatures.
- **Water Pact** – An opportunity to celebrate the care of the waters, where the communities symbolically sign a Water Pact Letter, a document generated by the Future Workshops where the community unveils its problems, dreams and the steps required to guarantee the sustainability of Agenda 21 in the basin.

#### e) Agreement

The Agreements are formal and legal instruments of participative management, signed between Itaipú and others institutions (governmental, privates, universities, among others), defining the participation and attributions of the signer for implementing the environmental corrective measures and the construction of the sustainability of the sub-basins.

### Health in the frontier

The Environmental Laboratory develops a program where epidemiologists monitor and strengthening of the Public Health System in the Border basins, with the following actions:

- Research bacterium, fungi and environmental protozoa in water and air samples which can cause illness in humans.
- Research and monitor microorganisms in animal reservoirs, in this case, wild animals of the basin.
- Develop laboratory techniques to identify and quantify these microorganisms.
- Provide training in the techniques of health service for researching and monitoring fungus and environmental protozoa capable of causing illness by endangering the immune system.

### The main activities

- *Cryptosporidium* sp. research in environmental sample (water) and biological samples (animal and of human excrements.)
- Identifying of *Acanthamoeba* sp. in water and biofilm samples.
- *Legionella* sp. research in environmental samples.
- Qualifying and quantifying of environmental fungus in water, air and biofilm samples.
- Environmental Laboratory shall carry out approximately 12 thousand analyses per year, to assist in the numerous environmental actions developed by Itaipú. Among these actions, include research on the following topics:
- biological agents associated with the decomposition of materials, structures and equipment of the Hydroelectric Central;
- quality of life of the employees and their work environment (microbiological analyses of water, milk and coffee, air-conditioning, equipment of individual protection, telephones);
- determination of reference values in laboratory examinations and diagnostics of illness of wild animals and fishes;
- research related with the *Limnoperna fortunei* (golden mussel);
- bacteriological monitoring in samples of water from the Paraná River Basin III.

The Environmental Laboratory also participates in research developed with others Institutions, like Fiocruz, Fundacentro, USP, Unioeste, UnB, UFPR, UTFPR, Cetesb and others and has published numerous papers with those institutions.

The results of the analysis of the Fauna Operating Program were published in book format: The book contains reference values for 38 species of wild animals in the basin and has unedited data applicable in wild fauna conservation projects.

Common research with other institutions and the contact between researchers results in the generation and transference of scientific and technologic knowledge.

## **PROJECT OBJECTIVES**

This Priority Project seeks to establish a public-private partnership between ITAIPÚ Bi-national (Brazil and Paraguay) and the CIC for implementing a Revolving Fund to resolve environmental problems in individual actions, specifically for small farms and each property, for execution of its environmental adequacy identified by the “*Cultivando Agua Boa*” Program in the phase of diagnosis.

It will be prepared and implemented under the Framework Strategic Action Program (FSAP) of the La Plata Basin, to strengthen the results of the bi-national Program “*Cultivando Agua Boa*” (Cultivating Good Water) executed by Itaipú Bi-national, in close coordination with local communities and key institutions of Brazil and Paraguay. Doing so, it will complement the bi-national Program to achieve the substantive environmental and social goals proposed. As a new initiative under the ITAIPÚ Program, the Grant-based fund will start from the existing background information and community organization, and will use the methodologies developed by “*Cultivando Agua Boa*” in the last three years of successful practices promoting the integrated water management in the upper Paraná River Basin (named Paraná III).

The Grant-based fund will be established to help small producers located in environmentally critical micro-basins, to eliminate the accumulated organic pollutants which have accumulated as well as to resolve other environmental problems affecting its water quality. The final objective is to recover and protect the water quality in selected micro-basins of ITAIPÚ's reservoir drainage area, affecting the entire upper Paraná basin and particularly the dam's reservoir.

The increasing processes of eutrophication detected in particular water bodies of the dam's reservoir are directly caused by this kind of contaminants, soil erosion and the loss of the water body's protective vegetation. As a goal of this Priority Project, ITAIPÚ Bi-national and the CIC will have an additional key experience of work, using economic incentives to resolve environmental problems. By this way, the financial mechanism will be establish and implemented to help small farmers in the secure disposal of solid waste and sewage accumulated by pork, poultry and “lots” cattle production that are diluted by rains and sweated to the rivers, and to the dam's reservoir, affecting water quality, biodiversity and human health.

The incremental support of the GEF will help ITAIPÚ Bi-national to start and try this particular institutional arrangement as an economic environmental instrument. The activities will be prioritized in agreement with the small farmers from selected contaminated sub-basins that affects ITAIPÚ's reservoir. The Grant-based fund will facilitate grants without interest to the small farmers selected, according to the plan to eliminate safely the waste or to resolve the environmental loss, as protective forests. The operating cost of the grants will be cover by ITAIPÚ Bi-national in base of the “*Agua Boa Program*” acting as a co-grant for this Priority Project.

The project will bring technical assistance and financial help, in accessible way, for small farmers located in the polluted sub-basins selected, acting at the individual property level, but in a framework of the very broad and participative ITAIPÚ Bi-national Program. This framework will act a base to give the farmers an environmental license for their farms.

Another important objective of this Priority Project is to try, consolidate, and validate a methodology to build an efficient and effective mechanism to support the recovery of the private contaminated or eroded properties. This mechanism could be replicated in other sub-basins of the Paraná III basin, in other dam drainage areas of the La Plata basin, and in similar conditions in the entire world.

## PROJECT RATIONALE

Due to its Constituency and the legal agreement signed between the two countries for ITAIPÚ Bi-national (Brazil and Paraguay) operations, its existing financial resources, oriented to protect and manage the dam's reservoir drainage area, can not be directly use in private initiatives. This legal restriction left one of the main causes of water contamination in the upper Paraná Basin without any possibility to address directly the solution to the problem, mainly in the case of the small farmers.

As it was presented in the background information, based in “*Cultivando Agua Boa*” Program, ITAIPÚ will work in all needed features to give the communities, stakeholders and producers, the capacity to be organized and educated and to introduce new production technologies in the Parana III Basin. However, small farmers have not the economical capacity to resolve the safely disposal of the accumulated organic solid waist and to resolve other under Component II environmental existing problems generated in the past, as deforestation and soil erosion. Years of intensive production of poultry, pork, milk, and “lot” cattle production, and the strength deforestation and agricultural use, generated them. Research done by ITAIPÚ Bi-national shows that the accumulated waist swiped to the water bodies, the soil erosion and it transport to these waters, are the main cause of water contamination and eutrophication, already identified in some areas of the dam reservoir.

The project will financially support the small farmers, giving them an economic incentive in order to assure a safely waist disposal, the recuperation of degraded lands and the protection of the water bodies. ITAIPU will help in the payment of some key investments needed at the community level, and will bring technical assistance to the farmers and local organizations, using its technical personnel, which is already cooperating with the farmers in different activities.

The methodology to be used will follow the one used to promote and organize the local communities by “*Cultivando Agua Boa*” Program, then, the Priority Project will be part of a complete package of measures under the responsibility of ITAIPÚ, with a marginal cost and huge final environmental and social benefits.

Additionally, ITAIPÚ Bi-national signed an agreement with UNESCO HIP to work in one of these most contaminated micro-basins, the Sao Francisco Verdadeiro River, as a demonstrative project for the HELP Program. Based in this agreement, both institutions agree to create the digital Latin American Center for Hydro Information, which will support with data and expertise the preparation and development of this Priority Project. In addition, the Latin American Center will support the monitoring and evaluation process to assure the results of this Priority Project and will act as a center for dissemination of the experience gained and lessons learned. The inclusion of this Center will be a key factor for the future replication of the experience, being HELP a UNESCO Hemispheric and Global Program, working in a close network, and sharing expertise and experiences in integrated water resources management.

## ACTIVITIES AND FINANCIAL INPUTS NEEDED TO ENABLE CHANGES

*Operational Mechanism.* The execution of the Grant-based fund will be in base of two kinds of tasks:

- A collective one, that will be cover by ITAIPÚ Bi-national under the Agua Boa Program, as co-through grants supportd activities to this Priority Project and,
- the second one, which will be object of the GEF financial support.

The project must be understood as a combined activity of collective and individual tasks.

The collective tasks prepare the communities and inform them about the Grant-based fund, promoting it, and including his activities and outcomes in the local plan of actions in the selected sub-basins. These collative works will constitute the enabling activities needed for the successful operation of the Grant-based fund.

The individual tasks will work under the methodology used by ITAIPÚ Bi-national taking into consideration the ownership of the land and the particular characteristics of the property. The objective will be to identify and resolve the environmental problems at each farm level, identifying the use of contaminants in agriculture, the accumulated organic waist existing in the farms, the status of the protective forest and vegetation, looking simultaneously about the farmer responsibility and his economical capacity, including his interest in the use of the Grant-based fund.

For the operation, a line of grant will be prepared and established, in agreement with a local administrative institution that will be selected by ITAIPÚ, in close consultation with the FSAP Director (SG of the CIC), and the International Technical Coordinator. The financial operating the grant line will act under ITAIPÚ supervision and under a signed agreement.

The lines of grant will be organized in phases, under four basic Activities, in which is organized this Priority Project. As a Grant-based fund, each beneficiary of the grant will return it, in a logical period, for the total recuperation of the amount of money borrowed. The proposal is to have a subsidy for the grants do to the environmental benefit of the interventions to be covered by the grant, but assuring the recuperation of the 100% of the amount of the Fund for its continuity. The feasibility will be defined during the preparation under the Activity 1.

### **Activity 1. Planning the Priority Project.**

This activity will cover the institutional arrangements; the design of the lines of grant; and will define the operating rules and manuals, as the planning phase of the Priority Project. ITAIPU Bi-national will prepare, at local level, the arrangements to establish and execute the Grant-based fund and the mechanism for its M&E. This Activity will be done by the existing personnel of ITAIPÚ Bi-national, working together with the Technical Coordinator of the FSAP, and in close consultation with the Director of the FSAP. To prepare the specific tools needed as the lines of grant, operative rules, the basic documentation and other tools and instruments needed. The Project will provide GEF funds for contract with specialized personnel. These personnel will include a grant planning economist, lawyer, grant specialist and administrative expert. Final documents, models and agreements needed should be prepared under this activity. The Activity will be executed during the first 6 months of the project.

**Output.** The final design, formal agreement signed with a local institution to operate the grants of the Grant-based fund in the framework of the “Agua Boa” Program; lines of grant defined a Plan of Operations to promote and to operate the Fund in the First Phase, and the operative rules of the Fund established. These outputs will be combined with the M&E Activity, to have inputs at the end of the First Phase to evaluate and to adjust, if needed, the Second Phase planned. A Second Phase Plan will be designed.

### **Activity 2. Collective Works.**

This activity will be carried out entirely by the Program “Cultivando Agua Boa” under the methodology developed by ITAIPÚ Bi-national and its own technical and financial resources and the different institutional agreements they have already in place. The Activity will create the enabling environment and will identify the specific individuals’ needs preparing the conditions for the use of the grant line. Using the technical resources of ITAIPÚ will be design specific plan of farm interventions needed to resolve the existing environmental problems, the specific analysis of the productive conditions and the interventions technically needed, including the cost, with a final design of the grant needed for each producer interested. The farm plans will be structured within the sub-basin plan of action in two phases (two plans), taking into consideration the land planning process under work in the “Cultivando Agua Boa” Program. The total budget for this Activity will come for the ITAIPÚ Co-financing is estimated in US\$ 5,100,000.

**Outputs:** Identification of 70 farmers in 2 environmental critical sub-basins in Brazil and Paraguay interested, promoted and educated, with specific plans of investments prepared for each property, and four basins plans produced in two different phases.

### **Activity 3. Interventions at the farm scale.**

This will be an activity through grants supported by GEF and ITAIPÚ Bi-national. The goal of the Priority Project will be to cover with grants the 70 farms identified, based in the farm’s investment plans and in the sub-basins plans for the two contaminated sub-basins of the Parana III basin (one in Brazil and one in Paraguay). The proposal is to have an average of US\$ 5,000 per grant, paid with GEF financial support. The cost of the Activity 3, to prepare all the basic documentation and assessment pay under the “Cultivando Agua Boa” Program by ITAIPÚ, will be US\$ 1,000,000.

The main interventions to promote and to support with the grants can cover the following areas:

- To adequate the farm infrastructure for productive activities and secure disposal of waists.
- Animal management practices and recycling capacity building.
- Building reforms to avoid contamination.
- Promotion of good practices in soil and water management in the farms.
- Protection and recuperation of farms springs.
- Protection and recuperation of riverside forests and aquifers recharge areas.
- Recuperation of lands legally protected.

**Outputs.** A 70 grants approved and in the field, under agreement with the owners and the same number of farms assisted with plans and investments grants executed, to protect and recuperate the contaminated water bodies.

#### **Activity 4. Monitoring and Evaluation Plan.**

ITAIPU Bi-national, as the executive body of the Public-private partnership will develop an M & E Plan, during the two phases of the Priority Project, based in the following criteria and indicators:

##### *4.1 At the ITAIPÚ reservoir,*

- Sediment rate
- Eutrophication rate
- Algae population and baselinetitas

##### *4.2. In the sub-basin waters discharges*

- Water quality index (modified). Organic contaminants and nutrients, using ITAIPÚ accumulated experience in the parameters to be measure.
- Biologic indicators.

##### *4.3. At the farms and properties*

- *Level of adoption to the proposed criteria for environmental management of the land and animals.*
- *Environmental security of buildings and equipments.*
- *Introduction of protecting environmental measures in agriculture activities.*
- *Environmental security in the productive activities. Level of use of agro-toxics in agriculture. Area under minimum soil leverage.*
- *Number of springs protected.*
- *Area covered with riverside protected forest.*
- *Area of legally protected areas covered by forests or permanent productive vegetation.*

##### *4.4. Related to the Grant-based fund use*

- *Local institution involved in the execution of the Fund.*
- *Number of grants of the Grant-based fund requested and approved.*
- *Number of environmental interventions executed.*
- *Level of the monetary execution of the grants and average of the grants approved and used*

As a result of the evaluation of the First Phase executed at the Second Phase to cover the remaining 60 farms proposed to complete the total goal of 160 farms, will be prepared. Finishing the Second Face a final evaluation will be prepared for the general evaluation of the FSAP.

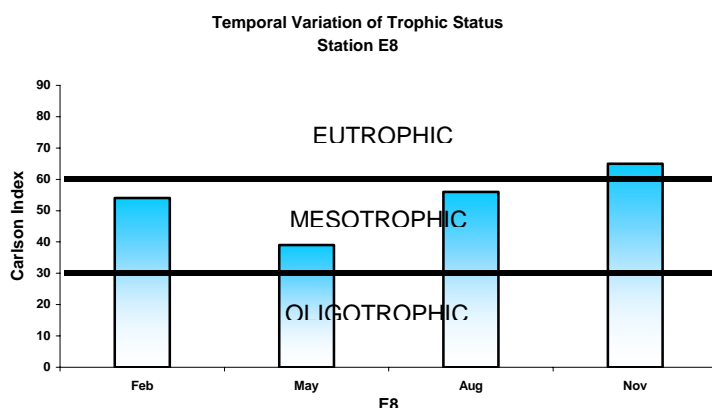
**Outputs.** A first step of an M&E Plan executed, with the information needed to evaluate the First Phase of the Grant-based fund. Recuperation of part of the Grant-based fund. An evaluated experience using an economical mechanism for environmental management. A report and publication to communicate the experience gained and expand the expertise to replicate the Project in other sub-basins of the Paraná III basin, or in other areas of the Plata Basin inside the FSAP. A Mid Term Evaluation, as a base to redefine the Second Phase, and a Final one to be included in the FSAP final evaluation and for replicability proposes.

#### **BASE LINE**

The Grant-based fund will try to resolve the accumulated environmental damages of already degraded sub-basins of the ITAIPÚ dam reservoir drainage area, in Brazil and Paraguay. The ITAIPU Company has already developed a big amount of works to resolve the environmental problems in the Brazilian and the Paraguayan sides, with total investments in the order of the 10 millions of US dollars, after the start of the “*Cultivando Agua Boa*” Program, in 2003. Nevertheless, these investments done under the collective activities, covering 29 sub-basins of the Parana III basin and involving 1200 owners, the needed

interventions in these particular farms were not executed. The reason was the absence of adequate financial mechanisms, the nature of the environmental operations, and the small scale of the average farms in the region. Under these conditions, the accumulated damages to the environment and the existing level of organic waste disseminated in the farms cannot be resolved and it is the cause of the water contamination in rivers and in some areas of the reservoir waters, with slow flows.

The data collected by the Information System of ITAIPÚ shows that the water quality in the reservoir is under pressure by the level of sediments and for the frequent flowering of algae potentially toxics, and the dissemination of aquatic plants in some lateral water bodies. These symptoms are associated to the presence of nutrients and sediment transport, being a problem for the aquatic species, the multiple uses of the water, and the human health. The temporal variability of the eutrophication index (Carlson), at the San Francisco Verdadeiro Basin (bacia HELP-UNESCO/HIP) can be seen in the following Figure. In November 2003, the Eutrophic Index was 63.



## SUSTAINABILITY and RISKS

The solid technical experience, the financial capacity and compromise for an important amount of co-grants of ITAIPÚ Bi-national, are the guarantee for having the necessary support to run this Priority Project as a first experience of a private-public partnership project. In addition, this institutional existing capacity assure the GEF's resources will be used only to permit the execution of the incremental activities that ITAIPÚ Bi-national can not address under the particular characteristic of this Project. The two phases in which the project is organized, look for a close monitoring system to be established in order to evaluate the experience, and to go in deep in a Second Phase. The interest in doing this, is related to the experimental characteristic of the project to assure the experience gained at the end, can be used in the next phase to be included in its entirety in the SAP, as a proposal to expand the economic tool for water quality protection, and integrated micro-basin management.

The main risk identified with the project is in terms of the farmers' interest and commitments to use this kind of instruments. The idea of a grant is not understood to resolve environmental problems at the individual level. The producer thinks that the problems generated in his farm but affecting the environment must be pay by others, without recognizing his own responsibility. This approach must be changed and is a challenge to the "Água Boa Program", but also a risk for the success of this Priority Project. Institutionally, there are not important risks at this level do to the strong participation of ITAIPÚ Bi-national, but could be a problem in case of its replicability in other parts of the La Plata basin.

## **REPLICABILITY**

The project was identified as a public-private partnership to be replicated inside the area under ITAIPÚ Bi-national jurisdictional responsibility in Paraguay and Brazil, and in similar conditions existing at the LPBscale. Activity 1 include financial aid (US\$ 25.000), using GEF funds, to present and disseminate the experience at this level with the other three countries (Argentina, Bolivia and Uruguay), with co-financing support of ITAIPÚ Bi-national. This will be done preparing printed materials and in a workshop to present and discuss the experience and lessons learned in the execution of this Priority Project with key stakeholders of the La Plata basin. The CIC, via the FSAP, will receive the reports of the monitoring and evaluation process to follow the experience and to assure the links of this experience with other similar private enterprises of the La Plata Basin.

The fact that the Paraná and the Uruguay rivers have a large number of hydroelectric dams built, two of them (Salto Grande and Yacretá) are bi-national and have similar problems of water quality loss in its reservoirs and other water bodies upstream. The opportunities to replicate put this experience as a key one in the entire La Plata basin, using national and international financial instruments in the future, if the experience succeeds. The Monitoring and Evaluation Plan includes indicators to measure the success for the potential replication of the results of the project.

## **STAKEHOLDER INVOLVEMENT**

The opportunity open by ITAIPÚ Bi-national to develop this priority project under the “Cultivando Agua Boa” Program, with the excellent methodology for public participation already developed and proved, can assure the involvement of the local communities, indigenous groups and municipal authorities, as well of the technical capacity of the Universities and the national institutions responsible for resolving the environmental problems of the Paraná III basin. ITAIPÚ Bi-national is committed to use his own methodology to include this project as a complementary component to his Program. As can be confirm in the background information presented, the approach and methodology used by ITAIPÚ is in all aspects coherent with the GEF approach and request in this matter. Particularly the project will work in individual agreements with the farmers, which collectively are organized by ITAIPÚ Bi-national. The kind of private project will require specific agreements to have the grants in the conditions that will be developed for the grant line. As a public-private partnership this initiative is a particularly open one, to involve key stakeholders in the planning and implementation process of the Grant-based fund.

## **EXECUTION ARRANGEMENTS FOR IMPLEMENTATION**

The Priority project will be executed by ITAIPÚ Bi-national in coordination with the International Technical Coordinator of the FSAP in close coordination with the Project Director (Secretary General of the CIC) and under the proceedings agree for the execution of the FSAP. The following Diagram shows the working relations between the different institutions and the main actors involved in the Priority Project execution, as well as the responsibilities for each one of the programmed activities.

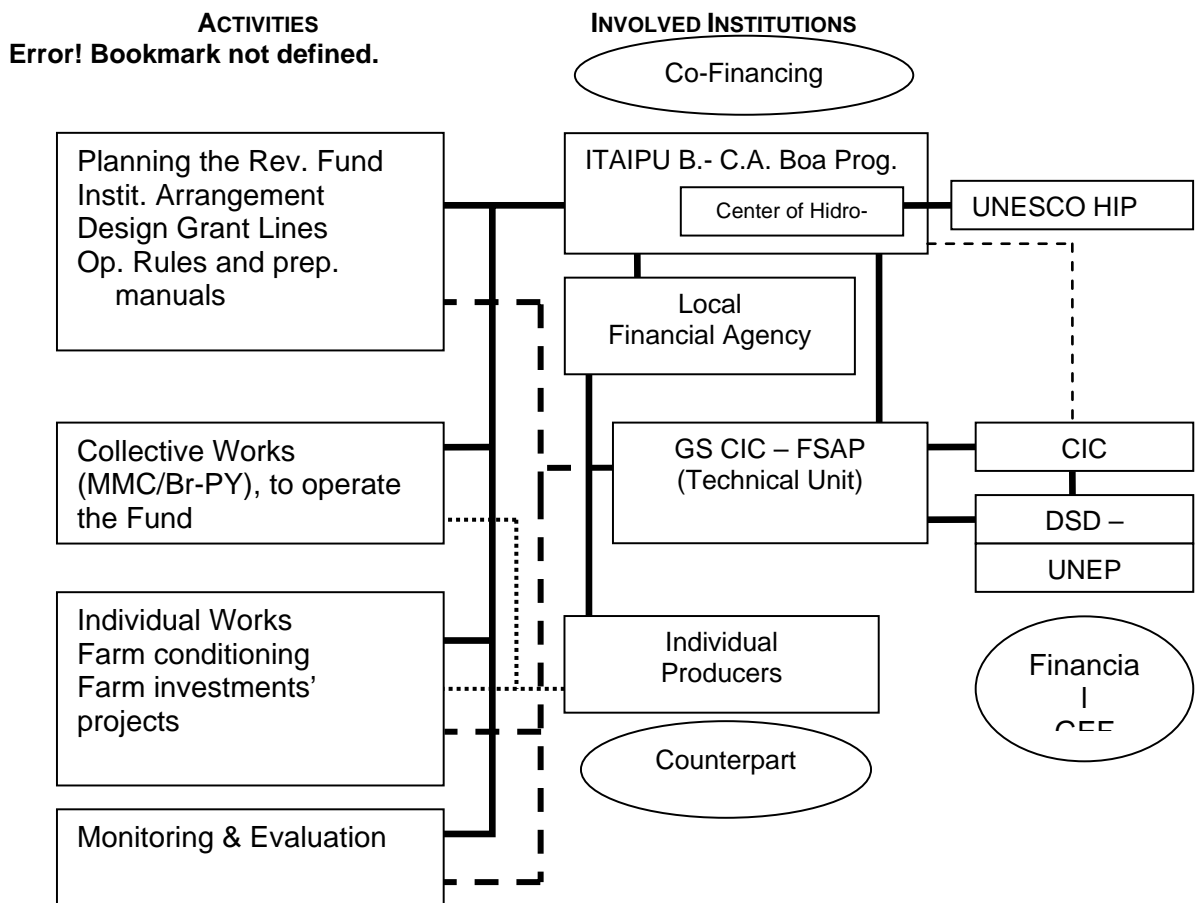
Based in the existing Agreement signed between ITAIPÚ Bi-national and the SG/CIC, a Memorandum of Understanding will be signed to execute this Priority Project; this will create the Legal base for a second Memorandum of Understanding to be signed between the SG/OAS and ITAIPÚ Bi-national, to assure the operational procedures to execute the project. These instruments will define the responsibilities of each part and procedures to be followed, as well as the results expected.

ITAIPÚ Bi-national is committed to bring the facilities and equipment to execute this Priority Project and it Program “Cultivando Agua Boa” will be the framework and capacity to create the enabling activities and to bring the local organizations and institutional relations and support, for the adequate execution of the Priority Project. In addition, the digital Latin-American Center for Hydro Information (UNESCO-HIP/ITAIPÚ/Bi-national) will support all the activities of this Project with available data and technical and scientific capacity. Finally the existing Micro basin Management Committee (MMC/Br-PY) created by ITAIPÚ Bi-national, will be the organizational link for the collective works with the farmers, indigenous groups, local authorities and Municipalities and Universities, already involved in the “Cultivando Agua Boa” Program, and will be an instrument for the M&E process.





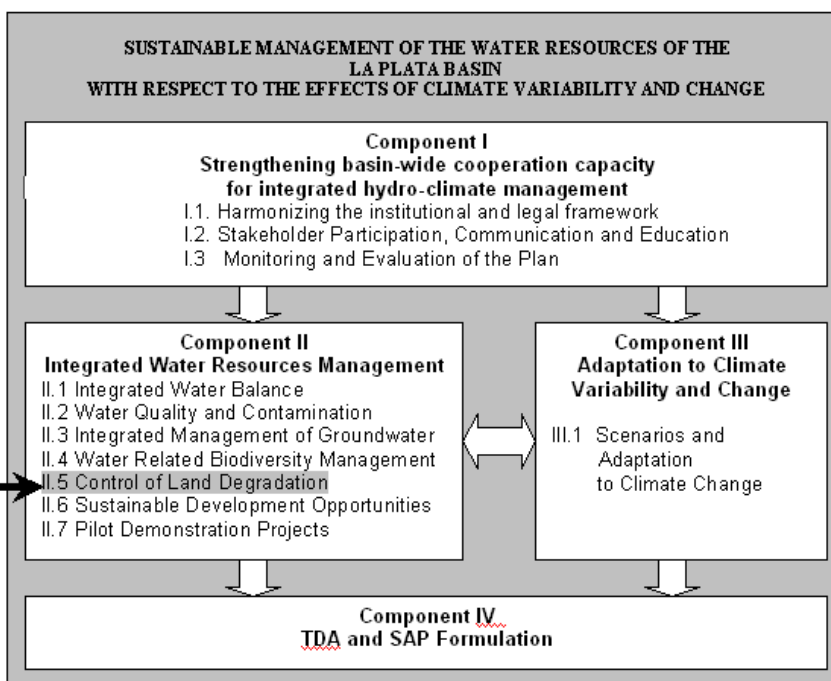
**DIAGRAM OF THE ARRANGEMENTS**



**SUBCOMPONENT**  
**II.5**  
**Control of Land Degradation**

**Part 1: Project Identifiers**

- 1.1 Sub-project title: Control of Land Degradation  
 1.2 Link to umbrella project: Component II: Integrated Water Resources Management



1.3

Geographical

La Plata Basin

scope:

1.4 Executing Agency/entity: CIC in cooperation with the following national institutions:

- Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.  
 Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.  
 Brasil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).  
 Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.  
 Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).

- 1.5 Duration: 5 years  
 1.6 Focal area(s): IW  
 1.7 GEF grant: \$ 450,000  
 1.8 Co-financing: \$ 582,000  
 1.9 Total funding: \$ 1,032,000  
 1.10 Associated financing: None  
 1.11 Contact person:

Name: Miguel Angel López Arzamendia  
 Title: CIC Secretary General and Project Director  
 Tel: (54-11) 431 22 506  
 Email: [secretaria@icplata.org](mailto:secretaria@icplata.org)

### 1.12 Project summary:

The objective of this subcomponent is to harmonize national actions related to the control of land degradation within the La Plata Basin, by consolidating regional strategies under the United Nations Convention on Desertification. The level of effort will include compiling available soil information, integrating, at a coherent scale, within the La Plata Basin, and identifying degraded critical areas, integrating water and soil concerns. Information from existing on-going projects (i.e., Bermejo, Pantanal, Gran Chaco and Pilcomayo) and MERCOSUR strategies related to desertification will be utilized to the fullest extent possible. The outcome is increased riparian country capacity to take cooperative-joint actions related to controlling land degradation, in line with the objectives outlined in the United Nations conventions UNCCD, CBD, UNFCCC and other international agreements. The outputs will include a Land degradation diagnostic analysis, findings from the Priority Activity: "Selva Misionera Paranaense (SMP)", and a basin-wide land degradation control strategy. The results will include a geo-referenced database, including land use, soil suitability, and erosion vulnerability layers. Based on an analysis of this data, a Land Degradation map, identifying high risk areas, will be prepared along with a proposal for priority actions. Additionally, a project designed for the ecosystem of the *Selva Misionera Paranaense* region will be prepared, including experiences and best practices drawn from the priority project and other GEF projects (Bermejo, Gran Chaco, and Upper Paraguay.) and commonly agreed upon actions in the La Plata Basin, complementing the National Action Programs against Desertification.

**Summary Table of Subcomponent Work Elements, Outputs and Outcomes**

Work Elements	Output	Outcome
II.5.1. Diagnostic Analysis	Output II.5.1 Land degradation diagnostic analysis	Maps generated on the basis of existing information from the Bermejo, Pilcomayo, Pantanal, and Grand Chaco priority activity provide soil and critically-degraded information
II.5.2 Priority Activity SMP	II.5.2 Priority Activity: "Selva Misionera Paranaense (SMP)"	The priority activity, in the Selva Misionera-Paranaense forest, identifies root causes of land degradation, and defines erosion control and soil rehabilitation measures by the end of the project
II.5.3. Land Degradation control Strategy	Output II.5.3 Basin-wide land degradation control strategy	Lessons learnt and good practices for sustainable land management are illustrated in the basin-wide land degradation control strategy

**Summary Table of Subcomponents Work Elements, Funding Sources, and Costs**

Work Elements	Sources of funding				Total Cost (US\$)
	GEF (US\$)	Funding	Co-financing (US\$)	(#)	
II.5.1. Diagnostic Analysis	\$330,000	22%	293500	51%	326,500
II.5.2. Priority Activity SMP	\$50,000	3%	120200	8%	170,200
II.5.3. Land Degradation control Strategy	\$70,000	5%	168300	11%	175,300
<b>TOTAL</b>	<b>\$450,000</b>	<b>45%</b>	<b>\$ 582,000</b>	<b>55%</b>	<b>\$1,032,000</b>

## Part 2: Project design

### 2.1 Background and context:

Background and introduction The La Plata Basin is one of the regions producing the greatest amount of sediment worldwide, transporting a volume of approximately 100 million tons per year in the river Paraná, measured in the city of Corrientes (Argentina), an area in which 70% of the sediment comes from the Bermejo River, the transboundary basin between Bolivia and Argentina. The critical problems associated with land degradation and desertification include: soil loss, hampered navigation, damage to energy infrastructure, decreased water quality, and degradation of the ecosystem and biodiversity.

Throughout the LPB, land degradation and desertification have been addressed in distinct GEF projects, such as the Bermejo, Alto Paraguay and Gran Chaco projects. In the Bermejo River basin the strategy is oriented to control the incremental erosion generated by human activities through structural and non-structural actions. In the Alto Paraguay River basin, one of the most important wetlands of the world is presently being threatened by the sediment buildup. In the case of the Gran Chaco, land degradation problems and the process of desertification form the major axis of analysis for integrated management.

The proposed GEF project proposes to integrate the findings from these projects and to begin addressing integrated resources management within the basin. At the same time the project will also identify other “hot-spots” experiencing degradation, and will identify interventions to resolve those concerns as well as the experiences generated by the projects currently in process.

During the development of the baseline TDA for the La Plata Basin, environmentally critical and sensitive areas were identified. The criteria used to evaluate respective levels of natural resource deterioration were based on an analysis of water-soil-climate relationships, related to losses in habitat and biodiversity. The analysis allowed for a prioritization of needs and the rationalization of a series of priority actions for the riparian countries, individually or collectively, to carry out to protect and recover critical environmental areas. Priority actions include: (i) efforts to protect the Pantanal wetlands, in the Upper Paraguay River Basin; and (ii) efforts to prevent increased land erosion and the transport of sedimentation, and to help overcome poverty-related problems in the Bermejo and Pilcomayo River Basins (this initiative is combined with the sustainable soil and water management of the Gran Chaco Americano).

The framework program for the La Plata Basin also verified the importance of protecting the Guarani Aquifer. The project’s Guarani priority activity will establish a pilot project in Itapúa (Paraguay), in the region of the Selva Misionera-Paranaense, with the objective of mitigating the impacts from the massive deforestation and increased in soy cultivation and intensive use of agrochemicals, and the subsequent impacts on the aquifer. The most degraded areas and threatened ecosystems, as a consequence of increasing development, require a joint effort and initiative from the riparian countries of the basin.

The ecosystem of the tropical-temperate forest of the Selva Misionera-Paranaense is located in the geographical center of the La Plata Basin, in a region of intense rainfall. This forest is considered one of the most deteriorated ecosystems of the world. With the American Gran Chaco in the east, and the Atlantic forest in the west, this ecosystem covers the southwest areas of Brazil<sup>1</sup> Originally, this forest ecosystem covered approximately one million km<sup>2</sup>. Today, however, the area has been reduced to approximately 58,000 km<sup>2</sup>, which represents less than 6% of the original coverage. The remaining forest formations are concentrated primarily in the Province of Misiones, in Argentina. This project includes a diagnostic analysis of the current situation and proposed measures to mitigate erosion and rehabilitate lands, with a corresponding monitoring systems.

Based on the strategies outlined in ratified documents of the Convention to Fight against Desertification, and those expressed in the National Plans to Fight against Desertification and in other examples to combat degradation with conservation and land use, the subcomponent activity will conclude with the definition of priority joint actions to be undertaken by the five riparian countries.

Statement of Issues The main critical and emerging issues related with land degradation include:

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<sup>1</sup> The west part of the states of Paraná, Santa Catarina, and Rio Grande do Sul

- *Extreme hydrologic events linked to climate variability and change*, particularly in terms of the more frequent, longer and intense floods and extensive droughts, which periodically affect some Basin communities as a consequence of the El Nino/La Nina events, with devastating social, economic and environmental effects.
- *Sedimentation* affects navigable waterways and harbors, dams and reservoirs, degrades water quality, and leads to high maintenance costs. Sedimentation, arising from increasing human-induced erosion and from human-induced land degradation due to land use changes and deforestation, threatens not only the human use of the waters of the La Plata Basin but also its ecosystems.
- *Conflicts and environmental impacts generated by water use for irrigated crops* have wide ranging impacts on downstream human uses as well as ecosystem-wide ecological impacts. Without a shared vision and recognition of the La Plata Basin as a single hydrological resource, continued sector driven demands for water can impede the distribution and appreciation of the benefits to be derived from the system for humans and nature alike. Consequently, the capacity to engage and maintain stakeholder participation in the management of the system forms a major challenge to managing the land and water resources of the Basin in a sustainable manner, especially in the face of climate variability and change.

Underlying these risks, are some barriers or impediments to change that potentially limit the effective response to these challenges by the Basin countries:

- Inappropriate land and soil use, resulting from the expansion of the agricultural frontier, and encroachment of surrounding urban areas, has significantly contributed to deforestation and soil erosion, occurring concurrently with the conversion of marginal and fragile zones to agro-production due to exceptionally high international grain prices, and increasing soil erosion. Soil losses result in the increased transport of particulates and their deposition in rivers, lakes and dams. This sedimentation of channels, waterways and harbors limits the navigability of the waterways and affects hydropower production capacity and dam capacity. Likewise, habitats and remaining ecosystems are affected. The great natural wetland corridor of the Pantanal, including the Paraguay and Paraná rivers, is showing signs of degradation, with a diminution of the necessary nutrients to support its considerable biodiversity.
- *Technological limitations on agricultural production* result in deforestation, burns and “hot house” gas emissions as diverse natural systems are replaced by crop monocultures. Removal of the natural vegetation coverage increases soil erosion and sedimentation in navigable waterways, while higher levels of agrochemical utilization result in (currently) poorly understood surface and groundwater impacts.
- *Lack of framework plans to manage the diverse demands for shared resources* in the basin is exacerbated by the fact that responsibility for various components of the system is distributed among different juridical structures in the federally and centrally governed basin countries, and that such responsibilities are poorly coordinated. Consequently, several initiatives and projects—including GEF-IW projects—have been and are being executed without a basin-wide framework, and in turn this allows for the creation and/or existence of territorially based entities to address specific issues. Current legislation does not consider the scientific linkages between climate, water and soil, so there are no harmonized regulations on water quality and land management, and only a weak pre-existing coordination capacity.
- *Weak institutions and low levels of support for assigned competencies* limit agency and societal responses to the identified challenges.
- *Lack of an integrated water resources management vision* reinforces sectoral biases, and scant information from existing meteorological stations in key regions of the Basin limits awareness of the connectivity inherent in the component waters of the La Plata Basin. A conjunctive groundwater and surface water resource management strategy is needed to resolve development issues in critical (drought prone areas) zones with low water availability, as well as in zones at risk from the diminishing availability of water due to climate change and variability.

**2.2 Subcomponent objective:** The objective of this subcomponent is to harmonize national actions related to the control of land degradation within the La Plata Basin, by consolidating regional strategies under the United Nations Convention on Desertification. The level of effort will include compiling available soil information, integrating, at a coherent scale, within the La Plata Basin, and identifying degraded critical areas, integrating water and soil concerns. Information from existing on-going projects (i.e., Bermejo, Pantanal, Gran Chaco and Pilcomayo) and MERCOSUR strategies related to desertification will be utilized to the fullest extent possible.

2.3 Environmental benefits: The ecosystems have transboundary interrelations, which require a coordinated policy that extends beyond the borders. The region urgently requires a detailed protection and recovery strategy coordinated among the countries with regard to soil degradation. So far, the countries have been acting individually or bi-nationally - without integrated coordination. Best practices to preserve and strengthen the recovery capacity of these threatened ecosystems lessen the negative impacts of degradation. The environmental impact of enhanced degradation control (from the production, transport, and removal of soil), which could be from natural as well as anthropogenic processes that degrade aquatic and land-based ecosystems, offers local and global benefits.

2.4 Overall Subcomponent outcomes: Capacity established in the riparian countries to take joint actions related to controlling land degradation within each Country according to the objectives outlined in the United Nations conventions UNCCD, CBD, UNFCCC and other international agreements.

2.5. Consistency of the sub-project with national/regional priorities and plans: The project sets forth not only national responses to land degradation but also proposes a regional approach to this shared concern. It will build upon the work accomplished in the Basin under the supervision of the United Nations Convention for The Fight against Desertification and Drought. The MERCOSUR project for the Fight against Desertification, the Degradation of Soil and the Effects of Drought during 2007 should also be taken into account.

2.6 Coordination and linkages to the umbrella project activities and other related activities in the basin The current Subcomponent is linked to the IWRM of the Basin as it involves the execution of actions related to one of the critical cross-border themes. It assures the linkages to the umbrella Component II. Other related activities in the basin are developed within the GEF Projects Bermejo, Gran Chaco, Pantanal and Freplata. In all these projects, land degradation is an important issue analyzed. The Bermejo Project has in fact generated a version of an erosion susceptibility map for the La Plata basin. Also, the Integrated Management Project and Master Plan for the Picomayo Basin includes an analysis of the repercussions of production, transportation, and removal of soil.

### 2.7 Incremental reasoning

Baseline. The phenomenon of land degradation in the region has heterogeneous effects that should also be associated with the region's heterogeneous environmental conditions, considering, in particular, the weather and the geomorphology within the diversity of ecosystems present. Essentially, the longitudinal breadth of the region can cause situations of extreme dryness. On the other hand, the high altitudes of the Andes mountain range that divides the subcontinent determines the simultaneous gradients of dryness and the temperature, which in less than 200 kilometers can go from Pacific coastal desert to the dry high plains at more than 4000 meters of altitude. This heterogeneous environment is also effected by the geographic discontinuity within which there can be a mixture of arid, semi-arid, and sub-humid dry zones. It is therefore necessary to emphasize the local results of the soil degradation phenomenon and the processes to which they are tied.

The growth of the population, though rates are declining, coupled with economic growth translates into increasing pressure on the farming border as well as on current farming areas. Independent of future scenarios, there is hope that the subcontinent can maintain the capacity to feed its population, however, there will be an intensification of farming which will translate into significant increases in the pressure on natural resources and the usage of chemicals with growing environmental costs. It is therefore necessary to reduce the pressure on resources, preserve the productivity of the current soil being used for cultivation and for livestock through the practice of sustainable land management.

Since 1992 desert zones in Latin American countries (arid and semi-arid), excluding the sub-humid dry category are estimated to have grown by 4.7 million square kilometers. Today it is estimated that the demand for exportation is one of the factors explaining growth land used for agricultural production. In Argentina, Brazil, and Paraguay there has been significant advances beyond previously established farming areas, particularly into environments of native forests and wooded savannahs. This expansion gives rise to processes of soil degradation and loss of biodiversity. This is most acute in northern Argentina, with encroachments into the el Chaco and the Paranense forest in Paraguay, as well as the Cerrado and the Amazonia. It is in this way the area of permanent grasslands associated with the raising of livestock and the areas designated for the cultivation of soybeans have increased.

The unpredictability of precipitation and of the occurrence of droughts is a result of dryness; however, episodes of drought arise equally in humid zones. During the episodes of El Niño, intense rains affected diverse areas of the continent which were alternated with severe droughts. The periods of drought did not occur with regularity, however. Within a given 10 year period, there has generally been a 1-year period of intense drought and one or two moderate droughts would likely occur. Moreover, as the greenhouse effect increases, the likelihood of drought increases both in frequency as well as intensity. Global warming of the atmosphere could have a profound influence on the intensity of the dry conditions in some areas of the Region. Currently, generalized statistical evidence on climate change in the region does not exist, however, it has been established that, in the American southern cone, the amount of precipitation on the Pacific coast has shown a clear downward trend since the early twentieth century. Though this is not proven to be an effect of permanent climate change, as it could correspond to the negative phase of a natural climatic cycle, whatever the origin of this process, the effect on the phenomenon of desertification may be profoundly negative in some areas South America.

Also the process of sediment generation and transport must be exposed. Sedimentation affects navigable waterways and harbors, dams and reservoirs, degrades water quality, and leads to high maintenance costs. Sedimentation, arising from increasing human-induced erosion and from human-induced land degradation due to land use changes and deforestation, threatens not only the human use of the waters of the La Plata Basin but also the functionality of the Basin's many ecosystems. The transboundary issue plays a particularly important role in light of the fact that sediments are both generated and deposited along shared water boundaries. As such, resolutions can only be advanced through a multi-lateral focus.

The existing projects work in an isolated manner. However, the necessity of implementing a coordinated program to control land degradation is a critical issue in the Basin, and has been discussed extensively by the riparian countries.

Increment The project contributes to a higher objective set forth by the five signatory countries to the La Plata Basin Treaty--Argentina, Bolivia, Brazil, Paraguay and Uruguay--as coordination of actions and investment in the La Plata Basin for the sustainable management of its water resources, in particular those related to the critical issues. The increments will be: assembling, analyzing, and synthesizing the country-level information into and agreed regional level using a common framework. The global benefit of this project is a coordinated effort to mitigate land degradation within the basin, which in itself implies an improvement in the quality of life for the inhabitants and the protection of the rich biodiversity which exists in this important world reserve.

Incremental reasoning. The participation of the GEF in this Subcomponent implies the commitment of the five countries of the La Plata Basin to work together in coordinated tasks, controlling common parameters and employing the same protocols, increasing the database and providing free access to all the countries of the Basin. Taking a regional approach to the action plan for land degradation at basin level has been shown to be a much more effective approach when compared to similar actions undertaken at the individual or national basin level.

#### 2.8 Working Elements - Activities – Outputs – Outcome:

Subcomponent Objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
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Subcomponent Objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<p><b>Objective</b> To harmonize national actions including key stakeholders to take cooperative-joint actions to control land degradation throughout the LPB, and to protect a critical ecosystem of over 348.000km<sup>2</sup>, and 4 million inhabitants, in line with the objectives outlined in the United Nations conventions UNCCD, CBD, UNFCCC and other international agreements</p>	<p>LPB land degradation diagnostic analysis based in a GIS map and memory</p>	<p>Existing databases and information sources. GEF Gran Chaco forest management project, Pantanal, Guarani, Bermejo and Pilcomayo projects</p>	<p>- LPB land degradation diagnostic analysis for TDA by the 3rd year.</p>	<p>Findings from diagnostic analysis incorporated into TDA-SAP process by the end of the project.</p>
	<p>Priority activity to protect the Selva Misionera-Paranaense forest (SMP) ecosystem (348.000km<sup>2</sup>, 2,4 million inhabitants).</p>	<p>National projects covering the area and GEF' Guarani project findings.</p>	<p>- Diagnostic analysis on the SMP ecosystem (348,000km<sup>2</sup>), with an inventory of mitigation and rehabilitation measures and the roles of key local and national stakeholders included in the LPB TDA by the end of year 3.</p>	<p>- Basin-wide land degradation control strategy and project to protect 48.000km<sup>2</sup> of the original SMP ecosystem, and to introduce sustainable land use to over 60.000km<sup>2</sup> of the degraded land, included in the SAP, by the end of the Project</p>
	<p>Basin-wide land degradation control strategy</p>	<p>Individual sub-bassin initiatives</p>	<p>50% complete, framework for Basin-wide land degradation control strategy agreed upon</p>	<p>- LPB common strategy and agreed actions to control land degradation affecting water resources, in the scenarios of climate change, included in the SAP.</p>



Subcomponent Objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<p>Outcome II.5.1 Maps generated on the basis of existing information from the Bermejo, Pilcomayo, Pantanal, and Grand Chaco priority activity provide soil and critically-degraded information</p>	<p>- Geo-referenced database will include land use, soil suitability, erosion vulnerability layers and land degradation GIS maps at common projection and scale (1:100.000).</p> <p>- Diffusion material and events held in each of the countries about best practices.</p>	<p>- An integrated base does not exist.</p> <p>- Sources of data projects: GEF Gran Chaco, Pantanal, Guarani, Bermejo, and the Pilcomayo projects</p>	<p>- Basin-wide wide GIS maps at common projection and scale (1:100.000), on land-use, soil-suitability, erosion, by the end of the 2<sup>nd</sup> year.</p> <p>- Report on use of technology and agro-chemicals, best practices for SLM and driving forces for land degradation.</p> <p>- Land use analysis by the end of year 3. Erosion analysis by the end of year 2.</p> <p>- LPB land degradation Diagnostic analysis for TDA by the 3<sup>rd</sup> year.</p> <p>- 50% of dissemination activities completed.</p>	<p>Findings from diagnostic analysis incorporated into TDA</p>
<p>Outcome II.5.2 The priority activity, in the Selva Misionera-Paranaense (SMP) forest, identifies root causes of land degradation, and defines erosion control and soil rehabilitation measures by the end of the project</p>	<p>- Priority activity to protect the SMP ecosystem (348.000km<sup>2</sup>, 2,4 million inhabitants). - Root causes of land degradation identified, by a diagnostic analysis, and measures proposed to protect 48.000 km<sup>2</sup> of the remaining original eroded ecosystem for rehabilitation measures covering 1/5 of the original area</p>	<p>National projects covering the area, and GEF´ Guarani project information and findings</p>	<p>Detailed GIS maps for the SMP ecosystem (348.000km<sup>2</sup>, esc. 1:250), by the end of year 2.</p> <p>- Diagnostic on the SMP ecosystem (348,000km<sup>2</sup>) with an inventory of mitigation and rehabilitation measures and key local and national stakeholders roles, included in the LPB TDA by the end of year 3.</p>	<p>- Basin-wide land degradation control strategy and project to protect 48.000km<sup>2</sup> of the original SMP ecosystem, and to introduce sustainable land use over 60.000km<sup>2</sup> of the degraded land, included in the SAP</p>
<p>Outcome II.5.3 Lessons learnt and good practices for sustainable land management are illustrated in the basin-wide land degradation control strategy</p>	<p>Common agreed actions in the La Plata Basin complementing the National Action Programs against Desertification</p>	<p>National Action Programs.</p>	<p>20% framework for agreed to action.</p> <p>Analysis of the LPB land degradation included in the TDA process, by year 4</p>	<p>LPB common strategy and agreed actions to control land degradation affecting water resources, in the scenarios of climate change, included in the SAP.</p>

### II.5.1: Land degradation diagnostic analysis

**Objective:** Possess a tool for integrating results of the various GEF projects, in order to harmonize and disseminate existing best practices at the Basin level.

**Outcome:** Level of information available in the La Plata Basin to assess the situation related to land degradation

**Output:** Land degradation diagnostic analysis included in the TDA.

**Activities:**

- a) Assess and compile basin-wide data and information on land degradation
- b) Evaluate the soil erosion processes in the basin
- c) Collect, compile and disseminate information on best-practices for land degradation control for the LPB

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Land degradation diagnostic analysis	LPB Land degradation diagnostic analysis based in a GIS map and memory	Existing databases and information sources. GEF Gran Chaco forest management project, Pantanal, Guarani, Bermejo and Pilcomayo projects	- LPB land degradation Diagnostic analysis for TDA by the 3rd year.	Findings from diagnostic analysis incorporated into TDA-SAP process by the end of the project.
a) Assess and compile basin-wide data and information on land degradation				
Improve information about soil and vegetation <ul style="list-style-type: none"> <li>▪ Systematize and compile existing information concerning soil in the La Plata Basin</li> <li>▪ Generate a soil database for the La Plata Basin</li> <li>▪ Systematize georeferenced information on natural and planted vegetation</li> </ul>		<ul style="list-style-type: none"> <li>▪ Basin-wide wide GIS maps at common projection and scale (1:100,000) showing available information about the use of soil and Procedures Manual for the codification (criteria) of the integrated map, by year 2.</li> <li>▪ Digital database for the soils of the LPB, by year 2.</li> <li>▪ Documents with the metadata of the maps or available descriptions. Document with the description of the fundamental units defined of the structure adopted and equivalence with other available classifications, by year 3</li> </ul>		
<ul style="list-style-type: none"> <li>▪ Development of Knowledge and GIS Integration</li> <li>▪ Use of remote sensors to classify soil cover</li> <li>▪ Use of remote sensors to obtain vegetation parameters</li> <li>▪ Integration of georeferenced information in a GIS</li> </ul>		<ul style="list-style-type: none"> <li>▪ Protocols of the process of making change maps for use in measuring soil and evaluating its classifications. Protocols for defining the functional types of ecosystems and preliminary versions from an image databanks, by year 4 for TDA inclusion.</li> <li>▪ Dynamic GIS with the ability to be updated with new georeferenced information on natural and planted vegetation and changes in the use of soil, LPB soil maps, and topographic (DEM) maps of the LPB, by the end of year 2.</li> </ul>		
<ul style="list-style-type: none"> <li>▪ Integrated model of the dynamics of the use of soil in the LPB</li> </ul>		<ul style="list-style-type: none"> <li>▪ Available design of a model specifically designed to explore the behaviors of the system and to generate scenarios of change. (related to I.1 and III.1), by the end of year 3.</li> </ul>		

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>b) Evaluate the soil erosion processes in the basin</b>				
<ul style="list-style-type: none"> <li>▪ Cartographic identification information of the national and international (Basin) projects, as well as identification of the areas without projects, with regard to the degradation and desertification of lands.</li> <li>▪ Compiling and consolidating information from the diverse projects in existence as they relate to the distribution of erosion (maps of susceptibility to erosion/land degradation) and channels of erosion.</li> <li>▪ Identification and quantification of machinery, agrochemical and extreme events impacts on soil use, monitoring of erosion rates and quantification sedimentation loads to dams and infrastructure works, based on existent studies.</li> <li>▪ Integration of material within the GIS database of the project</li> </ul>			<ul style="list-style-type: none"> <li>▪ Integration of susceptibility maps of erosion generated by the Bermejo Project, updated with information from the Gran Chaco, Pilcomayo and Upper Paraguay Projects, by the end of year 2.</li> <li>▪ Methodological diagrams to replicate in areas without project, based on the collection, review and analysis of existing experiences taking into account local demands for assistance in the field of land degradation, by the end of year 3.</li> </ul>	
<b>c) Collect, compile and disseminate information on best-practices for land degradation control for the LPB</b>				
<ul style="list-style-type: none"> <li>▪ Collect, harmonize and disseminate best practices of the various projects on the subject.</li> </ul>			<ul style="list-style-type: none"> <li>▪ Dissemination material and actions accomplished in each of the countries concerning best practices, by the end of year 3.</li> <li>▪ Educational and public participation activities during the first 3 years of work.</li> </ul>	

#### II.5.2. Priority project in the critical ecosystem of *Selva Misionera Paranaense*<sup>2</sup>

**Objective:** Diagnostic analysis formulated regarding the current situation and measures proposed to mitigate erosion and rehabilitate lands, with corresponding monitoring systems in a zone where no previous studies have taken place.

**Outcome:** A priority project implemented and adopted as replicable example.

**Output** Priority Activity: "Selva Misionera Paranaense (SMP)"

**Activities** a) Compile and analyze available technical information

b) Prepare SMP pilot activity

c) Implement SMP pilot activity

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Priority Activity: "Selva Misionera Paranaense (SMP)"	<u>Priority activity to protect the SMP ecosystem (348.000km<sup>2</sup>, 2,4 million inhabitants).</u>	National projects covering the area and GEF' Guarani project findings.	- Diagnostic on the SMP ecosystem (348,000km <sup>2</sup> ) with an inventory of mitigation and rehabilitation measures and key local and national stakeholders roles, included in the LPB TDA by the end of year 3.	- Basin-wide land degradation control strategy and project to protect 48.000km <sup>2</sup> of the original SMP ecosystem, and to introduce sustainable land use over 60.000km <sup>2</sup> of the degraded land, included in the SAP or to be managed independently, by the end of year 2
(a) Climate and hydrology of the region. (b) Delimitation, current land use and tendencies;			Existing information collected and consolidated as it relates to:	

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
characterization of the project areas, (c) National, regional and local projects for recovering ecosystems and the natural resources, and institutions involved (d) Institutions with the technical capacity to manage land and water resources, forest resources, ecosystem and environmental monitoring (e) Rural and urban population characterization (including distribution, age, sex, educational level, and activity). (f) Main transportation, production and energy infrastructure.			a climate and hydrology; b. current land use and tendencies; c. national, regional and local projects for recovering ecosystems and the natural resources, and institutions involved d. Institutions with the technical capacity to manage land and water resources, forest resources, ecosystem and environmental monitoring, by the first trimester of the stating of this activity. e. rural and urban population characterization; f. main transportation, production and energy infrastructure, by the first trimester of the stating of this activity.	
b) Prepare SMP pilot activity				
<ul style="list-style-type: none"> <li>▪ The consultant will prepare a project proposal using as references the GEF's Strategic Focal Areas criteria and respecting GEF's formats and requirements for a medium size project (with a maximum contribution of US \$1,000.000 from this Fund).</li> <li>▪ Particularly in this case, it should be considered the possibility of taking advantage of base programs, projects and activities already being developed in the region, and the need to have additional funds from GEF to strengthen and complement them. This document will be prepared during a month and presented for revision to each participating country (with a meeting at each country). After finalizing the document (based in the contributions received from the countries), the final project proposal will be presented in a regional meeting which should include the key stakeholders that will be involved in the Project preparation phase.</li> </ul>			<ul style="list-style-type: none"> <li>▪ A GEF project document for a MSP, to be included in the SAP or to be managed independently, approved by the 3 participating countries through the CIC, with preliminary commitments of co-financing, by the end of the first year of the activity.</li> </ul>	
c) Implement SMP pilot activity				
<ul style="list-style-type: none"> <li>▪ The financing management of the Priority Activity will be taken care by countries in coordination within the CIC and with support of the framework program. A financing plan will be prepared based on the preliminary contacts carried out during the Project preparation phase.</li> </ul>			<ul style="list-style-type: none"> <li>▪ Commitments for the co-financing of the GEF MSP, endorsed by the countries Focal Points, and approved by the framework program of the CIC, by the end of year 2, or included in the SAP by the end of the Project.</li> </ul>	

### II.5.3 Define harmonized actions at regional level

Objective: Commonly agreed upon actions in the La Plata Basin, complementing the National Action Programs against Desertification

Outcome: creation of the capacity of the countries of the LPB to take joint actions related to the degradation of lands.

#### Output II.5.3 Basin-wide land degradation control strategy

- a) Compile and integrate information and lessons learnt

## b) Prepare basin-wide land degradation control strategy

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output II.5.3 Basin-wide land degradation control strategy	<b>Common agreed actions in the La Plata Basin complementing the National Action Programs against desertification</b>	National Action Programs.	20% framework for agreed to action.  <b>Analysis of the LPB land degradation included in the TDA process, by year 4</b>	<b>LPB common strategy and agreed actions to control land degradation affecting water resources, in the scenarios of climate change, included in the SAP.</b>
<b>Activities a) Compile and integrate information and lessons learnt</b>				
<ul style="list-style-type: none"> <li>- Identification of the scope of the National Action Programs (NAP) in the fight against desertification and their laws</li> <li>- Consideration of the MERCOSUR strategy concerning the fight against desertification, land degradation, and the effects of drought.</li> </ul>		<ul style="list-style-type: none"> <li>- A proposal for a common reference guideline for the La Plata Basin through comparative analysis of the National and Regional Action Programs, by the end of year 2.</li> </ul>		
<ul style="list-style-type: none"> <li>o Integrated analysis of the existing projects with methodological diagrams for replicability.</li> </ul>		<ul style="list-style-type: none"> <li>- Identification of degraded critical areas integrating water and soil concerns at basin level, by the end of year 2.</li> <li>- Methodological diagrams as a result of the lessons learned to be replicated in established zones by the five countries, by the end of year 3.</li> <li>- Search for financing for new projects, by the end of year 4, to be included in the SAP.</li> </ul>		
<b>Activities b) Prepare basin-wide land degradation control strategy</b>				
Design of common actions to be included in the Strategic Program, regarding the fight against desertification, land degradation, and the effects of drought.		<ul style="list-style-type: none"> <li>- Strategic actions to be integrated into the SAP, by the end of year 4.</li> </ul>		

## 2.9 Budget:

## GEF Budget

Concept by Element	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200 Consultants	\$36.000	\$24.000	\$19.000	\$12.000	\$0	\$91.000
2200 Subcontracts with Institutions	\$28.000	\$56.000	\$56.000	\$0	\$0	\$140.000
3200 Workshops and Training	\$59.000	\$25.000	\$55.000	\$35.000	\$15.000	\$189.000
4100 Equipment and Supplies	\$0	\$0	\$0	\$15.000	\$15.000	\$30.000
<b>Total</b>	<b>\$123.000</b>	<b>\$105.000</b>	<b>\$130.000</b>	<b>\$62.000</b>	<b>\$30.000</b>	<b>\$450.000</b>

## Consultants to be hired for the project

Consultant Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
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Consultant Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
<b>Local Technical Assistance</b>			
Land degradation: Consultant 1	750	27	Database of the soil use in the Basin
Land degradation: Consultant 2	750	27	Information and evaluation of the processes of erosion
Land degradation: Consultant 3	750	7	Dissemination of results
Land degradation: Consultant 4	750	13	Collecting information based on the Selva Misionera
Land degradation: Consultant 5	750	8	Project preparation
Land degradation: Consultant 6	750	40	Identification of strategic actions

### 2.10 Timetable:

Working Elements	Activities	Timeline of Activities																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>II.5.1 Articulation and complementation of actions</b>																					
	1 Land use																				
	2 Erosion																				
	3 Dissemination																				
<b>II.5.2 Selva Misionera</b>																					
	1 Information																				
	2 Formulation																				
	3 Roundtables																				
<b>II.5.3 Harmonized actions at regional level</b>																					
	1 Integration																				
	2 Strategic actions																				

**2.11 Cost effectiveness** Cost effectiveness at the technical and economic levels can be maximized by developing focused pilot interventions in multi-national areas, which can be replicated at the basin level in conformity with regional guidelines and agreement. In this way, attention is drawn to the Project in the Selva-Misionera which will allow for the analysis of a degraded basin in this area of Brazil and Paraguay, comparing it with the area in Argentina where the system has not experienced degradation. Recovery measures will be designed in an integrated way based on this analysis. The possibilities of replicating the project will be broad.

Cost effectiveness is two-fold when dealing with transboundary problems associated with land degradation and the transport of sediments of at the basin level, optimizing both human and financial resources through (1) considering the transboundary dimensions of the issue to be addressed and (2) addressing transboundary issues in such a manner as to yield global benefits. The joint analysis by the five countries allows for positive steps to be taken to address regional asymmetries and leveling skills, with lower costs and additional benefits for future development offered through integration. Additionally, technical and economic benefits will be maximized due to the synergy achieved through joint action at the local and basin level, particularly with the regional GEF projects.

## 2.12 Risk Analysis

Risk	Rating (L/M/H)	Risk Mitigation Measures
The project does not integrate the existing projects in the region	M	The key institutions acting in this field are involved in the project
Geographic extent of the Basin, which is a limitation to effective and efficient participation and the active involvement	L	Strong linkages with civil society, professional bodies, and relevant governmental bodies will minimize this risk

**2.13 Sustainability:** Project activities and implementation are designed (including the public involvement and the process of stakeholder participation) to achieve sustainability. All of the activities form the foundation of a multi-sector, multi-institutional, and basin-wide arrangements for the implementation of the control system. The project will be carried out by relevant government agencies, and will strengthen the existing institutional and human capacities. The networks will be integrated at an agreed upon regional level using a common framework, which maintains national responsibility for executing the action plan established for this stage.

**2.14 Replicability:** The results of the Project will be disseminated through governmental institutions, nongovernmental organizations, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including the institutions related thereto in each of the five countries, will permit the development of information transfer mechanisms to share new knowledge and provide for active coordination and horizontal cooperation in the integrated management of the water resources of the Basin. The pilot project deals with a common upstream problem in the Basin and the insight obtained will be easily adopted at the regional level through the process of dissemination. Since all of the proposed activities are multifaceted in nature and include a strong multi-stakeholder participation element, which will contribute to the “buy-in” of the project constituencies, the prospect of replicating such activities are high and can be achieved with minimal effort by exchanging relevant information and experiences learned.

**2.15 Execution arrangement:** Riparian national institutions dealing with land management issues; National Project Units, INTA and INA, and Provincial institutions in Argentina; MDS in Bolivia; EMBRAPA in Brazil; MAG-SEAM in Paraguay; and RENARE-MGAP, INIA and UDELAR in Uruguay

**2.16 Public participation mechanisms.** The participative dimension strengthens Basin governance, and is present in each of the activities to be executed during the project. Promoting public participation in this project is integral and present throughout the process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society — with a special focus on gender equity and indigenous peoples. This involvement will also favor appropriations and the social sustainability of the action plan during both its formulation and implementation, including the consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

**2.17 M&E** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

## Process Outcomes and Indicators

Process OUTCOMES		Process INDICATORS	
Multi-country agreement on transboundary priority concerns, impact and cause			<ul style="list-style-type: none"> <li>▪ Preparation of soil maps at common scale in the La Plata River Basin; maps of critical degraded areas; soil-suitability maps; and erosion susceptibility maps, utilizing information from on-going projects: Bermejo, Pilcomayo, Pantanal, and Grand Chaco.</li> <li>▪ Designed Priority Project in the Paranaense Forest including baseline assessment and root causes analysis of land degradation, development of erosion control measures and soil rehabilitation measures and respective monitoring systems by the end of the project.</li> <li>▪ Harmonized actions agreed at regional level, based on the strategies outlined in the ratified documents of the Desertification Convention and National Action Programs against Desertification</li> </ul>
Multi-country agreement on governance reforms and investment to address priority transboundary concern			<ul style="list-style-type: none"> <li>▪ Constitution of the Technical Group of the CIC relating to Land Degradation as and advisory committee for the execution of the Subcomponent 2 months after the beginning of the Project .</li> <li>▪ Reports and minutes of meetings of the Technical Group of the CIC concerning water quality.</li> </ul>
Effective national Inter-ministry Coordination			<ul style="list-style-type: none"> <li>▪ Inter-ministerial mechanism established at the national level to agree to the execution of the Land Degradation Subcomponent (national group).</li> <li>▪ Inter-ministerial agreement of the agencies involved in each country to define the representation of the Technical Group of the CIC concerning land degradation.</li> <li>▪ Reports and minutes of meetings of the national groups.</li> </ul>
Stakeholder involvement			<ul style="list-style-type: none"> <li>▪ Increase awareness of and participation in Land Degradation project activities through more than xx workshops and meetings with local authorities, institutions, and stakeholders.</li> <li>▪ Preparation and wide dissemination of project-related documentation and project-related activities for civil society.</li> <li>▪ Public education and awareness mechanisms defined and implemented by the end of the project</li> </ul>
Transboundary waters legal framework adopted and/or strengthened			<ul style="list-style-type: none"> <li>▪ Proposal of legal framework in agreement with the CIC</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions			<ul style="list-style-type: none"> <li>▪ Cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>▪ Institutional strengthening provided to institutions related to the water quality and contamination.</li> </ul>



**ANNEXES****Annex 1: Terms of Reference for Consultants****Consultant 1****Objective:**

Land use database for the Basin

**Activities:**

The consultant must prepare the agenda for a meeting of experts of the countries in the use of soils such that following such a meeting the consultant will possess the relevant information which exists on the theme. Based on this information, the consultant will evaluate the information and develop a proposal for a common strategy to be followed by the countries.

This strategy will be given to the countries for their consideration and commentary which will serve as the basis for establishing a strategy to use in creating a soil use database for the Basin. The consultant will work collaboratively with the countries to get the database operational.

**Results:**

A land use database available for the La Plata Basin.

**Duration**

The duration of this task will be 36 months

**Consultant 2****Objective:**

Information and evaluation of the processes of erosion

**Activities:**

The consultant must prepare the agenda for a meeting of experts of the countries to identify national and international (Basin) cartographic information, identifying areas without current projects, as related to land degradation and desertification. The consultant will design a strategy to collect and consolidate information from various existing projects related to distributed erosion (erosion susceptibility maps, land degradation) and erosion channels.

Identification and quantification of machinery, agrochemical and impacts of extreme events on soil use, monitoring of erosion rates and quantification of sedimentation loads to dams and infrastructure works, based on existing studies.

Integration of the material in the projects GIS base/

**Results:**

Presentation of an integrated erosion susceptibility map generated for Project Bermejo, created with information from the Gran Chaco, Pilcomayo and Upper Paraguay Projects.

Methodological documents for replication in areas without projects, based upon the collection, revision, and analysis of existing experience and the territorial demands for assistance related to land degradation.

**Duration::**

The duration of this task will be 24 months

**Consultant 3****Objective:**

Dissemination of results

**Activities:**

The consultant shall create a Dissemination Plan to collect, harmonize and communicate the best practices of the various projects related to the theme. The consultant shall design a strategy and prepare the material to be distributed.

**Results:**

Communications events and material distributed in each of the countries regarding best practices.

Educational and public participation activities.

**Duration::**

The duration of this task will be 6 months.

#### **Consultant 4**

**Objective:**

Collection of information concerning Selva Misionera

**Activities:**

The consultant shall collect information relating to: (a) Climate and hydrology of the region. (b) Delimitation, current land use and tendencies; characterization of the project areas, (c) National, regional and local projects for recovering ecosystems and the natural resources, and institutions involved (d) Institutions with the technical capacity to manage land and water resources, forest resources, and ecosystem and environmental monitoring (e) Rural and urban population characterization (including distribution, age, sex, educational level, and activity). (f) Main transportation, production and energy infrastructure.

**Results:**

Presentation of all the information collected

**Duration**

The duration of this task will be 3 months

#### **Consultant 5**

**Objective:**

Preparation of the Priority Project in the critical ecosystem of *Selva Misionera Paranaense*

**Activities:**

The consultant will prepare a project proposal using as references the GEF's Operational Programs OP #15, OP #12 and OP #9, and respecting GEF's formats and requirements for a medium size project (with a maximum contribution of US \$1,000.000 from this Fund). Particularly in this case, the consultant will consider base programs, projects and activities already being developed in the region, and leverage additional funds from GEF to strengthen and complement them. This document will be prepared during a month and presented for revision in each participating country (with a meeting at each country). After finalizing the document (based in the contributions received from the countries), the final project proposal will be presented in a regional meeting which should include the key stakeholders that will be involved in the Project preparation phase.

**Results:**

A GEF project document of medium size, approved by the three participating countries (within the framework program and the CIC) with preliminary commitments for co-financing

**Duration::**

The duration of this task will be 3 months

#### **Consultant 6**

**Objective:**

Identification of strategic actions

**Activities:**

Design common actions to be included in the Strategic Program, considering the fight against desertification, land degradation and the effects of drought, based on existing information and the information generated through expert meetings.

**Results:**

Development of a Strategic Plan of Action

**Duration:**

The duration of this task will be 18 months

## Annex 2: Detailed of Pilot Project for the Selva Misionera-Paranaense Protection

### PROJECT SUMMARY

#### Background

Located in the geographical centre of the La Plata Basin, in a region of intense rainfall, the ecosystem of the tropical-temperate forest of the Selva Misionera-Paranaense is considered one of the most deteriorated ecosystems of the world. With the American Gran Chaco in the east, and the Atlantic forest in the west, this ecosystem covers the Southwest of Brazil (west part of the states of Paraná, Santa Catarina, and Rio Grande do Sul), the Departments of the east part of Paraguay, and the provinces of Misiones and north of Corrientes in the Argentinean Northwest. Originally, this forest ecosystem covered an extension of approximately one million km<sup>2</sup>. Today the area has been reduced to approximately 58,000 km<sup>2</sup>, which represents less than 6% of the original coverage. The remaining forest formations are concentrated primarily in the Province of Misiones, in Argentina (as shown in satellite image of figure 1).



Figure 1. Province of Misiones in Argentina

Since the beginning of the South American colonization, the rich forest of this ecosystem (particularly important due to its biodiversity and the presence of valuable endemic species such as the Brazilian pine [*Araucaria Brasiliensis*] and the tea herb [mate], among others) has been historically exposed to serious anthropogenic interventions. The good climate and fertility of lands turned this region into the great Brazilian coffee producer. Today's productive cycle changed and is characterized by intense cattle ranching and continuous agricultural expansion (mainly for soya) further jeopardizing what is left of the remaining forest area.

The Misionera-Paranaense forest stands out for its biodiversity. More than 2000 species of plants have been found in this forest; its rivers and lakes are habitat for more than 330 species of fishes; more than 150 species of reptiles, 70 amphibians, 550 birds and 100 mammals are found; besides a huge quantity of insects and arthropods. The presence of the water quantity and quality has been crucial for the vitality and productivity of this sensitive ecosystem. Two of the largest rivers of the La Plata Basin, the Paraná and the Uruguay and their tributaries, besides channeling surface runoff, they play a key role recharging water to important aquifers in the region, such as Guaraní and the Sierra General. The enormous hydroelectric potential of these huge rivers have turned this region into the largest concentration of dams in South America; two of them among the largest in the world: the binational dams of Itaipú (Brazil and Paraguay) and Yacyretá (Argentina and Paraguay).

The increased erosion, generated by the expansion of the agricultural lands, has increased the sedimentation loads to the reservoirs of Itaipú (on the Paraná River) and Salto Grande (on the Uruguay River), by an estimated three fold since their construction. In addition to the region's richness and abundance of water resources, the Iguazú falls, comprising triple border line with Argentina-Brazil-Paraguay, represents a world class tourism attraction, and therefore, requires a comprehensive environmental management plan, agreed and supported among the three countries.

Due to the environmental richness, agricultural and tourist potential, and strategic location in the centre region of the East-West and North-South communications axis of South America, the region has been historically exposed to strong anthropogenic activity, which tends to further increase with a prognosis of heavy investment in infrastructure (roads, gas pipelines, waterways, and others).

The region also includes very important urban developments like the city of Curitiba in Brazil, the cities of Foz do Iguaçu and Puerto Iguazú located in the triple border line among Argentina, Brazil, and Paraguay, and the city of Posadas located in Argentina. The rural areas in the region are characterized by small properties heavily impacted by soil degradation and lost of productivity (enhancing migration to new more productive areas). The process of expansion to new agricultural frontiers is further worsened by the high price of the agricultural commodities on the international market. Indigenous groups in the region end up being relocated to marginal areas or to the very few protected forest areas remaining from the original rich ecosystem.

### **Project rationale**

Critical and sensitive areas were identified during the development of the framework program for the La Plata Basin. The criteria used to evaluate the level of deterioration of the natural resources were based on the analysis the water-soil-climate relationships related to losses in habitat and biodiversity. The analysis allowed to prioritize needs and to rationalize a series of actions and projects that the countries of the La Plata Basin, individually or collectively, need to carry out to protect and recover critical environmental areas. Priorities that stand out include: (i) efforts to protect the Pantanal wetlands, in the Upper Paraguay River Basin; and (ii) efforts to prevent the increased land erosion and the sedimentation transport, and help overcome poverty problems in the Bermejo and Pilcomayo River Basins (this initiative is combined with the sustainable soil and water management of the Gran Chaco Americano).

The framework program for the La Plata Basin had verified the importance of protecting the strategic Guaraní Aquifer. The Guaraní Project had located the pilot project of Itapúa (Paraguay) in the region of the Selva Misionera-Paranaense with the objective to verify the effects from the massive deforestation and increase soya cultivation (and intensive use of agrochemicals) on the aquifer. The most degraded areas and threatened ecosystems (as a consequence of increasing chaotic development), require a joint effort and initiative from the three countries of the La Plata Basin.

The Selva Misionera-Paranaense urgently requires a detailed protection and recovery strategy coordinated among the countries. So far the countries have been acting individually or bi-nationally - without integrated coordination. The rationale of this project is to take into consideration the various actions already being planned and implemented in region – and to move forward with integrated, complementary strategic actions to further refine, enhance, and optimize current best practices to preserve and strengthen the recovery capacity of these threatened ecosystems. Of course, this sustainable development strategy must be coordinated by the three countries.

### **Project Objectives**

The purpose of the Priority Study is to prepare a Priority Project, of medium size for GEF, which focuses on the protection, recovery and sustainable development of the Selva Misionera-Paranaense ecosystem. The project will focus and organize the action of local, provincial, state and regional stakeholders, as well as the national institutions from the three involved countries into a agreed process of sustainable development within the framework and with the support of the CIC.

The project includes the formulation of a diagnostic analysis of the current situation and proposed measures to mitigate erosion and rehabilitate lands, with corresponding monitoring systems. The initial challenge of this priority study relates to prioritizing the project objectives of a region characterized by a valued ecosystem due to its original biodiversity, highly degraded and eroded soils (due top massive deforestation), intense precipitation, inadequate agricultural use, and increased sedimentation and contamination transport to global important water bodies (mainly used by energy generation and navigation) causing serious water quality problems.

In principle, it is recommended to prepare the Project under the GEF's Operative Program #15, with direct relationship to GEF's Operative Program #9 of Waters and Lands and GEF's #12, Integrated for Ecosystems. This initiative will allow supporting the causes of the land use changes in the region, including the forest and farming lands, help solve poverty problems of the local population, and help manage the subsistence of the indigenous cultures of this region.

Specific objectives of the project include:

- Soil reclamation and sustainable land use by improving productive systems (including farming);
- Decreasing soil erosion levels, sedimentation of reservoirs, and eutrophication;
- Conservation and recovery of the original ecosystems under sustainability conditions;

- Development of a system of protected areas in the region (including initiatives for biological corridors);
- Development of an coordinated institutional initiative among the three countries involved in the framework of the CIC, with attention to their administrative structure and jurisdictional competence, including the participation of the current successful public and private initiatives, such as those of Itaipú Binational with the Good Water Program and others, the protection projects of Yacyretá Binational, as well as the civil society organizations;
- Development of monitoring program;
- Conduct of educational and public participation activities; and
- Articulation and complementation of actions with existing projects related to the issue within the La Plata Basin.

### **Expected project outcomes, with underlying assumptions and context**

The expected result is a trinational agreement (of the three participating countries), carried out within the CIC framework, based on a Medium Size Project document, which identifies the objectives, activities, and expected results of the project "Ecosystem Protection of the Selva Misionera-Paranaense". The outcomes should be generated based on a participative process involving stakeholders and institutions concerned with the development of the region.

This final product will be the result of substantial information given by the organizations and institutions linked with the initiatives and of the coordination effort carried out by the framework program and the CIC. These results and products will constitute the first step to help reduce degradation of the ecosystem including the soil and the water bodies shared among the three countries (Argentina, Brazil, and Paraguay) and will contribute to improving production conditions and the quality of life of the local populations.

Global final benefits include promoting conservation and biodiversity reclamation, transboundary water quality improvement, soil recovery, and enhancing environmental and landscape values of global importance. The project will also help accomplish the objectives outlined in the United Nations conventions UNCCD, CBD, UNFCCC and other international agreements.

### **Activities and financial inputs needed to enable changes**

The three activities foreseen during the preparation of the Priority Study include:

#### ***Recompilation and analysis of the information***

The activity to recompile and analyze the information on the region's ecosystems will be carried out by the framework program, through guidelines, sent by the National Coordinators to the participating institutions in the region. The preparation of the guidelines and the analysis of the necessary information will be performed by a consultant hired for a period of four months (the first two months to analyzing the existing information and the other two to prepare a conceptual Project for discussion with stakeholders).

The aspects to be covered are:

- Climate and hydrology of the region:
  - Precipitation, geographical distribution, annual and tendencies;
  - River flow measurements (maximum, average, and minimum flows)
  - Temperatures, annual and tendencies;
  - Evaporation and evapotranspiration, geographical distribution, annual and tendencies;
  - Characterization of climate and tendencies, variability, and change;
  - Hydrography of the region's main rivers, including basin, sub-basins and micro basins;
  - Base Map of the Guaraní Aquifer System; and
  - Information on the Guaraní Aquifer and other aquifers of the region.
- Delimitation, current land use and tendencies; characterization of the project areas
  - Actual land use maps and satellite images of the study area showing dynamic changes during critical periods, with the differentiation of agricultural, cattle and lower forest areas. Critical land degradation areas;
  - Forest covering remnants from the original ecosystem per country, distribution, critical use and causes;
  - Deforestation and reforestation areas classified by category and causes;
  - Evolutional analysis of deforestation process;
  - Selection of feasible areas for implementation of ecological corridors;

- Evaluation of the need and feasibility to implement nurseries (trees and plants) and forestation projects;
  - Promote technical cooperation and training, and social participation; and
  - Existing protected Areas and proposals.
- National, regional and local projects for recovering ecosystems and the natural resources, and institutions involved
  - Institutions with the technical capacity to manage land and water resources, forest resources, ecosystem and environmental monitoring;
  - Rural and urban population characterization (including distribution, age, sex, educational level, and activity).
  - Main transportation, production and energy infrastructure.

The consultant will analyze the information in an integrated way with a comprehensive vision of the region, identifying the main problems and challenges for the sustainable development of the region and critical areas. The objective is to select and prioritise actions and include key stakeholders. The consultant will present the results of the analysis in an organized and structured way (pre-defined and agreed).

### **Preparation of the Project**

The consultant (in direct contact with the International Coordinator of the framework program and keeping the Director of the Project well informed), will prepare a project proposal using as references the GEF's Operational Programs OP #15, OP #12 and OP #9, and respecting GEF's formats and requirements for a medium size project (with a maximum contribution of US \$1,000.000 from this Fund). Particularly in this case, it should be considered the possibility of taking advantage of base programs, projects and activities already being developed in the region, and the need to have additional funds from GEF to strengthen and complement them. This document will be prepared during a month and presented for revision at each participating country (with a meeting at each country). After finalizing the document (based in the contributions received from the countries), the final project proposal will be presented in a regional meeting which should include the key stakeholders that will be involved in the Project preparation phase.

For the Project preparation phase, it should be considered contributions from the component II.2: Integrated Management of the Water Resources, specially the activity of Land Degradation Monitoring.

The result will include a GEF project document of medium size, to be approved by the three participating countries (within the framework program and the CIC) with preliminary commitments of co-financing.

### **Project Financing Management**

The financing management of the Priority Project will be taken care by countries in coordination within the CIC and with support of the framework program. A financing plan will be prepared based on the preliminary contacts carried out during the Project preparation phase.

As a result of the activity, it is expected to obtain commitments for the co-financing of the GEF medium size Project, endorsed by the countries Focal Points, and approved by the framework program of the CIC.

### **SUSTAINABILITY**

The objective of the project is to recover, protect and preserve the existing ecosystem by coordinating, integrating and strengthening actions already being implemented in the region by the countries. The project would therefore not start from the beginning, but would strengthen and supplement already existing initiatives, by setting up an institutional framework to coordinate the trinational efforts. The project financing will be supported basically by local initiatives that would be complemented by the GEF funds up to US \$1 million (reducing considerably the dependence of the trinational project to these resources). The region has very well structured institutions and organizations to support and promote the project, such as the binational hydropower generation entities, the transportation entities, and the various institutions and organizations from the private sector. The sustainability of the project will be determined by the development of this integrated and coordinated initiative. The expected success includes land reclamation, implementation of sustainable production practices, and decreased erosion rates and sedimentation, will promote and stimulate regional sustainability within the long term (through regional less bureaucratized coordination).

**REPLICATION**

The Project will concentrate its activities on critical areas through specific actions agreed by the involved stakeholders. The replication of these experiences can be further applied to the contiguous threatened ecosystems. Due to the unique characteristics of the Selva Misionera-Paranaense ecosystem, it is not certain that the protection and recovery techniques applied to this specific ecosystem can be easily replicated to other ecosystems; however, the methodology developed and used, based on a participative approach, can certainly be applied to other very distinct and challenging projects. It is expected that the design of this medium size Project, includes funds to develop and implement evaluation indicators to measure project success. The project results as well as the experiences from the framework program will be disseminated throughout the region.

**PARTICIPATION OF THE INTERESTED STAKEHOLDERS**

The main stakeholders will be involved through a unique working methodology developed for this GEF medium size Project, which integrates, coordinates, and strengthens the existing initiatives in the region. The stakeholders involvement, commitment, and participation, since the beginning, through all project phases, is therefore fundamental to achieve project success – and includes looking for partners that are already working in the region, such as academic institutions, universities, etc.; local institutions such as municipalities and basin organizations; regional institutions such as Binational Commissions; and agencies and institutions created by the countries for specific purposes such as the Itaipú Binational and the Yacyretá Binational, or the COMIP (Mixed Commission Argentinean-Paraguayan of the Paraná river); the state and provincial agencies and associated institutions, acting on different issues, and finally the cooperative producers organizations and private companies.

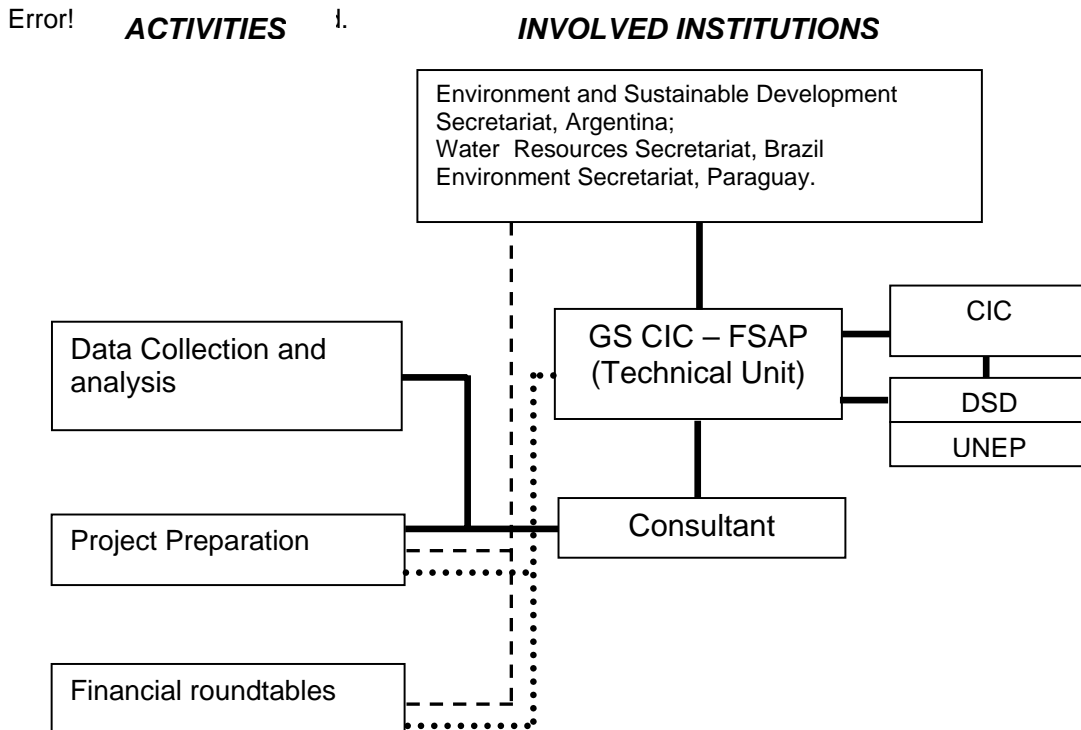
**MONITORING AND EVALUATION PLAN**

A monitoring and evaluation plan should be included as a project activity using a set of indicators selected by the consultant based on the detailed analysis of the baseline information of the region and ecosystem.

## EXECUTION ARRANGEMENTS FOR IMPLEMENTATION

The study for the preparation of the Priority Project will be part of the framework program. Therefore it will be technically coordinated by the International Technical Coordinator, under the close guidance of the Project Director, and in close relationship with the National Coordinators of the three participating countries.

### Diagram of the Arrangements:

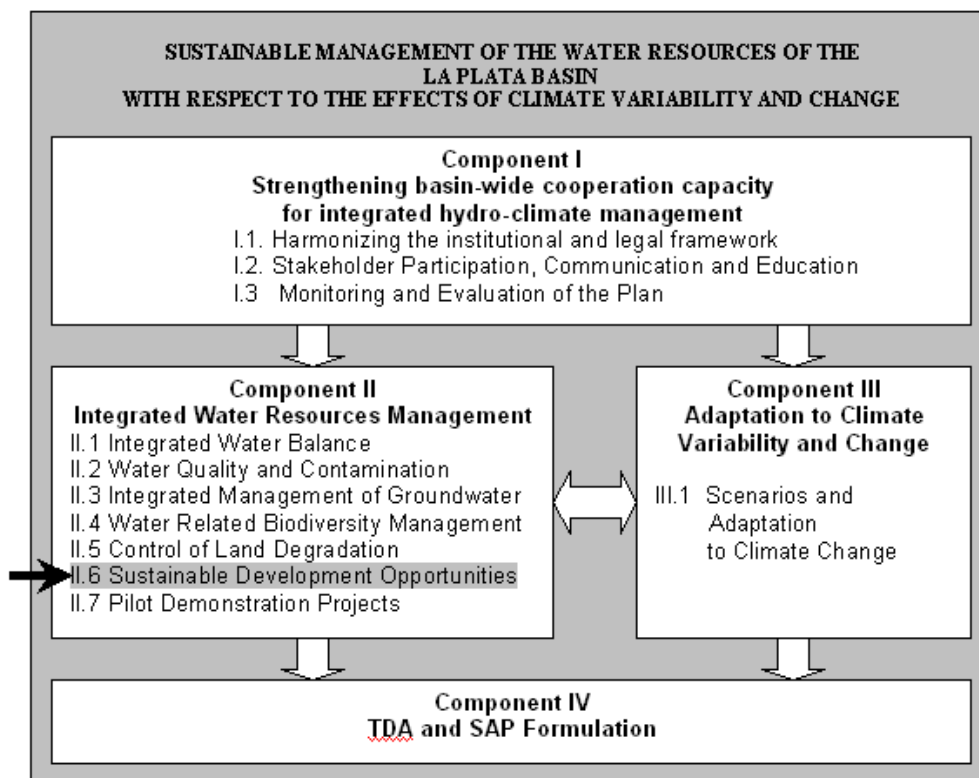




**SUBCOMPONENT**  
**II.6**  
**Identification of Sustainable Development Opportunities**

**Part 1: Project Identifiers**

- 1.1 Sub-project title: Identification of Sustainable Development Opportunities  
1.2 Link to umbrella project: Component II: Integrated Water Resources Management



- 1.3 Geographical scope: La Plata Basin  
1.4 Executing Agency/entity: CIC in cooperation with the following national institutions:  
Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.  
Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.  
Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).  
Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.  
Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).  
1.5 Duration: 5 years  
1.6 Focal area(s): IW  
1.7 GEF grant: \$ 250,000  
1.8 Co-financing: \$ 321,800  
1.9 Total funding: \$ 571,800  
1.10 Associated financing: None

**1.11 Contact person:**

Name: Miguel Angel López Arzamendia  
 Title: CIC Secretary General and Project Director  
 Tel: (54-11) 431 22 506  
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**1.12 Project summary:** The objective is the identification and development of sustainable practices for the management of common issues in two or more basin countries, through coordination of activities with shared objectives. This subcomponent concentrates on the identification and preparation of activities and the mobilization of financing for inclusion of sustainable development principles in the following two activity areas: (1) projects that promote a regional strategy to reduce greenhouse gases and mitigate climate change by way of clean technologies and carbon capture, and (2) projects that promote ecotourism and navigation among the islands, coastal waters and wetlands of the Uruguay River, valuing environmental, cultural and historical resources through the utilization of equipment constructed in the Lower Uruguay River and promotion of a public-private partnership to finance implementation. Existing treaties and Conventions signed will be analyzed and identified within the Framework Program to promote and/or facilitate the accomplishments of these transboundary actions. The outcome will provide opportunities to mobilize financing for sustainable development of clean technologies and practices within the context of recreational and ecotourism development in the Lower Uruguay River. The results will be used to formulate projects promoting clean technologies and practices that capture CO<sub>2</sub> in order to reduce the greenhouse effect and mitigate climate change. Recreational development and ecotourism projects will be implemented in the Lower Uruguay River with the involvement of a public-private partnership.

Work Element	Output	Outcome
II.6.1 Clean technologies identified	I.6.1 Priority Activity: Clean-technologies to mitigate climate change	Activities using clean technologies and greenhouse sinks are identified and formulated by the end of the project
II.6.2 Nautical Ecotourism Project	II.6.2 Priority Activity: Nautical Ecotourism in the Lower Uruguay River/Parana Delta	Activities promoting sustainable tourism within appropriate cultural and historic venues to be included in the SAP.

Work Element	Sources of funding				Total Cost (US\$)
	GEF Funding (US\$)		Co-financing (#) (US\$)		
II.6.1 Clean technologies identified	\$70.000	12%	\$166.800	29%	\$236.800
II.6.2 Nautical Ecotourism Project	\$180.000	31%	\$155.000	28%	\$335.000
<b>TOTAL</b>	<b>\$250.000</b>	<b>43%</b>	<b>\$321.800</b>	<b>57%</b>	<b>\$571.800</b>

## **Part 2: Project design**

### 2.1 Background and context:

Background and introduction The subcomponent will identify the clean technologies that promote activities such as navigation, responsible and sustainable tourism and the potential of the so-called Clean Development Mechanisms (CDM) proposed by the Kyoto Protocol (KP) of the United Nations Framework Convention on Climate Change (UNFCCC.) The UNFCCC, signed in the context of the United Nations (UN) at the Summit held in Rio de Janeiro (1992), seeks to limit the emission of greenhouse gases (GHGs) in order to stabilize the global climate. Accordingly, the goal of this subcomponent is to initiate an effort aimed at identifying and implementing activities that will translate into opportunities for sustainable development in the basin, encouraging public-private partnerships and the involvement of small towns and producers. The outcome will generate opportunities to mobilize financing for the sustainable development of clean technologies and practices within the context of and recreational and ecotourism development in the Lower Uruguay River. The activities identified with potential to reduce greenhouse gas emissions in the countries of the La Plata Basin include: generation of alternative energies such as electric through microturbines and wind turbines; projects using solid waste recovery as a gas filler (capturing methane) and gas extraction filling (biogas); projects to reduce GHG emissions by capturing HFC 23 residues and agro-forestal projects (carbon sequestration);

Statement of Issues Climate change is a critical and emerging issue. This diagnostic is required in order to better assess the causes and effects of climate change within the transboundary environmental context, and to design strategies and identify measures best suited to address such changes (Component III.1). As an essential element of development in the Basin, it is necessary to incorporate opportunities for sustainable development, adaptation and mitigation in the face of the advance and adverse effects of climate change. In this context, development opportunities will incorporate an environmental dimension, together with the private sector, for economically profitable activities that protect the environment

2.2 Sub-component objective The objective of this subcomponent is to promote clean technology activities in sectors such as navigation and responsible and sustainable tourism. This subcomponent concentrates on the identification and preparation of activities and the mobilization of financing for inclusion of sustainable development principles in the following two activity areas: (1) projects that promote a regional strategy to reduce greenhouse gases and mitigate climate change by way of clean technologies and carbon capture, and 2) projects that promote ecotourism and navigation among the islands, coastal waters and wetlands of the Uruguay River, validating cultural and historical resources through the utilization of equipment constructed in the Lower Uruguay River. Existing treaties and Conventions signed will be analyzed and identified within the Framework Program to promote and/or facilitate the accomplishment of these transboundary actions.

2.3 Environmental benefits An action plan with a regional approach for identified sustainable development opportunities, focusing on the dimension of activities that protect the environment, are economically profitable, and can be sustainably maintained. Transboundary issues will be addressed in a regional manner so as to yield global benefits. The environmental benefit can be maximized by developing focused pilot interventions in multi-national areas, which can be replicated at the basin level in conformity with regional guidelines and agreements. The abundant supply of natural and cultural resources across borders offers opportunities for various stakeholders, including the private sector, to engage in environmentally sustainable development. Further, an added benefit is the ability to extrapolate experiences locally at scales of greater impact for the Basin.

2.4 Overall subcomponent outcomes Development of opportunities to mobilize financing for sustainable development of clean technologies and practices within the context of and recreational and ecotourism development in the Lower Uruguay River. These opportunities for sustainable development could include the following activity areas: clean technologies and practices which promote the search for national financing for CO<sub>2</sub> in order to reduce greenhouse gases to mitigate climate change, and recreational development and ecotourism projects to be implemented in the Lower Uruguay River.

2.5. Consistency of the sub-project with national/regional priorities and plans The Kyoto Protocol (KP) of the United Nations Framework Convention on Climate Change signed in the context of the United Nations (UN) at the Summit held in Rio de Janeiro (1992) has been implemented at the national level, through coordinated action by the relevant agencies in the field at the regional level. MERCOSUR is also acting upon this issue and progress made will be considered in the present activity.

2.6 Coordination and linkages to the umbrella project activities and other related activities in the basin The current Subcomponent is an important aspect of the IWRM of the Basin as it involves the execution of actions related to sustainable development opportunities. It assures the linkages to the umbrella Component II and is intrinsically connected to the development of the TDA and SAP.

### 2.7 Incremental reasoning:

Baseline Each country develops projects on a national level to advance clean technologies and practices that capture CO<sub>2</sub>'s in order to reduce the greenhouse effect and mitigate climate change. There is no coordination at the regional level. The countries work in an isolated manner.

Increment The project contributes to a higher objective set forth by the five signatory countries to the La Plata Basin Treaty--Argentina, Bolivia, Brazil, Paraguay and Uruguay--as coordination of actions and investment in the La Plata Basin for the sustainable management of its water resources, in particular those related to sustainable development opportunities. The increments will be: assembling, analyzing, and synthesizing the country-level information and actions into and agreed regional level using a common framework.

Incremental reasoning GEF support in this subcomponent implies the commitment of the five countries of the La Plata Basin to work together in a coordinated manner. Taking a regional approach to the action plan for develop sustainable opportunities has been shown to be a much more effective approach when compared to similar actions undertaken at the individual or national basin level. There is a collective and global benefit to promote and address clean technologies at the basin level.

### 2.8 Working Element – Outputs – Outcome:

Subcomponent Objective and Outcomes	Description of Output indicator	Baseline level	Mid-term target	End-of-project target
Opportunities made available to mobilize financing for sustainable development of clean technologies for the LPB, and to protect natural and cultural heritage within the context of recreational and ecotourism development actions in the Lower Uruguay River and Parana Delta.	Clean-Technologies inventory	National offices of CDM promoting clean technologies and related projects.	-100% completed inventory. - 5 projects for strategic actions selected	<b>- Clean technologies are scaled up and principles included in the SAP -</b> - 5 projects for strategic actions selected and included in the SAP.
	Training			
	Nautical Ecotourism project document proposal structured and evaluated	National studies about nautical activities and equipment in Ur. and Ar.	Feasibility study 100% complete, 4 areas with management plans, and 2 binational touristic nautical routes or circuits agreed upon, and operated by private sector.	Proposal included in the SAP for bringing the experience to scale.

Subcomponent Objective and Outcomes	Description of Output indicator	Baseline level	Mid-term target	End-of-project target
II.6.1 Activities using clean technologies and greenhouse sinks are identified and formulated by the end of the project	Projects selected in the regional framework and promotes the search for funding at the national level	Not in existence	50%	100%
II.6.2 Activities promoting sustainable tourism within appropriate cultural and historic venues	Nautical Ecotourism project document proposal structured and evaluated	Not in existence	100% complete	

### II.6.1. Proposal of projects that promote clean technologies and the carbon capturing in order to reduce greenhouse gases and mitigate climate change

Objective: Creation of projects that promote clean technologies and carbon capturing in order to reduce greenhouse gases within the framework of creating opportunities for sustainable development, adaptation and mitigation to the adverse effects of climate change.

Outputs: Proposals for projects that identify opportunities for sustainable development in the context of a regional strategy for carbon sequestration to reduce the greenhouse effect and improve environmental protection.

Outcomes: Activities using clean technologies and greenhouse sinks are identified and formulated by the end of the project

**Output II.6.1** Priority Activity: Clean-technologies to mitigate climate change

- a) Explore opportunities for clean-technologies to capture greenhouse gases in the basin
- b) Select areas for mutual cooperation and secure financing

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output II.6.1 Priority Activity: Clean-technologies to mitigate climate change	<p><b>- Clean Technologies inventory, for project identification and promotion.</b></p> <p>- Municipalities, NGO's and/or small farmer org's from the 5 riparian countries trained. Strategic actions and projects using clean technologies and greenhouse sinks identified and prepared.</p>	National offices of CDM promoting clean technologies and related projects	<p>-100% inventory and training completed by the end of the 1<sup>st</sup> trimester of year 2.</p> <p>- 5 project proposals developed by the 3rd trimester of the 2<sup>nd</sup> year as demo for solid waste disposal and CO2 sequestration, using clean technologies and greenhouse sinks..</p>	<p>- Clean technologies are scaled up and principles included in the SAP -.</p> <p>- 5 projects for strategic actions selected and included in the SAP.</p>
a) Explore opportunities for clean-technologies to capture greenhouse gases in the basi				
<p>▪ Identify practices related to sustainable development opportunities that include Clean Development Mechanism</p>		<p>Agreements with the National Offices for CDM in each riparian country, by the end of the 1st</p>		

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
	(CDM). Maximizing and improving the effectiveness of activities through a plan to exploit opportunities, using informational materials and organizing events for promotion and training at the nation level.		semester.	
	<ul style="list-style-type: none"> <li>▪ The courses will be targeted at both the public and private sectors that are capable of using this kind of technology to the benefit by; on the one hand reducing emission levels of greenhouse gases (GHGs) and on the other hand by obtaining financial advantages for the future. The strategy is directed with a preference for identifying projects for solid waste disposal, the use of alternative energy and agro-forestry projects. This distribution provides training and support in developing such projects. The initiative will be directed to productive sectors and municipalities that have not had access, until now, to this type of technology.</li> <li>▪ Work at the national level with the governmental institutions responsible for this theme</li> </ul>		<ul style="list-style-type: none"> <li>Identification of sectors interested in using these instruments by the end of the 1st semester.</li> <li>Promotion and training, in agreement with the national government institutions in the use of CDM, by the end of the 1<sup>st</sup> trimester of year 2.</li> <li>.</li> <li>Demonstration project identified and prepared with stakeholders by the end of the 3<sup>rd</sup> trimester of the year 2.</li> <li>Proposal to upscale the experience in the SAP by the end of the project.</li> </ul>	
b) Select areas for mutual cooperation and secure financing				
	The proposals presented will be evaluated by the national institutions through the use of a selection committee and will promote their quest for funding.		Project proposals selected and promotion for funding sought at the national level, by the end of the 3 <sup>rd</sup> trimester of the year 2.	

#### II.6.2. Proposal of Nautical Ecotourism Project in the Lower Uruguay River and Paraná Delta (Argentina-Uruguay).

*Objective:* To prepare a specific project as a public-private partnership to promote nautical tourism in the lower Uruguay River and the Paraná Delta area, as an important opportunity to protect and promote the sustainable use of the natural and cultural resources of the Uruguay River in Argentina and Uruguay.

*Outcomes:* Strengthening protected areas as spaces for economically viable and environmentally sustainable opportunities.

*Output II.6.2 Priority Activity:* Nautical Ecotourism in the Lower Uruguay River/Parana Delta

*Activities:*

- a) Study the socio-economics aspects of nautical/cultural tourism
- b) Study the environmental aspects of nautical/cultural tourism
- c) Assess the opportunities and investment potential
- d) Develop proposals for eco-cultural nautical tourism
- e) Implement and prepare implementation and financial framework to replicate priority activity

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Nautical Ecotourism in the Lower Uruguay River/Parana Delta	<ul style="list-style-type: none"> <li>- Nautical Ecotourism project document proposal structured and evaluated.</li> <li>- Private companies and nautical clubs from Ar. and Ur. co-finance the protection of cultural and natural heritage by developing nautical eco-tourism.</li> </ul>	National studies about nautical activities and equipment in Ur. And Ar.	<ul style="list-style-type: none"> <li>- A public-private project prepared and feasibility studies for nautical eco-tourism completed by the end of the 1st year.</li> <li>- Binational agreements between Ar.-Ur, to facilitate access and immigration controls in protected areas accessible by boat at the end of year 1.</li> <li>-4 management plans to protect selected natural and cultural heritage at the end of the 1<sup>st</sup> year.</li> <li>- 2 binational nautical routes or circuits agreed upon,</li> </ul>	- Proposal in the SAP for bringing the experience to scale by the end of the Project.

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
			operated by private companies or clubs, at the 2nd year. 4 protected areas included. - Private investments for the sustainable use of the cultural and natural heritages by the 3 <sup>rd</sup> year.	
a) Study the socio-economics aspects of nautical/cultural tourism				
<p>Data collection and assessment of:</p> <ul style="list-style-type: none"> <li>i) the natural and cultural resources accessible by the Uruguay and Plata rivers and the Paraná Delta, identifying the legal status of the tourist attractions and the related areas to be included as part of tourist routes;</li> <li>ii) the existing services and the logistical needs to facilitate access and lodging in the areas; the existing routes and organizations working in related activities. This study will identify the legal status of the main attractions and the existing facilities to develop local activities and the interest of the local communities to promote and develop tourism based in these resources, with the identification of a need for capacity building and adequate development of the areas affected.</li> <li>iii) In addition, an analysis of the sustainable capacity of the resources will be conducted so as to establish the natural resilience to tourism activities and possible environmental impacts, proposing draft terms of reference to develop Management Plans needed to protect biological, natural, and landscaping value.</li> <li>iv) This activity will guide the Technical Unit of the FSAP in the identification of key partners in the private sector for possible involvement in Project activities, with the inclusion of a broad spectrum of companies, nautical clubs and tourism companies in both countries and upstream of the Uruguay River, including the Paraná delta and Colonia del Sacramento areas.</li> </ul>			<p>Studies on the demand for tourism (specifically nautical activities) in natural and cultural heritage sites in the lower Uruguay River and Paraná Delta, by the end of year 1. Final report and support materials, including a proposal for the development of ecotourism and cultural offerings, the identification of the legal status, and an assessment of the interest of local communities in the development of such activity, by the end of year 1. The activity will also result in 4 terms of reference to develop specific management plans for the sustainable use of each of these areas of natural or cultural interest identified, and included as part of the proposal.</p>	
<ul style="list-style-type: none"> <li>▪ The study will be developed by two consultants (one for each country), in close relation with the private sector and the tourism authorities of both countries. The objective is to define the characteristics of the different groups of interest and to quantify the possible tourism-related travels from both sides of the Uruguay River. A particular international study will be developed to ascertain the possibility of linking the proposed nautical tourism with the international birdwatching tourism, seeking to develop this kind of tourism in the area.</li> </ul>			<p>A complete report of the potential demand for the nautical ecotourism with the identification of different segments of interest, by the end of year 1.</p>	
b) Study the environmental aspects of nautical/cultural tourism				
<ul style="list-style-type: none"> <li>▪ This activity, to be developed in close coordination with the private sector of both countries, will seek to establish and describe the available infrastructure and equipment for nautical activities in the lower Uruguay River, the Paraná Delta and the area of influence. The study will cover the groups of interest and include a specific research on the main driving forces and restrictions that can orient the proposed development. This activity will be complemented with an assessment of the sources of water pollution and landscape degradation that affects the tourist offer at the local level, and the identification of possible solutions involving local authorities and communities' organizations.</li> </ul>			<p>Report describing the location and quantification of the infrastructure and equipment for nautical activities and related services in the region, and the interest and behavior of the different segments of this sector by the end of year 1..</p>	

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<ul style="list-style-type: none"> <li>▪ This activity, to be developed in close coordination with the private sector of both countries, will seek to establish and describe the available infrastructure and equipment for nautical activities in the lower Uruguay River, the Paraná Delta and the area of influence. The study will cover the groups of interest and include a specific research on the main driving forces and restrictions that can orient the proposed development. This activity will be complemented with an assessment of the sources of water pollution and landscape degradation that affects the tourist offer at the local level, and the identification of possible solutions involving local authorities and communities' organizations.</li> </ul>			Report describing the location and quantification of the infrastructure and equipment for nautical activities and related services in the region, and the interest and behavior of the different segments of this sector by the end of year 1..	
<b>c) Assess the opportunities and investment potential</b>				
<ul style="list-style-type: none"> <li>▪ This activity, to be developed in close coordination with the private sector of both countries, will seek to establish and describe the available infrastructure and equipment for nautical activities in the lower Uruguay River, the Paraná Delta and the area of influence. The study will cover the groups of interest and include a specific research on the main driving forces and restrictions that can orient the proposed development. This activity will be complemented with an assessment of the sources of water pollution and landscape degradation that affects the tourist offer at the local level, and the identification of possible solutions involving local authorities and communities' organizations.</li> </ul>			Report describing the location and quantification of the infrastructure and equipment for nautical activities and related services in the region, and the interest and behavior of the different segments of this sector.	
<b>d) Develop proposals for eco-cultural nautical tourism</b>				
<p>This activity will be conducted by the Technical Coordinator of the FSAP with the help of:</p> <ul style="list-style-type: none"> <li>▪ i) an assistant lawyer, to develop the partnership with the different key actors involved and the private sector, and to propose the needed activities to be carried out to resolve legal aspects related to the proposed development and prepare and finalize the different agreements needed;</li> <li>▪ ii) a social assistant to organize the local communities, to help the process of public participation and community involvement;</li> <li>▪ iii) a publicist or communication expert, to design an advertising campaign and dissemination tools, and</li> <li>▪ iv) a project economist specialized in environmental projects, to integrate and evaluate in economic, financial and environmental terms the base line of this project and the proposal, and include economic mechanisms to assure the capacity to transfer funds for the protection of the natural resources and ecosystems involved. This specialist will also be responsible for preparing the M&amp;E Plan for the execution of this Priority Project.</li> <li>▪ In addition, the project will prepare a publication describing the activities, arrangements, and benefits of the project, so as to promote and disseminate the activity internationally. The project will include a budget for the promotion of the project in international markets and conventions.</li> </ul>			Three kinds of agreements signed to assure the public-private partnership. Different local organizations to be strengthened based on the identification and analysis of communication and technical capacity building needs. The project document proposal structured and evaluated in economic, financial and environmental terms, including economic mechanisms to protect the natural resources involved. A dissemination plan to promote the activity. A publication prepared and disseminated describing the activities, arrangements, and benefits of the project, to be used to highlight the project in international meetings. This group of activities should be finished by the end of the 2 <sup>nd</sup> trimester of year 2.	
<b>e) Implement and prepare implementation and financial framework to replicate priority activity</b>				
<ul style="list-style-type: none"> <li>▪ This activity will be the result of the proposed developments and will be conducted in close consultation with the private sector involved in the projects and the local communities. The different specific pre-designs and the identification of investments needed and the financial arrangements with the private sector will be the main results of this activity.</li> </ul>			An investment plan and financial arrangements, with a description of the different steps to be developed, by the end of the 2 <sup>nd</sup> . trimestr of year 2..	



Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
<p>This activity will be conducted by the Technical Coordinator with the help of:</p> <ul style="list-style-type: none"> <li>▪ an assistant lawyer, to develop the partnership with the different key actors involved and the private sector, and to propose the needed activities to be carried out to resolve legal aspects related to the proposed development and prepare and finalize the different agreements needed;</li> <li>▪ ii) a social assistant to organize the local communities, to help the process of public participation and community involvement;</li> <li>▪ iii) a publicist or communication expert, to design an advertising campaign and dissemination tools, and</li> <li>▪ iv) a project economist, specialized in environmental projects, to integrate and evaluate in economic, financial and environmental terms the base line of this project and the proposal, and include economic mechanisms to assure the capacity to transfer funds for the protection of the natural resources and ecosystems involved. This specialist will also be responsible for preparing the M&amp;E Plan for the execution of this Priority Project.</li> <li>▪ In addition, the project will prepare a publication describing the activities, arrangements, and benefits of the project, so as to promote and disseminate the activity internationally. The project will include a budget for the promotion of the project in international markets and conventions.</li> </ul>			<p>Three kinds of agreements signed to assure the public-private partnership. Different local organizations to be strengthened based on the identification and analysis of communication and technical capacity building needs. The project document proposal structured and evaluated in economic, financial and environmental terms, including economic mechanisms to protect the natural resources involved. A dissemination plan to promote the activity. A publication prepared and disseminated describing the activities, arrangements, and benefits of the project, to be used to highlight the project in international meetings, by the end of the 2<sup>nd</sup>. trimestr of year 2..</p> <p>Follou-up activities to upscaling the experience in the SAP, by the end of the Project.</p>	

## 2.9. Budget:

### GEF Budget

Concept	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200 Consultants	\$127,360	\$45,000	\$9,640	\$0	\$0	\$182,000
3200 Workshops and Training	\$40,000	\$13,000	\$0	\$0	\$0	\$53,000
4100 Equipment and Supplies	\$5,000	\$5,000	\$5,000	\$0	\$0	\$15,000
<b>Total</b>	<b>\$172.360</b>	<b>\$63,000</b>	<b>\$14.640</b>	<b>\$0</b>	<b>\$0</b>	<b>\$250,000</b>

### Consultants to be hired for the project

Consultants Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
Local Technical Assistance			
Opportunities: Consultant 1	750	40	Preparation of dissemination and training in the MDL. Developing the groundwork for the so-called stakeholders of developing projects.
Opportunities: Consultant 2	750	31	Review of the existent cultural and natural offers of interest for the tourist sector.
Opportunities: Consultant 3	750	18	Survey of the existing infrastructure and nautical equipment in Argentina and Uruguay for recreational navigation in the Lower Uruguay River.

<b>Consultants Position Titles</b>	<b>\$/ person week</b>	<b>Estimated person weeks</b>	<b>Tasks to be performed</b>
Opportunities: Consultant 4	750	10	Environmental assessment and preparation of the plans for the proposed initiatives.
Opportunities: Consultant 5	750	20	Estimation of the demand for tourism in the lower Uruguay River in Argentina and Uruguay linked to cultural and natural themes.
Opportunities: Consultant 6	750	10	Definition of a birdwatching strategy.
Opportunities: Consultant 7	750	15	Define routes for nautical tourism in the Lower Uruguay River and its relationship to the La Plata River and the Parana River.
Opportunities: Consultant 8	750	90	Define infrastructure and nautical sports equipment needs. Preliminary designs for project engineering and architecture.
Opportunities: Consultant 9	750	14	Legal Advice regarding the proposals.
Opportunities: Consultant 10	750	10	Advice for social participation in the projects.
Opportunities: Consultant 11	750	6	Advice concerning the dissemination of the projects.
Opportunities: Consultant 12	750	22	Advice on environmental aspects and their relationship with the economic and financial evaluations of the projects.

**2.10 Timetable:** A summary timetable should be presented in the text and a detailed one should be put in Annex 3 as appropriate.

Working Elements	Activities	Timeline of Activities																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>II.6.1 Proposal of projects that promote clean technologies and the capture of greenhouse gases</b>																					
1 Development of Proposals																					
2 Selection of the proposals and seeking financing																					
<b>II.6.2 Proposal of Nautical Ecotourism Project</b>																					
1 Study of the ecotourism and cultural tourism offer																					
2 Study of the nautical tourism offer and the Environmental quality																					
3 Study of the potential tourism demand																					
4 Development of proposals for nautical routes and circuits for eco and cultural tourism																					
5 Study of required investments																					
6 Arrangements for the Execution and the Replication of the Project.																					

### 2.11 Cost effectiveness:

The joint analysis of the five countries effectively addresses the issue of regional asymmetries, the developmental benefits of integration, and leveling of skills with lower costs. . Technical and economic

benefits will be maximized due to the synergy achieved through joint action at the local and basin level, particularly regarding the regional GEF projects.

### 2.12 Risk Analysis

<b>Risk</b>	<b>Rating (L/M/H)</b>	<b>Risk Mitigation Measures</b>
Private sector are not involved in the project	M	Key institutions and private sector are involved in the design of the priority project
Local stakeholders display low willingness to participate	L	Promote information on the expected outputs and outcomes of the Project and motivate involvement by executing projects along with civil society.

**2.13 Sustainability:** Project activities and implementation are designed (including the public involvement and stakeholder participation processes) to achieve sustainability. All of the activities form the foundation of a multi-sector, multi-institutional, and basin-wide arrangements for the implementation of the monitoring system. The project will be carried out by relevant government agencies with the public sector, and will strengthen the existing institutional and human capacities. The networks will be integrated at an agreed upon regional level using a common framework, which maintains national responsibility for executing the action plan established for this stage.

**2.14 Replicability:** The results of the Project will be disseminated through governmental institutions, nongovernmental organizations, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including related institutions in each of the five countries, will permit the development of information transfer mechanisms to share new knowledge and provide for active coordination and horizontal cooperation in the integrated management of the water resources of the Basin. The pilot project deals intimately with the private sector and the insights obtained will be easily adopted at the regional level through the disseminated process.

All of the proposed activities are multifaceted and include a strong multi-stakeholder participation element which will contribute to the “buy-in” of the project constituencies. Thus, the prospects for replicating such activities are high and can be achieved with minimal effort by exchanging relevant information and lessons learned.

**2.15 Execution arrangement:** National environmental ministries, social and production organizations, ministries of tourism and marine transportation, international tourism agencies and civil organizations.

**2.16 Public participation mechanisms** The participative dimension strengthens Basin governance, and is present in each of the activities to be executed during the project. Promoting public participation in this project is integral and present throughout the process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society — with a special focus on gender equity and indigenous peoples. This involvement will also favor appropriations and the social sustainability of the action plan during both its formulation and implementation, including the consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

**2.17 M&E** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

## PROCESS OUTCOMES AND INDICATORS

Process OUTCOMES			Process INDICATORS
Multi-country agreement on transboundary priority concern, impact and cause			<ul style="list-style-type: none"> <li>- Identification and formulation of projects using clean technologies and greenhouse sinks by the end of the project.</li> <li>- Identification and formulation of projects on sustainable tourism: identification of cultural and historic itineraries and promotional activities carried out by the end of the project.</li> </ul>
Multi-country agreement on governance reforms and investment to address priority transboundary concern			<ul style="list-style-type: none"> <li>- Creation of a working group at the CIC level related to these opportunities.</li> <li>- Reports and minutes of meetings.</li> </ul>
Effective national Inter-ministry Coordination			<ul style="list-style-type: none"> <li>- Inter-ministerial mechanism at the national level established reach an agreement on the implementation of the Subcomponent.</li> <li>- Interministerial agreement by the agencies involved in the issue in each country to establish a representative for the CIC group regarding Opportunities.</li> <li>- Reports and minutes of meetings of the national groups.</li> </ul>
Stakeholder involvement			<ul style="list-style-type: none"> <li>- Increase awareness of and participation in the project activities through workshops and meetings with local authorities, institutions, and stakeholders.</li> <li>- Preparation and wide dissemination of project-related documentation and project-related activities through the fund for civil society</li> </ul>
Multi-country waterbody legal framework adopted and/or strengthened			<ul style="list-style-type: none"> <li>- Proposal for a legal framework agreed to through the CIC</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions			<ul style="list-style-type: none"> <li>- cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>- Institutional strengthening (training and equipment) provided to institutions related to the project.</li> </ul>

## ANNEXES

## Annex 1: Terms of Reference for Consultants

**Consultant 1****Objective:**

Identify the mechanisms of clean development

**Activities:**

Jointly with the relevant national institutions, define a course of dissemination and training to establish: a) the composition of the MDL; b) the benefits generated for the participants, c) who may participate in projects of this nature.

Plan training courses in 5 countries.

Define the sectors interested in participating in MDL projects.

**Results:**

Promotion and training, collaboratively with the national governmental institutions, employed in the mechanisms of clean development.

Identification of the sectors interested in participating in the use of this instrument.

**Duration:**

The duration for this task will be 12 months

**Consultant 2****Objective:**

Survey of existing cultural and natural resources of interest for tourism.

**Activities:**

Data collection and assessment of: i) the natural and cultural resources accessible by the Uruguay and La Plata rivers and the Paraná Delta, identifying the legal status of the tourist attractions and the related areas to be included as part of tourist routes; ii) the existing services and the logistical needs to facilitate the access and lodging in the areas; the existing routes and organizations working in related activities. This study will identify the legal status of the main attractions and the existing facilities to develop local activities and the interest of the local communities to promote and develop tourism based in these resources, with the identification of need for capacity building and adequate development of the areas affected. In addition, an analysis of the sustainable capacity of the resources will be conducted so as to establish the natural resilience to tourism activities and possible environmental impacts, proposing draft terms of reference to develop Management Plans needed to protect the biological, natural, and landscaping values. This activity will guide the Technical Unit of the FSAP in the identification of key partners in the private sector for possible involvement in Project activities, with the inclusion of a broad spectrum of companies, nautical clubs and tourism companies in both countries and upstream the Uruguay River, including the Paraná delta and Colonia del Sacramento areas.

**Results:**

Final report and support materials, including the proposal for the development of the ecotourism and cultural offer, the identification of the legal status, and an assessment of the interest of local communities in the development of this activity. The activity will also result in a number of terms of reference to develop specific management plans for the sustainable use of each of the areas of natural or cultural interest identified and included as part of the proposal

**Duration::**

The duration for this task will be 9 months.

**Consultant 3****Objective:**

Survey of existing infrastructure and nautical equipment in Argentina and Uruguay for nautical activities in the lower Uruguay River.

**Activities:**

This activity, to be developed in close coordination with the private sector of both countries, will seek to establish and describe the available infrastructure and equipment for nautical activities in the lower Uruguay River, the Paraná Delta and its area of influence. The study will cover the groups interested and include

specific research on the main driving forces and restrictions that can orient the proposed development.

**Results:**

Report describing the location and quantification of the infrastructure and equipment for nautical activities and related services in the region, and the interest and behaviour of the different segments of this sector.

**Duration**

The duration for this task will be 3 months.

**Consultant 4**

**Objective:**

Environmental assessment and preparation of plans for the initiatives proposed.

**Activities:**

This Consultant completes the task of Consultant 3.

This activity will be complemented with an assessment of the sources of water pollution and landscape degradation that affects the opportunity for tourism at the local level, and the identification of possible solution involving local authorities and community organizations.

**Results:**

Report describing the location and quantification of the possible sources of contamination, and obtaining solutions to be applied/

**Duration::**

The duration for this task will be 3 months.

**Consultant 5**

**Objective:**

Estimation of the demand for tourism in the lower Uruguay River in Argentina and Uruguay linked to cultural and natural themes.

**Activities:**

The study will be developed by two consultants (one for each country), in close relation with the private sector and the tourism authorities of both countries. The objective is to define the characteristics of the different groups of interest and to quantify the possible tourism-related travel from both sides of the Uruguay river. A particular international study will be developed to ascertain the possibility of linking the proposed nautical tourism with the international travels of bird watching tourists, seeking to develop this kind of tourism in the area.

**Results:**

A complete report of the potential demand for the nautical ecotourism with the identification of different segments of interest.

**Duration::**

The duration for this task will be 3 months.

**Consultant 6**

**Objective:**

Create a strategy for birdwatching of native birds.

**Activities:**

Defining actions to be taken

**Results:**

Work plan

**Duration::**

The duration for this task will be 3 months.

**Consultant 7**

**Objective:**

Establish nautical tourism routes in the lower Rio Uruguay and their relationship to the La Plata and the Parana Rivers.

**Activities:**

This activity will be developed in close coordination with the national institutions responsible for navigation in the Uruguay River and the Paraná Delta, and the participation of the private sector. The activity will analyze the characteristics of the river and alternative navigation routes to access the resources identified. A proposal for alternative routes to access the environmental and cultural resources will be developed, identifying the main restrictions and considerations, and including costs of the different nautical routes. This activity will be complemented with the identification of key private companies or organizations with which to establish memorandums of understanding (MOU) for partnerships.

**Results:**

Report, including nautical maps for the proposed routes and circuits for the development of eco and cultural tourism, and a list of key possible private partners to negotiate MOU

**Duration::**

The duration for this task will be 3 months.

**Consultant 8****Objective:**

Define infrastructure equipment needs for nautical activities. Pre-designs for engineering and architectural Projects.

**Activities:**

This activity will be the result of the proposed developments and will be conducted in close consultation with the private sector involved in the projects and the local communities. The different specific pre-designs and the identification of investments needed and the financial arrangements with the private sector will be the main results of this activity.

**Results:**

An investment plan and financial arrangements, with a description of the different steps to be developed.

**Duration::**

The duration for this task will be 12 months.

**Consultant 9****Objective:**

Legal assessment of the proposals

**Activities:**

Assistant lawyer, to develop the partnership with the different key actors involved and the private sector, and to propose the needed activities to be carried out to resolve legal aspects related to the proposed development and prepare and finalize the different agreements needed;

**Results:**

Legal resources for the development of the initiatives.

**Duration**

The duration for this task will be 24 months, non-continuous.

**Consultant 10****Objective:**

Assessment of social participation in the projects

**Activities:**

Social assistant to organize the local communities, to help the process of public participation and community involvement;

**Results:**

Involvement of society in support of the projects to be executed.

**Duration::**

The duration for this task will be 24 months, non-continuous.

**Consultant 11**

**Objective:**

Assessment of the dissemination of information regarding the projects

**Activities:**

A publicist or communications expert, to design an advertising campaign and dissemination tools, to spread the word about the benefits of the projects.

**Results:**

Involvement of society in support of the projects to be executed. Execution of the projects with proper information.

**Duration:**

The duration for this task will be 24 months, non-continuous.

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**Consultant 12**

**Objective:**

Assessment of the environmental aspects and their relationship with the economic and financial evaluation of the projects.

**Activities:**

Analyse the environmental projects, to integrate and evaluate in economic, financial and environmental terms the base line of the project and the proposal, and include economic mechanisms to assure the capacity to transfer funds for the protection of the natural resources and ecosystems involved. This specialist will also be responsible for preparing the M&E Plan for the execution of this Priority Project.

**Results:**

Projects environmentally and economically analysed. Creation of a Monitoring and Evaluation Plan for the projects that are executed.

**Duration:**

The duration for this task will be 24 months, non-continuous.



### Annex 3: Details of the Priority Project

PROJECT TITLE:

NAUTICAL ECOTOURISM IN THE LOWER URUGUAY RIVER AND PARANÁ DELTA (Argentina-Uruguay).

EXECUTING AGENCIES:

PUBLIC-PRIVATE PARTNERSHIP UNDER THE LEADERSHIP OF THE CIC IN AGREEMENT WITH CARU AND WITH THE PARTICIPATION OF THE ARGENTINE UNDERSECRETARIAT OF WATER RESOURCES, THE NATIONAL DIRECTORATE OF HYDROGRAPHY OF URUGUAY, THE MINISTRY OF TOURISM OF URUGUAY AND THE SECRETARIAT OF TOURISM OF ARGENTINA AND, THE ENVIRONMENTAL AUTHORITIES IN BOTH COUNTRIES.

DURATION:

22 MONTHS

### PROJECT SUMMARY

#### Background

The Uruguay River is one of the three main rivers of La Plata River system; rises in the hills of Southern Brazil and is over 1,100 miles (1,838 km) long, with a basin of 370,000 km<sup>2</sup> in which lived about 7 million inhabitants. The river flows in an arc West, South-West, and South. At the point in which it receives from the right side the Cuareim/Quaraí River - border between Brazil and Uruguay – it becomes the border between Uruguay (left) and Argentina (right). In 1974, both countries built a hydro-electrical dam (1,890 MW) in this portion of the river, at the Salto Grande waterfalls, that generates over this place a big reservoir. At its end, the Uruguay River joins the Paraná River just in front of its impressive delta and the Northern part of the metropolitan area of Buenos Aires, in the Argentinean side. Together, the Uruguay and the Paraná rivers form the La Plata River.

The Uruguay River links, as a water and coastal corridor, the habitat of the “Mata Atlántica”, “Chaco” and Grass “Pampas” biomes in South America. Its basin includes three areas of bird endemism and the river waters and associated habitats 13 species of endemic fishes.

The Northern part of the metropolitan area of Buenos Aires is expanded over the Paraná delta with a very important number of nautical clubs, infrastructure and equipment that shows the interesting potential to expand activities over new attractions, provided by the existent natural and cultural conditions. In front of Buenos Aires is the city of Colonia del Sacramento, in the Uruguayan side. This is a relatively small city established in the XVII Century by the Portuguese, and declared a World Human Heritage by UNESCO in 1995. Colonia del Sacramento is an important tourist attraction that has developed nautical infrastructure to support tourism. Based on these two points and other existent infrastructure, and considering therefore the navigation possibilities of the Paraná Delta, upper Plata and lower Uruguay Rivers and its affluent (up to the Salto Grande dam), the opportunity to develop this project was identified. The Project is oriented to protect the water quality, coastal areas, wetlands and protected areas and the particularly important existing cultural values related. The study will look to develop the opportunities offered by these cultural and natural attractions using the rivers as waterways, and the economical activity as one mechanism to finance the protection and sustainable management of the natural and cultural resources linked to it.

In 1961, the Governments of Argentina and Uruguay signed the Uruguay River Border Treaty, and in 1975 the Uruguay River Statute created the Administrative Commission for the Uruguay River, named CARU, a bi-national organization located at the head of the Gral. Artigas binational bridge- linking the cities of Colón, Argentina, and Paysandú, Uruguay - to administrate the bi-national portion (Ar-Ur), of the Uruguay River. In August 2002, based in the research and monitoring experience in the lower Uruguay River, CARU signed an agreement with the local governments of the riverside municipalities to develop the “*Environmental Plan for the Protection of the Uruguay River*”. This Plan covers the following seven thematic areas of action: Coastal Contamination; Fishery Resources; Tourism and Recreation; Coastal Areas Deterioration; Ecological Corridor; Institutional Strengthening; and Environmental Information. The proposed Priority Project to be developed looks to joint effort between the CIC in the broader space of the La Plata Basin, and CARU in the Uruguay River, to support the main objectives of this Plan agree with the local actors in the framework of CARU.

The following picture shows the lower Uruguay River and the Paraná Delta at the place that the La Plata River is formed.



### **Project rationale**

This proposed project study seeks to introduce the private sector, organized in nautical clubs and eco-turistic companies and organizations, into a sustainable development initiative based on the tourism sector, under environmental rules and objectives. This will allow for a better accessibility to the natural and cultural resources existing in the lower Uruguay River and the Paraná Delta.

CIC and CARU commissions, under agreement with key national institutional partners and the private sector, will lead the preparation of this priority project, helping to develop the nautical eco and cultural tourism, using the Uruguay River as a waterway to protect the natural resources and to promote sustainable development in the Uruguay River and Paraná Delta.

CARU, in agreement with the riverside municipalities agreed to protect the environment of the Uruguay River, with focus in water quality conservation and the protection of the services and goods offered by this water and coastal corridor that links three of the most important biomes of South America. The Uruguay corridor includes 19 species of endemic plants, 17 species of endemic invertebrates, and 13 species of endemic fishes, with more than 18 species of mammals and 44 species of birds included in the Red List of UICN<sup>1</sup>

The lower Uruguay river is wide and particularly attractive, characterized for a big chain of more than 140 beautiful islands, large coasts that combine stoned cliffs, sandy beaches, rich wetlands and forested lands. One of the most important natural attractions of the Uruguay River basin is the richness of species of birds that gave the name to the river. In fact, "Uruguay" in Guaraní language, means "river of the depicted birds", reflecting the particular interest for "birds' watchers", an important specialized tourism activity in the world. The expected interchange between tourists and the local communities, will constitute a key educational factor on the value of this resources and their habitats. The local communities, on both sides of the river, the islands, and the Paraná Delta, living in permanent contact with the richness of birds, are not aware about the

<sup>1</sup> Information mentioned in a CARU/UNDP proposal for a GEF PDF B project (OP#2) page. 3, as a conclusion of an expert meeting hold in Montevideo, Uruguay in 1999.

necessity of conserving and protecting these resources. The presence of the river and small lagoons in its borders, added to the coastal forests and wetlands, are key factors to maintain this biological resource.

The Uruguay River is navigable through the harbors of Concordia, Argentina, and Salto, Uruguay, just before the Salto Grande waterfalls, today under the waters of the reservoir of Salto Grande dam. A number of small and big harbors as Salto, Paysandú, San Javier, Nuevo Berlin, Fray Bentos and Nueva Palmira, have been established on the Uruguayan side, as well as Concordia, Colón and Concepción del Uruguay on the Argentine coast. An important number of sports harbors were also built at the riverside, to facilitate the access to the more important cities and tourist areas.

CARU research identified that harbors operation and tourist activities are not taking care of the environmental protection. These are problems to be addressed to protect the water quality and biodiversity conservation in the Uruguay River and its affluent in an integrated form to control the other sources of pollution and contamination, basically the lack adequate treatment of the city's and industrial's solid waste and effluents. There is a challenge to generate the economical and social capacity to resolve these problems at the local level, developing economical sustainable activities, as the ecotourism.

During XVII, XVIII, XIX and beginning of XX centuries, meat commerce sent to Europe, the Caribe and North America ("*charque*" –salted meat-, and frozen or processed meat), was particularly active on the Uruguay River. Numerous establishments related to meat commerce were established on its coasts. Initially, these were slaughterhouses and salting houses, which were later complemented with big industrial processing, and cold storage meat plants, after refrigerated transportation started to operate. The "Frigorífico Liebig" in Colón, Argentina or the "Frigorífico Anglo" in Fray Bentos, Uruguay, arrived with their products, known for best quality, to the European markets. They mark the river, in this key stage of the industrial development of the La Plata Basin with huge industrial plants and piers. Today, these are no longer operational, and the empty infrastructure has become a high-level tourist and cultural attraction, best accessed through the river. In some cases, the urban development generated, lost their dynamics, having languished and deteriorated on the riverside. They are appealing historical towns, with similar traditional homes, shops, and churches of particular historic styles and interest, as well as typical cultural expressions from different migratory groups established in its margins.

The Uruguay River summarizes the history of the relationship between Spain and Portugal in the region formalized in the Colonia del Sacramento old town. It was the scenario of the main pro-independence movements that gave shape to Argentina and Uruguay. Leaders and national heroes from both countries had part of their history in the surrounding of the Uruguay River. In Argentina, San Martín, a national hero, lived part of his childhood, at the ranch "Calera de las Huérfanas", located in the Department of Colonia, Uruguay. Urquiza, leader of Entre Ríos Province and a very important figure of Argentinean federalism, had his residence in the "San José" Palace, located close to the harbor city of Concepción del Uruguay, Argentina, where he kept valuable art collections. Artigas, Uruguayan national hero, established the first capital of the independent country of Uruguay, in Purificación, a plateau over the Uruguay River. Today, at the top of the coastal plateau, it is possible to see an impressive sculpture of his head overlooking the river. Going north, the three times besieged and destroyed city of Paysandú, reminds one of the La Plata basin historical milestones: Its heroic resistance to the final siege in 1865, involved Uruguayan, Paraguayan Argentinean and Brazilian interests. The river also had been highlighted from several navy battles between French's, English's and Portuguese's and Brazilian's forces in the region.

In addition to the natural, cultural, and historical attractions mentioned, it is necessary to consider the values of the Delta del Paraná, the national parks and protected areas that reach the riverside in both countries. The National Park of "El Palmar", close to Colón, in Argentina, or the "Anchorena" ranch in Colonia, Uruguay with their exotic forests and beautiful gardens, or the Farrapos wetland in San Javier, are attractions of particular interest. It is necessary to emphasize the presence of the thermal corridor of the Guaraní Aquifer, in the North and in both sides of the Uruguay River, not integrated to the river, but with potential for tourism development.

The project would not be justified in the absence of a market and a demand for these natural, cultural, and historical values. As the demand exists, it clearly defines the potential and opportunity to join efforts between the public and private tourist sectors of both countries with the environmental institutions and organizations working to protect the natural values. These efforts will be essential in order to preserve the coastal and

fluvial ecosystem, the wetlands, the islands, and the milestones of the culture and history of the La Plata basin, particularly those of the Uruguay River. Indeed, in the Northern part of the Buenos Aires metropolitan area placed within the Delta del Paraná there are hundred of nautical clubs and thousands of boats of different sizes. This equipment, together with the one of Carmelo and Colonia del Sacramento in front of Buenos Aires, Montevideo, and the tourist area of Punta del Este, are potentially interested to open or strengthen commercial and conservative tourist activities (natural and cultural nautical tourism). On the other side, the institutions responsible for the tourism and navigation sector of both countries, are ready to help coordinating strategic actions, improving roads, access, and mooring equipment and lodging in areas of particular interest on both riversides. Actually, the nautical tourism is mainly sport and fishing rarely going upstream of the Uruguay River, except for events as the historical “Meseta de Artigas” boat race or the “Río Uruguay” boat race.

Nevertheless, there is an antecedent, during the year 2000, an old ship was used for tourist navigation in the Uruguay River –from Buenos Aires to Concepción del Uruguay –mooring at Argentina ports and given tourist the possibility to visit historical and natural places. The experience was short but successful.

An important factor to take into account is the traditionally good relations between Uruguay and Argentina to work together. In this case, they will develop a coordinated and positive understanding to work toward sustainable development, with a public-private partnership that will benefit both countries and the local communities. The natural resources and the beautiful landscape on the Uruguay River, together with the islands, birds and wetlands, are great values of the La Plata Basin, with global importance, that needs to be protected.

### **Project Objectives**

The aim of this activity is to prepare a specific project as a public-private partnership to promote the nautical tourism in the lower Uruguay River and the Paraná Delta area, as an important opportunity to protect and promote the sustainable use of the natural and cultural resources of the Uruguay River in Argentina and Uruguay.

Based in the project, the natural resources and the ecosystems present at the Uruguay River and the Paraná delta and the cultural and historical values of the area will be strengthen and protected under the interests of this partnership and bi-national coordination. The project will also support the public participation process, and reinforce the good relations between the communities involved in both riversides, who share a similar history, as well as commercial and family links. Additional objectives linked to the La Plata Framework Program are the involvement of the riverside municipalities, local authorities and organizations to work under common objectives for local development and sanitation for the secure final treatment of the sewage and solid waste that affect water quality, human health and the urban and rural landscape.

### **Expected Project Outcomes.**

1. Three levels of agreements to prepare and to execute the project study.
  - Agreement signed between CIC, CARU, Argentina Under secretariat of Water Resources, Uruguayan National Directorate of Hydrographie and environmental and tourism institutions of both countries.
  - An important number of Letters of Understanding with the private organizations interested in participating in the preparation of the Project and the future execution, defining how they will participate.
  - The official establishment of a working group in the framework of the FSAP.
2. A public-private partnership established and formalized in a Project Document as a priority project for the La Plata Basin, including:
  - Specific studies on the natural and cultural resources accessible from the Uruguay River, defining the main routes to promote nautical eco and cultural tourism, with the Uruguay River as a waterway, identifying the particular natural and cultural characteristics, the potential uses and related legal and natural restrictions for tourism use.
  - Selected areas of natural and cultural values to be sustainably managed, and terms of reference to develop the corresponding Management Plan in order to assure sustainable tourism use in each area.

- Study of the existing infrastructure and equipment, needs assessment and estimated costs to develop new investments in this area.
- A Demand study with identification and quantification of the nautical eco and cultural tourism potential in Argentina and Uruguay, including bird watching by tourists from North America and Europe.
- Identification of local sources of water pollution and landscape degradation, causes and possible solutions regarding the stakeholders involved at the local level.
- The institutional and organizational arrangements for the execution of the Project and the partnership.
- An economical and financial feasibility study for the sustainable development of this priority project, including financial mechanism to develop and to sustain it.
- The base line for the Priority Project defined and a Monitoring and Evaluation component with proposed indicators to ascertain the benefits derived of the execution of the priority project.

### **Activities and financial inputs needed to enable changes**

**Activity 1. Study of the ecotourism and cultural offer.** Data collection and assessment of: i) the natural and cultural resources accessible by the Uruguay and Plata rivers and the Paraná Delta, identifying the legal status of the tourist attractions and the related areas to be included as part of tourist routes; ii) the existing services and the logistical needs to facilitate the access and lodging in the areas; the existing routes and organizations working in related activities. This activity would be developed based on the existing studies done by the CARU Bi-national Commission and on direct research trips, with the support of a consultant who will travel to recognize the resources, attractions and services and will prepare a complete report, with support materials, to show the natural and cultural tourist offer. This study will identify the legal status of the main attractions and the existing facilities to develop local activities and the interest of the local communities to promote and develop tourism based in these resources, with the identification of need for capacity building and adequate development of the areas affected. In addition, an analysis of the sustainable capacity of the resources will be conducted so as to establish the natural resilience to tourism activities and possible environmental impacts, proposing draft terms of reference to develop Management Plans needed to protect the biological, natural, and landscaping values. This activity will guide the Technical Unit of the FSAP in the identification of key partners in the private sector for possible involvement in Project activities, with the inclusion of a broad spectrum of companies, nautical clubs and tourism companies in both countries and upstream the Uruguay River, including the Paraná delta and Colonia del Sacramento areas.

**Output.** Final report and support materials, including the proposal for the development of the ecotourism and cultural offer, the identification of the legal status, and an assessment of the interest of local communities in the development of this activity. The activity will also result in a number of terms of reference to develop specific management plans for the sustainable use of each of the areas of natural or cultural interest identified and included as part of the proposal.

**Activity 2. Study of the nautical tourism offer and the Environmental quality.** This activity, to be developed in close coordination with the private sector of both countries, will seek to establish and describe the available infrastructure and equipment for nautical activities in the lower Uruguay River, the Paraná Delta and the area of influence. The study will cover the groups of interest and include a specific research on the main driving forces and restrictions that can orient the proposed development. This activity will be complemented with an assessment of the sources of water pollution and landscape degradation that affects the tourist offer at the local level, and the identification of possible solution involving local authorities and communities' organizations.

**Output.** Report describing the location and quantification of the infrastructure and equipment for nautical activities and related services in the region, and the interest and behavior of the different segments of this sector.

**Activity 3. Study of the potential tourism demand.** The study will be developed by two consultants (one for each country), in close relation with the private sector and the tourism authorities of both countries. The objective is to define the characteristics of the different groups of interest and to quantify the possible tourism-related travels from both sides of the Uruguay river. A particular international study will be developed

to ascertain the possibility of linking the proposed nautical tourism with the international travels of birdwatching tourists, seeking to develop this kind of tourism in the area.

**Output.** A complete report of the potential demand for the nautical ecotourism with the identification of different segments of interest.

The final reports of the Activities 1, 2 and 3 will be used to develop the base line for this Priority Project.

***Activity 4. Development of proposals for nautical routes and circuits for eco and cultural tourism.***

This activity will be developed in close coordination with the national institutions responsible for navigation in the Uruguay River and the Paraná Delta, and the participation of the private sector. The activity will analyze the characteristics of the river and alternative navigation routes to access the resources identified. A proposal for alternative routes to access the eco and cultural resources will be developed, identifying the main restrictions and considerations to take care of, and including costs of the different nautical routes. This activity will be complemented with the identification of key private companies or organizations with which to establish memorandums of understanding (MOU) for partnerships.

**Output.** Report, including nautical maps for the proposed routes and circuits for the development of eco and cultural tourism, and a list of key possible private partners to negotiate MOU.

***Activity 5. Study of required investments.*** This activity will be the result of the proposed developments and will be conducted in close consultation with the private sector involved in the projects and the local communities. The different specific pre-designs and the identification of investments needed and the financial arrangements with the private sector will be the main results of this activity.

**Output.** An investment plan and financial arrangements, with a description of the different steps to be developed.

***Activity 6. Arrangements for the Execution and the Replication of the Project.*** This activity will be conducted by the Technical Coordinator of the FSAP with the help of: i) an assistant lawyer, to develop the partnership with the different key actors involved and the private sector, and to propose the needed activities to be carried out to resolve legal aspects related to the proposed development and prepare and finalize the different agreements needed; ii) a social assistant to organize the local communities, to help the process of public participation and community involvement; iii) a publicist or communication expert, to design an advertising campaign and dissemination tools, and iv) a project economist, specialized in environmental projects, to integrate and evaluate in economic, financial and environmental terms the base line of this project and the proposal, and include economic mechanisms to assure the capacity to transfer funds for the protection of the natural resources and ecosystems involved. This specialist will also be responsible for preparing the M&E Plan for the execution of this Priority Project.

In addition, the project will prepare a publication describing the activities, arrangements, and benefits of the project, so as to promote and disseminate the activity internationally. The project will include a budget for the promotion of the project in international markets and conventions.

**Outputs.** Three kinds of agreements signed to assure the public-private partnership. Different local organizations to be strengthened based on the identification and analysis of communication and technical capacity building needs. The project document proposal structured and evaluated in economic, financial and environmental terms, including economic mechanisms to protect the natural resources involved. A dissemination plan to promote the activity. A publication prepared and disseminated describing the activities, arrangements, and benefits of the project, to be used to highlight the project in international meetings.

## **RISK AND SUSTAINABILITY**

The sustainability of this proposed priority project is related to its own characteristic as a public –private partnership to start a process for sustainable development. The tourism activity, as commercial one, relates with the private sector interests, but in this case, the private sector will collaborate to develop an activity to finance the protection of the natural and cultural values that are of global interest. As the proposal is related to the preparation of a study to help determine the feasibility of the activity, the sustainability is linked to the

results of the economic, financial and environmental evaluation, with the benefits derived from the local capacity to protect the natural resources, ecosystems, and cultural values of this region. If the studies demonstrate the feasibility of the project, once the project is finished, a basic infrastructure and local and bi-national arrangement will be established to allow the continuation of the activities into the future by the private sector.

The main risk of this project will be the difficulties to arrive to concrete agreements to establish a solid public-private partnership, and to assure the necessary demand that will make the activity economic and financially feasible.

This proposal was identified by the FSAP preparation during Block B phase, and conceived by the national institutions involved in the project, with particular interest of the Ministries of Environment and Tourism of Uruguay. The proposal was approved at the Project Steering Committee and considered a priority project at the CIC meeting.

The project will make use of the water resources in a sustainable way and as a natural service, helping to protect the environmental values of the ecosystems, the landscape and the heritage of the lower Uruguay River and the Paraná Delta areas. To assure the start and the preparation of the activity, there is a basic incremental financial need to build the partnership with the private sector and to subsidize the risk investment involved.

### **REPLICABILITY**

This study and the proposed project to be developed will look for opportunities to combine the existing nautical equipment, infrastructure and services, with the sustainable use of the existing natural and cultural resources of the lower Uruguay River and the Paraná Delta. It is based on the synergy to be created by linking the public and private sectors in the development of a particular type of tourism activity.

The way that economical and social activities should be oriented and how the project develops the mechanisms to finance the environmental protection, will be key factors to expand the experience and to replicate it. The project need to demonstrate how the public-private partnership can increase the local and national capacities to produce savings that can be used in the protection of the natural resources or to include the environmental dimension in these kind of economical activities.

Also, as a public-private partnership, this activity will represent a good case of study for future working agreements at the CIC and CARU Commissions in the La Plata Basin, and as model to be replicated in other parts of the world.

The project under this planning phase will prepare a small publication showing the existing base line for this activity, and the arrangements and benefits of the project. This will enable its promotion and dissemination in international markets, and help establish a starting point for the evaluation. For this purpose, a specific budget has been included to assure the capacity to promote the project among the private sector and in the international markets and conventions (see Activity 6).

### **STAKEHOLDER INVOLVEMENT**

As a public-private initiative, the project will rely on the establishment of agreements with key stakeholders. Also, given the involvement and interest of local communities in the project benefits, they will be organized and trained to develop local activities in support of tourism. Local communities will be involved as guide personnel for ecotourism, will develop needed local services, and help transmit local knowledge and cultural heritage to the visitors. In some cases, the municipalities will be involved as partners.

### **MONITORING AND EVALUATION PLAN**

#### **MONITORING & EVALUATION PLAN (M&E PLAN)**

The public-private agreements will define the ways in which the private sector and the different institutions involved in the project execution will follow the project activities, and how key indicators can be used to control the process in a positive and constructive way. The base line of this project will be established during the project study and proposal, and will define the indicators to measure the benefits and the progress of projects activities. The preparation of this priority project will take nearly two years. The preparation of the

study for the project will be analyzed during the mid term evaluation to the FSAP. If the project demonstrates economic, financial, and environmental feasibility, the initiative will be developed and implemented with institutional support from CIC. The M&E plan will be prepared by the environmental economist to be hired for Activity 6. The estimated time to prepare it is one (1) month, using the base line information received by the technical reports of the consultants working in Activities 1, 2 and 3.

The monitoring and evaluation plan for the study will use process indicators to follow the six activities in which the study is organized. These indicators are:

1. Agreements signed between:
  - CIC, CARU, Argentine Undersecretariat of Water Resources, Uruguayan National Directorate of Hydrographie and environmental and tourism institutions of both countries.
  - Number of Letters of Understanding with the private organizations interested to participate in the preparation of the project and its future execution.
2. A Working Group of the public-private partnership established within the framework of the CIC.
3. Study completed of the nautical eco and cultural tourism offer, including an assessment of the need to protect the natural and cultural resources.
4. Study completed of the potential tourism demand.
5. Proposals for nautical routes and circuits for eco and cultural tourism with maps produced.
6. Investments needed identified and quantified, including financial proposals and arrangements.
7. Project document finalized, including the arrangements for the execution and the replication of the Project.

#### **EXECUTION ARRANGEMENTS FOR IMPLEMENTATION**

The project will be prepared during the period of execution of the FSAP under the technical responsibility of the Technical International Coordinator of the Framework Program and under the directives of the Secretary General of the CIC. As with the other activities, the consultants will be hire based on their personal qualifications and experiences, following established OAS rules and regulations and in line with CIC procedures. A Working Group will be established to follow the preparation of this project. This Working Group will be integrated with delegates of the private and the public sectors involved, and a delegate of the CARU commission. The working group will meet at least five times during the estimated 22 months needed to prepare the priority project. At the first meeting, the working group will define the rules and procedures it will follow, and prepare the work plan for the execution of activities. At the last meeting, it will approve the project proposal to be submitted for consideration of the Steering Committee of the FSAP and the CIC.

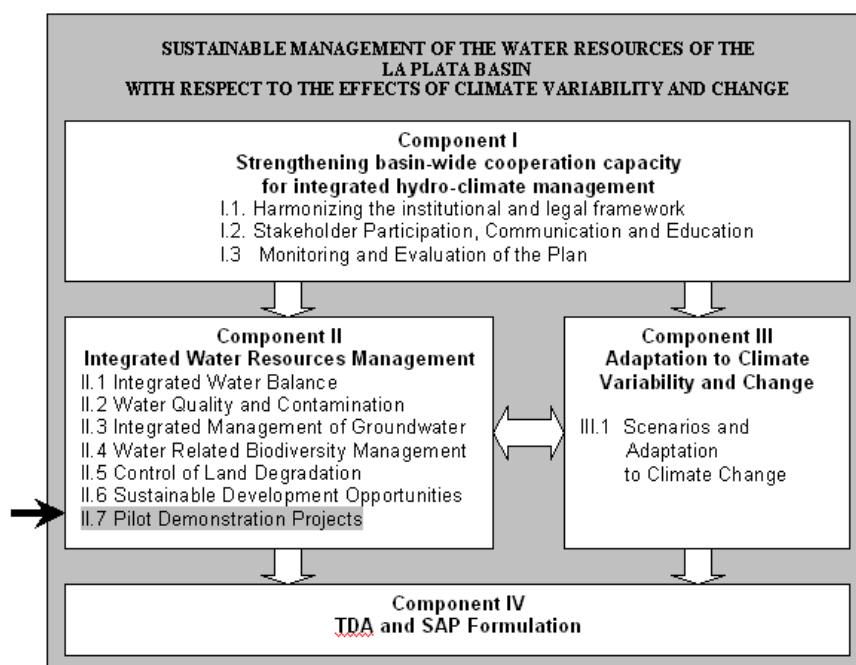


**SUBCOMPONENT  
II.7  
Pilot Demonstration Projects**

**Working Element II.7.1  
Pilot Demonstration for the Biodiversity Conservation  
in the Regulated Paraná River**

**Part 1: Project Identifiers –**

- 1.1 Sub-project title:** Pilot Demonstration for the Biodiversity Conservation in the Regulated Paraná River
- 1.2 Link to umbrella project:** Component II: Integrated Water Resources Management  
**II.7 Pilot Demonstration Projects**



**1.3 Geographical scope:**

The river reach (approximately 880 km) in the regulated Paraná River (Argentina, Brazil, Paraguay) comprising the confluence of the Paraná and Paraguay rivers and the towns of Guaíra(BR) and Salto del Guairá (PY), including Itaipu and Yacyretá binational dams

**1.4 Executing Agency/entity:**

CIC in cooperation with the following national institutions:

Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.

Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).

Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.

**1.5 Duration:**

Three years

**1.6 Focal area(s):**

IW

**1.7 GEF grant:**

**US\$ 207,000**

**1.8 Co-financing:**

**US\$ 1,544,000**

**1.9 Total funding:**

**US\$ 1,751,000**

**1.10 Contact person:**

Name: Miguel Angel López Arzamendia  
 Title: CIC Secretary General and Project Director  
 Tel: (54-11) 431 22 506  
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**1.11 Project summary:** The objective of the “Pilot Demonstration for the Biodiversity Conservation in the Regulated Paraná River” (PD-Biodiversity) is to contribute to the conservation of the biodiversity of the ichthyic resources in the Paraná River by promoting the development of management capacity of existing institutions in the Paraná River Basin at the river reach comprising the confluence of the Paraná and Paraguay Rivers and Guayrá Falls including the Itaipú and Yacyretá binational dams. This project will complement the on-going efforts of Itaipu Binacional and Entidad Binacional de Yacyretá. A management plan to preserve aquatic resources will be developed. A framework to harmonize legislation and strengthen local stakeholder capacity is anticipated, and will contribute to better understanding of transboundary issues related to biodiversity alteration and sustainable use of fisheries resources. The outcome, based on the pilot demonstrations, is a set of sound recommendations and agreed to actions, on erosion control, early warning system, water conflict resolution and biodiversity conservation, are formulated for inputs for sustainable development within the SAP. The expected project outputs of the PD-Biodiversity include:

- a) An Environmental Management Plan to preserve aquatic resources. The Plan will provide a regional strategy for biodiversity conservation, implemented in a demonstration (aquatic) ecological corridor. It will include an agreed monitoring system for exotic species, and the implementation of sustainable fisheries management measures by the three countries. The Plan will recommend reconstruction and protection of riparian and wetland corridors upstream of Itaipu and bellow Yacyterá, and dissemination of information on their benefits and services, and
- b) A documented framework and recommendations to harmonize legislation and strengthen local stakeholder capacity (to contribute to better understanding of transboundary issues related to biodiversity alteration and sustainable use of fisheries resources).
- c) The experience to be gained with the PD-Biodiversity will contribute to the strengthening of an integrated water resources management capacity in the Paraná River basin.

**Summary Table of subcomponent Work Elements, Output and Outcomes**

Work Element	Output	Outcome
1. Coordination/Advisor	A project coordination Unit for implementation and supervision of pilot project activities	Pilot project accomplishes its objectives and results within the expected timeframe and budget.
2. Evaluation of the ichthyic fauna and its habitat	<ul style="list-style-type: none"> <li>• A document outlining the results of ichthyic biodiversity evaluation in critical habitats, including migration pattern impacts, and a plan for the control of exotic species</li> <li>• A study on the cause-effect relationships between flows, water quality, and critical habitats</li> <li>• A document compiling fishing biology in the project area, including species of economic and ecological importance</li> </ul>	Increased knowledge and improved decision making capacity in government institutions for the conservation of aquatic biodiversity.
3. Definition of socio-economic and legal framework	<ul style="list-style-type: none"> <li>• A socio-economic study on sport and commercial fishing, and a proposal for legal harmonization</li> <li>• A stakeholder participation plan</li> <li>• Educational and training material on aquatic biodiversity</li> </ul>	Harmonized legislative framework and strengthened local stakeholder capacity for transboundary aquatic biodiversity management and sustainable use of fisheries resources.
4. Preparation of a Management Plan	<ul style="list-style-type: none"> <li>• An environmental management plan for the pilot project area, agreed upon</li> </ul>	Improved control of fishing activities and environmental sustainability in the

	and implemented by stakeholders	project area
5. Monitoring and evaluation	Progress and final reports on the Project implementation performance and expected results compliance	Lessons learned and recommendations for the sustainability and replication of the Pilot Project

### Summary Table of subcomponent Work Elements, Sources of Funding, and Costs

Work Element	GEF USD	co-financing USD	Total Cost USD
1. Coordination/Advisor	30,000		30,000
2. Evaluation of the ichthyic fauna and its habitat	74,000	794,000	868,000
3. Definition of socio-economic and legal framework	85,000	350,000	435,000
4. Preparation of a Management Plan	0	400,000	400,000
5. Monitoring and evaluation	18,000		18,000
<b>TOTAL</b>	<b>207,000</b>	<b>1,544,000</b>	<b>1,751,000</b>

## Part 2: Project design

### 2.1 Background and context:

**Background and introduction** The river reach comprising the confluence of the Paraná and Paraguay Rivers and Salto del Guayrá(PY)-Guaíra(BR), with an extension of 878 km, has significant importance due to the presence of two important binational dams: Itaipú (Brazil and Paraguay) and Yacyretá (Argentina and Paraguay). The Itaipu dam located has an installed capacity of 14000 MW, a reservoir surface area of 1350 km<sup>2</sup>, and an average depth of 22 m. The average annual discharge rate is approximately 30-40 days providing some regulation downstream. Upstream in the Guaira-Guaira axis (border between Brazil and Paraguay) there is an important valley prone to flooding that includes sensitive and protected areas. The area of influence of the Yacyretá dam starts in the axis of Candelaria-Campichuelo (border Paraguay-Argentina). The dam has an installed capacity of 3200 MW, a reservoir surface area of 1.200 km<sup>2</sup>, average low depth of 11m, and high renovation rate of 3-7 days. Generally, there are above average flows from the dam since there is low regulation control on the Paraná River. The tributaries of the reservoir are limited and small and many (especially in Paraguay) have waterfalls obstructing fish migration. The river reach between the two dams extends over a basaltic stretch of 280 km, with depths of up to 80 m or more. The riverbed is rocky and sandy with numerous falls on the tributaries and few floodplains.

Downstream the Yacyretá dam, is 230 km to the confluence with the Paraguay River, the reach is characterized by flood plains, and numerous island and riverbanks. Downstream, the river connects with a key biodiversity corridor (extension of 3000 km) linking the Pantanal to the Río de La Plata.

There are approximately 220 fish species in the Argentine-Paraguayan reach which represent and key role in the aquatic ecosystem due to their ability to transform organic material of low quality and little access, to high quality biomass, transferable to birds, reptiles and mammals. Their migration patterns promote spatial distribution of great amounts of organic materials and nutrients to less productive sites, increasing the diversity and productivity of upstream ecosystems. Additionally, in the lower part of Paraná and Paraguay rivers they naturally control insects and mollusks that transmit diseases to human beings.

The studies on Itaipu and Yacyretá are probably the most developed among neotropical reservoirs. In spite their significant socio-economic importance, there is limited knowledge on the essential biological and ecological aspects such as life cycle, habitats, migration and feeding patterns. Additionally, there is need for a common criteria guideline (for the three countries involved: Argentina, Brazil and Paraguay) for identifying fishes and measuring biodiversity.

The fishes in the area are characterized by a variety of functional groups including migrating piscivorous of open rivers (very important for the regional economy) such as the *manguruyú amarillo* and *abá, surubíes, dorado* and *patí* (*Paulicea luetkeni*, *Zungaro zungaro*, *Pseudoplatystoma corruscans* y *P. fasciatum*, *Salminus brasiliensis*, *Luciopimelodus pati*, respectively). Other important functional groups and great potential migrants are the herbivorous groups such as the *pacú*, the *river salmón* and the *bogas lisas* (*Piaractus mesopotamicus*, *Brycon orbygnianus*, *Schizodon spp.*). Among the detritivorous groups are included the *sábalo* and *viejas de agua* (*Prochilodus lineatus*, *Rhinelepis aspera*), which are also long distance migrants and very important for commercial fishing, especially in Brazil. Other groups are the insectivorous such as the *manduví* (*Auchenipterus nuchalis*), omnivorous such as the *armado amarillo* and the *boga* (*Pterodoras granulosus* and *Leporinus obtusidens*, respectively), alguivorous (*Hypostomus regani*) and benthofagous (*Oxydoras kneri*).

Considering the great taxonomic and functional diversity, conservation of the ichthyic fauna and associated critical habitats, represents a strategic step to guarantee their protection and conservation of the fluvial ecosystem biodiversity. Many fishes are considered threatened or commercially threatened. The list of endangered species of the Brazilian Ministry of Environment includes the river salmon (*Brycon orbgnyanus*) and other medium and small size species. The 2004 UICN Red List of threaten species does not include any of the migrating species.

The main potential impact on fish biodiversity and sustainable fishing activities are: 1) habitat modification due to the construction and operation of dams and other civil works; 2) uncontrolled fishing activities; 3) deforestation/agriculture activities; 4) introduction of exotic species and; 5) eutrophization and chemical contamination. The PD-Biodiversity will focus exclusively on the first four aspects.

The construction and operation of dams in the study area contributed to a strong fragmentation process subdividing the system basically into three distinct environmental units: a) area not influenced by the dam; b) tributary rivers; and c) reservoir area. Each has a distinct temporal and spatial dynamic and behavior, type of habitats, and requirements to conserve fish biodiversity.

A second key factor for the conservation of biodiversity is the recreational and commercial fish exploitation. Generations of families from the three countries have been depending on fishing activities for subsistence.

The Itaipu and Yacyretá dams have had distinct types of impacts on fishes. For example, studies show that downstream of the Yacyretá dam, up to the confluence of the rivers Paraná and Paraguay, fishes haven't decreased in number, only in size and species variation. This pattern is quite different at the Yacyretá reservoir where a drastic reduction on the number of fishes has been observed.

At the Itaipu dam the perception of fishermen is significantly different. In spite the fact that up to very recently there wasn't a fish facility structure, fishing in the Itaipú reservoir has a high record among all large dams in Brazil. This could be explained by the fact that the reservoir flood area links upstream floodplain areas (previously disconnected) enhancing biodiversity and fish growth and reproduction.

Development of responsible fisheries codes, fishing information systems, aquaculture, monitoring systems, and exotic species control protocols are required for sustainable management of fisheries resources and aquaculture.

Additionally, impacts from climate changes on hydrologic regimes need to be considered. Climate changes can drastically affect intensity, seasonality, temperature, frequency and duration of great floods and droughts, and consequently the biodiversity.

The El Niño floods of 1998 caused increase on fish biomass downstream of Yacyretá on the following three years. After, a reversal pattern occurred, with a drastic decrease of fish biomass on the subsequent years.

The fourth important aspect is the introduction of exotic species causing losses of biodiversity and habitat modification. At the Itaipu dam and upstream, the following species can be observed: *tucunaré* (*Cichla monoculus*), *corvina* (*Plagiscion squamosissimus*) - second largest commercial fishing, *tambaquí* (*Colossoma macropomum*) and the *acará* or *cara* (*Astronotus ocellatus*). In Paraguay and province of Misiones (Argentina) *tilapia* (*T. melanopleura*, *T. nilotica*, *T. honorum*) and *carpa* (*Cyrprinus carpio*) are commercially raised, on artificial tanks, sometimes very close to the river and without proper care and protection.

The mollusks that can be observed in the study area, since the decade of 1960, include the *corbícula* (*Corbicula fluminea* y *C. largillierti*) and, since 1997, the golden mussel (*Limnoperna fortunei*) - all originated from Southeast Asia. The latter specie can alter the benthos community favouring the presence of other less

frequent or displacing other autochthonous mollusks such as the *Chilina fluminea* and the *Gundlachia concentrica*.

The mollusk also can promote deep changes on the food web causing the system to be dominated by benthonic rather than planctonic processes. The invasive mollusks modifies the biogeochemical processes of nutrients, causing reduction on the density of phytoplankton and increasing the density of submerged aquatic plants, therefore inducing deep changes in the structure of the fish community.

Due to the ability of the bivalves to modify the environment on its behalf, there is a worldwide demographic growth of bivalves causing great damage on civil works around the world. The bivalves of the Plata Basin however form a new source in the food chain. In the medium reach of the Paraná River they are eaten (when grown up) by *Potamotrygon* sp., *Pimelodus albicans*, *Pimelodus* sp. Also the larvae *L. fortunei* is a food source for fishes. In the study area it was observed that numerous species feed on the *L. fortunei*, among them the *L. obtusidens* and *O. kneri*.

Another exotic species that proliferates in the Yacyretá reservoir is the *Melanoides tuberculata* serving as an intermediary parasite host affecting human populations.

Eutrophization and contamination have great impact on biodiversity. However they are not directly considered in the PD-Biodiversity.

Statement of Issue Among the key issues foreseen by the framework program are joint actions of the five countries to preserve and manage biodiversity of La Plata Basin, in view of the effects of climate variability and change on the hydrology of the Basin, with a particular focus on wetlands, coastal ecosystems, and biological corridor conservation, sustainable fishing, and exotic species control. The river reach (approximately 880 km) in the regulated Paraná River (Argentina, Brazil, Paraguay), comprising the confluence of the Paraná and Paraguay rivers and Guayrá Falls, has been identified as a priority areas of concern for biodiversity conservation addressing invasive species and the sustainable use of fisheries resources. The main reason are: (i) the rich ichthyic fauna in the area which includes at least 220 species of great ecological and economic importance and; (ii) the presence of two key transboundary dams of La Plata Basin: the binational dams of Itaipú (Brazil – Paraguay; 14.0 GW) and Yacyretá (Argentina – Paraguay; 3.2 GW).

The main aspects that can potentially impact biodiversity and fishing resources in the study area are: 1) existing civil works (dams, roads, bridges, ports, etc.); 2) fishing activities (currently very limited control and monitoring on commercial and recreational fishing activities); 3) global hydro climatic changes (changing the frequency and intensity of floods, modifying critical habitats, the biodiversity and fishing production); 4) presence of exotic species (specially the golden mussel which can drastically alter water quality and habitats) and; 5) water quality of the river system.

2.2 subcomponent objective: The objective of the “Pilot Demonstration for the Biodiversity Conservation in the Regulated Paraná River” (PD-Biodiversity) is to contribute to the conservation of the biodiversity of the ichthyic resources in the Paraná River. This objectives will be achieved through developing management capacity for improving aquatic resources in the Paraná River basin at the river reach comprising the confluence of the Paraná and Paraguay Rivers and Guayrá Falls including the Itaipú and Yacyretá reservoirs. The main tasks include:

- a) Evaluating the ichthyic biodiversity in critical habitats, including exotic species.
- b) Preparing a socio-economic study on sport and commercial fishing, including recommendations on re-conversion of fishermen, and a proposal for legal harmonization, and
- c) Preparing an Environmental Management Plan for the area encompassed by the pilot project, agreed upon and implemented with the main stakeholders.

2.3 Environmental benefits: The main environmental benefit expected from the project is the biodiversity conservation in the modified environment of river reach due to the construction of dams and other anthropogenic activities in the Paraná Basin. A better understanding of critical habitats, as well as of ecology of the native and exotic species and of the behavior of migrating species, in addition to a management plan and capacity building of social actors involved, will be conducive to environmental improvement in the area.

The studies that are and will continue being done by the scientific community will allow the development of scenarios and research needs, and will provide the basis for a harmonized regional strategy for biodiversity conservation, consistent with the objectives and requirements of the Biodiversity Convention.

2.4 Overall sub-project Outcomes: The outcome, based on the pilot demonstrations, a set of sound recommendations and agreed to actions, on erosion control, early warning system, water conflict resolution and biodiversity conservation, are formulated for inputs for sustainable development within the SAP. Specifically, the outputs will include:

- An Environmental Management Plan to preserve aquatic resources. The Plan will provide a regional strategy for biodiversity conservation, implemented in a demonstration ecological corridor. It will include an agreed monitoring system for exotic species, and implementation of sustainable fisheries management measures by the three countries. The Plan will recommend reconstruction and protection of riparian and wetland corridors, and dissemination of information on their benefits and services and
- A documented framework and recommendations to harmonize legislation and strengthen local stakeholder capacity (to contribute to better understanding of transboundary issues related to biodiversity alteration and sustainable use of fisheries resources).
- Program activities will result in socio-economic assessments based on biodiversity conservation, and identification of economic opportunities associated with such conservation. This PD-Biodiversity will serve as the basis for other initiatives of the Basin. The experience to be gained with the PD-Biodiversity will contribute to the strengthening of integrated water resources management capacity in the Paraná River Basin.

2.5. Consistency of the sub-project with national/regional priorities and plans: This Project PD-Biodiversity will integrate with local, regional, and international initiatives as well as strengthening the CIC-Plata (Argentina, Brazil, Bolivia, Paraguay y Uruguay) and supporting sustainable development of the Plata Basin. The pilot project will complement the "Itaipú, cultivando água boa" initiative, and related environmental projects and sub-projects. The project premise is that in the same way that soil cultivation is required for raising good crops, cultivating good water is required to preserve ecosystems - including the adequate management of solid wastes and recycling programs, youth gardening and participation of indigenous communities, cultivation of medicinal plants, and promotion of organic farming and adoption of sustainable agricultural and fisheries practices, leading to protection of biodiversity and environmental health.

The PD-Biodiversity will harmonize these initiatives with current legislation particularly with Argentina downstream of the Itaipú dam. Since Itaipú binational includes Paraguay and Brazil, the Paraguay reach of Itaipú will need to be validated with the Argentinean legislation.

The PD-Biodiversity will have a strict relation with various official Argentinean institutions to achieve project objectives. In Argentina the key institutions that interfere on water resources management include: (i) the Ministry of Foreign Affairs and International Commerce, through the Secretary of Foreign Affairs and Latin American Matters interceding on transboundary basins; (ii) the Secretary of Environment and Sustainable Development arbitrating on matters related to aquaculture, fishing and contamination; (iii) the Secretary of Energy with specific interest and competence on the use of the water resource; (iv) the National Entity of Sanitation Works (ENOHSA) and; (v) the Regulating Agency for Dam Security (ORSEP). Finally, there are a series of public institutions, at the national level, gathering, recompiling and processing baseline information and performing a wide range of studies. Important examples are the National Water Institute (INA) and the National Meteorological Service.

2.7 Coordination and linkages to the umbrella project activities and other related activities in the basin:

There are several initiatives under development in the region. Besides the Itaipu and Yaciretá studies and measures already implemented for the improvement of the biodiversity in the river reach, the efforts of Paraguay and Argentina should also be mentioned, regarding the implementation of programs for the protection and management of the wetlands in the area of the confluence of the Paraná and Paraguay rivers, in accordance with the Ramsar Convention.

In addition, the PD-Biodiversity will work together with the initiative "HELP" (Hydrology for Ecology, Life and Policy) of UNESCO which considers the Plata Basin as a priority basin in the world. Also, the PD-Biodiversity will follow the guidelines of the World Meteorological Organization and the United Nations

International Strategy for Disaster Reduction on prevention and early warning, in as much as the biodiversity protection issues are concerned.

## 2.8 Incremental reasoning

Baseline As it was said before, the studies on the ichthyic biodiversity in the Itaipu and Yaciretá reservoirs are probably the most developed ones among Neotropical reservoirs. In spite their great importance; there is limited knowledge on the essential biological and ecological aspects such as life cycle, habitats, migration, and feeding patterns. Additionally, there is need for a common criteria guideline (for the three countries involved: Argentina, Brazil and Paraguay) for identifying fishes and measuring biodiversity.

Considering management requirements there is a lack of harmonization among the specific national legislations of the three countries and a lack of a common management plan of fishing and biodiversity conservation in the regulated Paraná River.

Professional and sportive fishing has been an important factor for the subsistence and well-being of riparian communities which have been affected by the anthropogenic activity in the basin and uncontrolled exotic species presence.

Increment The Pilot Demonstration Biodiversity will increase the efforts being done by Itaipu and Yaciretá and will allow increasing the present knowledge and expedite attainment of an important goal such as the harmonization of legal frameworks regarding the fishing and biodiversity conservation in the Project area.

Besides this aspect, the experienced and knowledge gained by Itaipu and Yaciretá, fostered by the Pilot Demonstration can be disseminated and replicated in a larger scale.

Alternative Without the financial and institutional support that will allow the carrying out the present Pilot Demonstration, as such, Itaipu and Yaciretá would continue developing their studies, however, at their own pace and for their own benefit.

Incremental reasoning It is important to emphasize the catalytic effect that is expected from this Pilot Demonstration regarding the possibility for disseminating results and replicability not only within the La Plata Basin, but also through the GEF mechanisms such as the IW-Learn web system, potentially being accessible to other similar projects.

2.9Activities – outputs – outcome:

Subcomponent Objective & Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<p>Contribute to the conservation of the biodiversity of the ichthyic resources in the Paraná River by promoting the development of management capacity of existing institutions in the Paraná River Basin at the river reach comprising the confluence of the Paraná and Paraguay Rivers</p>	<p>Availability of ichthyofauna habitats database and maps</p> <p>Socio-economic studies</p> <p>Information and capacity building on alternative fishing methods</p> <p>Preparation and implementation of Management Plan</p>	<p>No studies available on fisheries habitat and migration patterns;</p> <p>No coordinated actions or legal framework in place for sustainable fisheries management</p>	<p>Practices on sustainable management of the ichthyic resources and control of the exotic species agreed upon by Y3.</p> <p>Documented participatory experiences on biodiversity protection along the regulated Parana River and its coastal wetlands at the end of the 3rd. Year.</p> <p>Replication strategy as input to the SAP is completed by year 3.</p> <p>Documented records with respect to communication and dissemination of the PDP experience in the framework of the LPB Framework Program and worldwide by the end of the PDP execution (3rd. Year).</p>	<p>Biodiversity conservation planning process in place and relevant conservation actions tested in the Regulated Parana River, including the Itaipu and Yacyreta dams in Argentina, Brazil, and Paraguay</p> <p>Multiple stakeholders participate in the protection of the river and coastal wetland ecosystems and ensure sustainable management of the ichthyic resources and exotic species.</p> <p>Agreed upon legal framework for sporting and commercial fishing activities</p> <p>Replication strategy formulated for up scaling conservation practices throughout the La Plata River Basin (LPRB).</p>



Subcomponent Objective & Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<p>I.7.1 A Biodiversity Management Plan, reflects the findings of the complete ichthyo-faunal biodiversity evaluation in critical habitats, together with a fisheries sector socio-economic analysis, and provides recommendations for sustainable fishing methods and investment opportunities</p>	<p>Improved knowledge for the conservation of the fish population and biodiversity in the regulated Itaipu and Yaciretá reservoirs</p> <p>Better diagnosis and planning</p> <p>Support programs for the control of the golden mussel</p>	<p>No basin management plan available. Uncoordinated fishing activities.</p>	<p>- Strategic good practices on sustainable management of the ichthyic resources and control of the exotic species agreed upon by Y3.</p> <p>- Replication and dissemination strategy as input to the SAP available by Y3</p> <p>-</p>	<p>Agreed Environmental Management Plan (EMPBC) completed, published and disseminated by Y3, Q4, including:</p> <ul style="list-style-type: none"> <li>- Synthesis of migration patterns. Impacts of the golden mussel on the ichthyic fauna.</li> <li>- Compilation on the fishing biology including species of economic and ecological importance</li> <li>- An ichthyic biodiversity evaluation in critical habitats, including control measures of exotic species.</li> <li>- Study on the cause-effect relationships between flows, water quality, and critical habitats</li> </ul>
	<p>Implementation of sustainable fisheries management by the three countries</p>	<p>Unsustainable fishing activities in the project area;</p>	<p>Socio-economic analysis of recreational and commercial fishing and their projected effects on fish populations by Y2, Q3.</p> <p>Analysis and harmonization of current legal and regulatory frameworks, at the national and regional levels, by Y3, Q2.</p> <p>Educational and training workshops for fisherman and local government officials.</p> <p>- Alternative employment</p>	<p>Completion of a socio-economic study on recreational angling and commercial fishing, including recommendations for alternative fishing methods (aquaculture, changes in gear) and a proposal for legal harmonization by the end of the Project</p>

Subcomponent Objective & Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
			for fishermen during low seasons.	
	A regional strategy for biodiversity conservation shared by the three countries, for the regulated Paraná river and the wetland corridors.  Improved control of fishing activities  Environmental sustainability	No regional strategy for biodiversity conservation	First draft of Environmental Management Plan (EMPBC) completed and shared with stakeholders by Y2, Q1.	- An environmental management plan for the area encompassed by the pilot project, agreed upon and implemented with the main stakeholders
	Lessons learned and recommendations for the sustainability and replication of the Pilot Demonstration	0	- Monthly, quarterly, half year and yearly substantive and financial reports available on the project website.	Progress and final reports on the Project implementation performance and compliance on expected results

#### II.7.1 Pilot Demonstration: Biodiversity conservation in the regulated Parana River

*Objective:* Contribute to the conservation of the biodiversity of the ichthyic resources in the Paraná River by promoting the development of management capacity of existing institutions in the Paraná River Basin at the river reach comprising the confluence of the Paraná and Paraguay Rivers.

*Outcome:* A Biodiversity Management Plan, reflects the findings of the complete ichthyo-faunal biodiversity evaluation in critical habitats, together with a fisheries sector socio-economic analysis, and provides recommendations for sustainable fishing methods and investment opportunities

*Output:* Pilot Demonstration: Biodiversity conservation in the regulated Parana River

*Activities:*

- a) Establish pilot-demo coordination unit
- b) Evaluate of basin's ichthyic fauna habitats
- c) Define a socio-economic legal framework for the basin's biodiversity
- d) Prepare a biodiversity management plan and scale-up strategy
- e) Monitor and evaluate pilot demonstration

Output and activity	Description of indicator	Baseline level	Mid-term target	End-of-project target
Pilot Demonstration: Biodiversity conservation in the regulated Parana River				
Evaluation of basin's ichthyic fauna habitats	Studies and reports characterizing ichthyic biodiversity in critical habitats.  Measures to control exotic species.	No studies available on the basin's ichthyic fauna habitats, migration patterns, impacts of exotic species and	-Assessment of Parana basin critical aquatic fish habitats and effects of environmental contamination on fish population by	Maps and geo-referenced (GIS-based) database with the biological information about fish, habitats and linkages with wetlands and coastal ecosystems, etc.

	<p>Habitat modeling in the Regulated Parana River zone.</p> <p>Analysis of environmental contamination and fishing on river ecosystems, reservoirs, and wetlands</p>	<p>human intervention</p>	<p>Y3, Q3.</p> <ul style="list-style-type: none"> <li>- Database &amp; GIS system by Y3, Q3.</li> <li>- Biodiversity and fish population inventories including a study of golden mussel and their impact on native species by the end of the Y1 with the inventory and behavior of existing exotic species by the end of Y2.</li> <li>- Study of fish migrations and habits.</li> <li>-Assessment of demographic parameters of fish populations.</li> <li>- Design and calibration of ecological models of fish migration, fish populations, contamination effects on fish population, and invasive species proliferation Y2, Q3.</li> <li>-Simulations of habitat and population changes under various hydro-climatic and management scenarios by Y3 Q1.</li> <li>- Monitoring program to locally manage and control exotic species during Y3, Q1.</li> <li>- National teams dealing with biological issues and ecosystem conservation established and</li> </ul>	<p>Assessment, specific studies and inventory reports posted on the web</p> <p>Models of river and coastal wetland's critical habitats available on the project website and accessible for all interested stakeholder.</p> <p>Ecological models available on the project website and used by local institutions</p> <p>Periodic reports from the implementation of monitoring program available on eh project website. Use of monitoring information for management responses documented on the project website.</p> <p>Aide memoir of national tri-annual meetings available on the project website.</p>
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			meeting three times a year.	
Definition of socio-economic and legal framework	<p>Studies and analysis of human interventions in fish ecosystems, use of natural resources, and the impact of human interventions on local ecosystems</p> <p>-Training and educational programs, based on the socio-economic studies, to increase public participation and knowledge.</p> <p>Studies and analysis of current legislation combined with socio-economic studies to harmonize international biodiversity legislation.</p>		<p>Socio-economic analysis of recreation and commercial fishing and their effect on fish populations by Y2, Q3.</p> <p>-Analysis and harmonization of current national and regional legal and regulatory frameworks by Y3, Q2.</p> <p>-Educational and training workshops for fisherman and local government officials.</p> <p>- Alternative employment for fishermen during low seasons.</p>	<p>A socio-economic study on sport and commercial fishing, including recommendations on the activities of fishermen, and a proposal for legal harmonization</p> <p>Active involvement of stakeholders on sustainable fishing activities at different levels</p> <p>Dissemination of educational and training material</p>
Preparation of biodiversity management plan and scale-up strategy	- Environmental Management Plan prepared and used by local stakeholders to protect the environment and improve socio-economic conditions of riparian communities.		<p>- An agreed Environmental Management Plan (EMPBC) completed, published and disseminated by Y3, Q4 with a first draft shared with stakeholders by Y2, Q1.</p> <p>- Preparation of the GIS and database of social, economic, and ecological data for the regulated Parana River and coastal wetlands by Y2</p> <p>- Proposals for the sustainable operation of dams in the basin including flood management responses and biodiversity conservation measures by Y2.</p>	<p>An environmental management plan for the area encompassed by the pilot project, agreed upon and implemented with the main stakeholders. Plan includes:</p> <ul style="list-style-type: none"> <li>• -technical guidelines and criteria for the conservation of ichthyic biodiversity,</li> <li>• incentive programs for sustainable fishing,</li> <li>• A regulatory framework for sustainable fishing and exotic species control.</li> </ul>
Monitoring and evaluation of	-Financial and		- PDP Monitoring	-Adequate and timely

pilot demonstration project	<p>technical reports reflecting project implementation progress according to monitoring and oversight plan.</p> <p>- Strategy for replication of pilot project within the la Plata River Basin.</p> <p>- M&amp;E reports</p>		<p>and oversight plan as well Implementation plan as an element of the overall Plata project M&amp;E system by Y1 Q1.</p> <p>- Quarterly, half yearly and PIR reports prepared according to schedule</p> <p>- Documented replication strategy and records of its use in other parts of the Plata Basin. Use of the Replication strategy as input in the formulation of the SAP.</p> <p>- Documented lessons learned and best practices as inputs for the formulation of the SAP.</p> <p>- Records of the preparation and conduct of the mid term and final evaluation including project management response to the midterm review.</p>	<p>project financial and substantive monitoring in accordance with the project's detailed implementation plan as well as monitoring and oversight plans.</p> <p>- Replication strategy for the PDP within the la Plata River Basin and for uptake in the context of the SAP formulation.</p> <p>M&amp;E reports incorporating both project progress and replicability.</p> <p>- Mid term and final evaluation documents and project management response available on the project website</p>
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## 2.9 Budget:

### GEF Budget

	Work Element	Year 1	Year 2	Year 3	Total
1200	Consultants	17,122	17,122	17,756	52,000
2200	Sub-contracts with institutions	12,000	40,000	0	52,000
3200	Workshops & training	10,000	25,000	0	35,000
4100	Equipment & supplies	50,000	0	0	50,000
5200	Publications and documents	6,000	6,000	6,000	18,000

	Work Element	Year 1	Year 2	Year 3	Total
	TOTAL	95,122	88,122	23,756	207,000

### Co-financing

Source	Type	Year 1	Year 2	Year 3	Total
Governments Contribution	In kind	266,000	266,000	262,000	794,000
Itaipu Binacional	In kind	165,000	165,000	20,000	350,000
FONPLATA	Cash	53,000	144,000	203,000	400,000
<b>TOTAL Co-financing</b>		<b>484,000</b>	<b>575,000</b>	<b>485,000</b>	<b>1,544,000</b>

### Consultants working for technical assistance components:

Component	Estimated person weeks	GEF (\$)	FONPLATA (\$)	Project total (\$)
Local consultants – <i>US\$400/week</i>	144	-	57,600	57,600
Local consultants – <i>US\$750/week</i>	280	27,000	120,000	147,000
Local consultants – <i>US\$1,000/week</i>	18	18,000	-	18,000
Local consultants – <i>US\$1,250/week</i>	24	30,000	-	30,000
<b>Total</b>		<b>75,000</b>	<b>177,600</b>	<b>252,600</b>

### Consultants to be hired for the project

Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
<b>For Technical Assistance</b>			
Local			
Consultant GEF 1.	1,250	24	LPFP Technical Advisor (GEF)
Consultant GEF 2	750	16	Ichthyic fauna specialist (critical fish habitat)
Consultant GEF 3	750	4	Fishing specialist (statistics processing)
Consultant GEF 4	750	12	Golden mussel specialist (habitat analysis)
Consultant GEF 5	750	4	Fishing legislation harmonization
Consultant GEF 6	1,000	18	Pilot Demonstration Monitoring and Evaluation
Consultant FONPLATA 1	400	144	Pilot Demonstration Tech. Coordinator (FONPLATA)
Consultant FONPLATA 2	750	32	Fishing socio-economy (alternative activities)
Consultant FONPLATA 3	750	32	Fish habitat modeling
Consultant FONPLATA 4	750	24	Wetlands modeling
Consultant FONPLATA 5	750	24	Fishermen training on alternative activities
Consultant FONPLATA 6	750	48	Elaboration of the Management Plan

**Sub-Contracts with Institutions**

<b>Sub-Contracts</b>	<b>GEF (\$)</b>	<b>FONPLATA (\$)</b>	<b>Tasks to be performed</b>
<b>For Technical Assistance</b>			
Local			
Sub-Contract 1	12,000	-	Elaboration of a SIG including data acquisition and preparation of maps
Sub-Contract 2	20,000	-	Field eco-soundings campaigns and fish migration tracing
Sub-Contract 3	20,000		Habitat modeling and calibration (reservoirs)
Sub-Contract 4		20,000	Habitat modeling and calibration (wetlands)
Sub-Contract 5	-	15,000	Arrangements for 3 Workshops in Argentina
Sub-Contract 6	-	15,000	Arrangements for 3 Workshops in Brazil
Sub-Contract 7	-	15,000	Arrangements for 3 Workshops in Paraguai
Sub-Contract 8		15,000	Socio-Economic survey in Argentina
Sub-Contract 9		15,000	Socio-Economic survey in Brazil
Sub-Contract 10		15,000	Socio-Economic survey in Paraguai

**2.10 Timetable:**

<b>Component/Activity</b>	<b>Year 1</b>						<b>Year 2</b>						<b>Year 3</b>					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
<b>Component 1. Coordination and execution arrangement</b>																		
<b>Component 2. Ichthyic fauna and its habitat</b>																		
<b>Component 3. Socio-economic and legal framework</b>																		
<b>Component 4. Management Plan</b>																		
<b>Component 5. Monitoring and evaluation</b>																		

**2.11 Cost effectiveness:** This Pilot Demonstration is addressing the biodiversity conservation issue in an aquatic environment that was modified by the construction of Itaipu and Yaciretá dams and by other anthropogenic activities. By its nature, considering that the Paraná river and its tributaries flow through geographical portions of three countries, it is a transboundary issue, which requires consideration and coordination of different legal and institutional aspects.

Taking a regional approach at the transboundary level, in this case by selecting a river reach under the jurisdiction of the three countries, two by two, as resulting from the fact that the two binational dams define two sub-ecosystems, the issue may be dealt with in a much more effective way as compared with alternative approaches of undertakings made on an individual or national basin. Consequently, countries will be able to share the results and reach a much more effective consensus about the solutions proposed for their common problem. The efforts and costs then become much more effective since both human and financial resources may be optimized and results obtained in a much larger scale. By working together, exchanging information, the three countries will be able to overcome asymmetries by leveling out technical capacities in a less costly way and with higher benefits, for the objective of straitening and strengthening regional integration.

Besides, by making information available, the three countries may benefit from the common experience and replicate it whenever similar cases occur, thus saving time and resources. This asset is even of greater importance if the experience is disseminated through GEF mechanisms such as the IW-Learn system, for the benefit of the global community.

**2.12 Risk Analysis:** The risks involved in this Pilot Demonstration are deemed to be very low, considering that the motivation of institutions and primary stakeholders are consolidated by the work that they have been carrying out for some years in the same subject. The additional advances in their scope will depend less on their own effort and institutional arrangements than on the compliance requirements set by the donors of the financial resources, in this case GEF and FONPLATA, which also represent a very low risk as the Project monitoring and evaluation procedures will allow for ample opportunity to make the necessary adaptations along the three years of its development.

However, the dimensions of the Project Area and different cultures among fishermen may require special attention, as well as the difficulty that may occur in the search for the harmonization of the legal framework applicable to control the fishing activity and biodiversity in the regulated Paraná River.

Risk	Rating (L/M/H)	Risk Mitigation Measures
The Pilot Demonstration shows little coordination with the umbrella La Plata Framework Project	L	Analysis of progress reports and corrections as needed
Geographic extension of the Basin is a limitation to effective and efficient participation and the active involvement of fishermen	L	Promotion of strong linkages among stakeholders in a transboundary environment, including civil society, professional bodies, and relevant governmental bodies to disseminate PD project results and good practices
Harmonization of legal framework to control fishing activities and biodiversity is difficult.	L	Promotion of consensus as much as possible among stakeholders, based on the beneficial aspects of the proposals

### **2.13 Sustainability:**

*Institutional* The project should be developed using local human resources of national and local institutions to guarantee project sustainability. The responsible institutions include National Project Units, the Itaipú, Yaciretá and Salto Grande binational organizations, National Environmental Secretariats, National Fishery Institutions, and civil society organizations involved through the Public Participation Fund. Other institutions involved include: Centres for Investigation and Monitoring

- FCV: Department of Veterinary Sciences, National University of Asunción (Paraguay);
- FACEN: Department of Exact and Natural Sciences, National University of Asunción (Paraguay);
- CONICET: National Council of Science and Technology, Argentina;
- UEM/NUPELIA: Maringá State University / Limnology, Ichthyic and Aquaculture Research Center (Brazil);
- UNIOESTE, Toledo, Paraná State, Brazil;
- INICNE: Northeast Ictiology Institute, National Northeast University, Corrientes, Argentina;
- UNaM: Misiones National University, Misiones, Argentina;
- CENEHA Hydro-Environmental Studies Center/FICH (Engineer and Hydraulics Sciences Department)/UNL (National Coastal University).

#### *Management Agencies*

- SEAM: Environment Secretariat, Paraguay ;
- SENASA. National Environmental Sanitation Services (Paraguay);
- COMIP: Mixed Commission Argentina Paraguay from Paraná River ;
- ITAIPU: Itaipú Binational, Brazil-Paraguay ;
- YACYRETA: Binational Entity Yacyretá (Argentina-Paraguay) ;
- SAyDS: Environmental and Sustainable Development Secretariat, Argentina;
- Ecology Ministry from the Misiones Province (Argentina);
- Subdivision of Fauna Flora from Corrientes Province (Argentina);



- Environment State Secretariat, Paraná (Brasil);
- Environment and Sustainable Development State Secretariat, Mato Grosso do Sul (Brazil);
- MMA: Environment Ministry, Brazil;
- Fisherman Cooperatives from Chaco (Argentina);
- Fisherman Cooperatives de Pescadores de Corrientes (Argentina);
- Tourism Directory from Chaco (Argentina);
- National Tourism Secretariat from Paraguay;
- Coast Guard, Argentina;
- Paraguay Republic Armada.

The sustainability of the project would also be provided through the involvement of the Intergovernmental Coordinating Committee of the Plata Countries (CIC), the countries, provinces or directorates, the universities, etc. The integration and exchange of information among national and international governmental and non-governmental entities as well as scientific communities also contributes towards project sustainability.

*Environmental.* The project will promote research to increase the knowledge and understanding of (i) sustainable management of fisheries resources and aquaculture (including development of responsible fisheries codes, fishing information systems, and potential aquaculture areas agreed among the five countries, monitoring systems and exotic species control protocols); (ii) common actions to preserve and manage biodiversity according to the rules of the countries implemented pursuant to their national strategies developed in terms of the Biodiversity Convention and; (iii) conservation of the riverine corridors and wetlands supported by key actions to promote public participation.

The project will provide a harmonized regional strategy for biodiversity conservation consistent with the objectives and requirements of the Biodiversity Convention, implemented in a demonstration ecological corridor.

The project will enhance: (i) elaboration of an agreed monitoring system for exotic species, and implementation of sustainable fisheries management measures in the three countries and; (ii) reconstruction and protection of riparian and wetland corridors, and dissemination of information on their benefits and services. Program activities will result in socio-economic assessments based on biodiversity conservation, and identification of economic opportunities associated with such conservation.

*Finacial* The Framework Program is an initiative of Argentina, Bolivia, Brazil, Paraguay and Uruguay for the integrated management of the water resources of La Plata Basin. The Intergovernmental Committee of La Plata Basin Countries (CIC) will be the local executing agency; the Organization of the American States (OAS) will be the executing agency; and the United Nations Environmental Program (UNEP) will be the implementing agency. The PD-Biodiversity will be financed by Global Environmental Facility (GEF), FONPLATA, and by the countries as counterparts.

2.14 Replicability: It is important to emphasize the interrelationship of the PD-Biodiversity with the different components of the Framework Program, and the importance of the replicability of the Pilot Demonstration to other vulnerable locations in the La Plata Basin. Replicability of the project execution will be assured through its incorporation into the Framework Program.

The Project has a strong social component and will develop strategies that are transferable to the society and that guarantee preservation of biodiversity of aquatic resources promoting sustainable development. It is expected a change of paradigm in terms of conservation strategies and practices supported by legal frameworks of the countries. Thousands of people within the La Plata Basin will benefit from the projects including subsistence, commercial, and recreational fishermen, sporting activities, tourist operators, ecological tourism, government agencies, and others. Another beneficiary will be existing (and future) hydropower generating plants.

The success experiences of the PD-Biodiversity will be replicated and applied in other areas of the La Plata Basin (Uruguay, Bolivia and other departments, provinces or states of Paraguay, Argentina and Brazil have similar problems). Key experience areas include sampling methodologies, biological and ecological parameters, and habitat models (which can be used in the restoration of other rivers that lost ecological integrity).

**2.15 Execution arrangement:** The project will be executed -as part of the Framework Program- by the Intergovernmental Coordinating Committee for the Plata Basin countries (CIC) and the national and local governmental organization of Argentina, Brazil and Paraguay. The coordination and supervision will be carried out by Technical Coordinator. Technical Advisors will be contracted for specific tasks including technical report preparation, conduct of meetings, press releases and support to public participation.

The Technical Coordinator of the Project will lead the execution in direct relationship with a Local Executing Council. The Council will be composed by two representatives of each country (total of six), under the direction of the National Coordinator of the Framework Program. This group will get together periodically to verify and perform required changes on planned tasks. A National Team for each country will be created composed of representatives of the different stakeholders involved (fishermen, entrepreneurs, NGO's, and others) with duties defined by each country. The two representatives of each country will make part of the National Team and will transmit the national views and position to the Local Executing Council.

The Director of the PD-Biodiversity project is the Director of the Framework Program (also Secretary of the CIC). There will be 3 national coordinators designated by each country. The Technical Coordinator of the PD-Biodiversity project will be elected following the methodology established for the Framework Program, and will coordinate all the tasks. The Technical Coordinator of the PD-Biodiversity will depend technically of the International Technical Coordination of the Framework Program. Routine and frequent coordination meetings will be held. OAS as executing agency will perform the financial administration of the Framework Program and the PD-Biodiversity.

The project will be developed with national and local human resources to guarantee sustainability of the project. Consulting activities should be minimized in order to strengthen local capacities. Consulting should be for support/coordination, but with specific scopes and limited timeframes.

Strong participation of technical teams of Itaipu and Yaciretá, as well as of universities and specialized institutes in Argentina, Brazil and Paraguay will be encouraged, including graduate study scholarships.

Part of the information data base from the PD-Hydrologic Alert System project would be included to generate benefits and synergies among projects.

An essential aspect is to include in the project the gender issue and to promote the participation of woman, as well as ethnical minorities.

**2.16 Public participation mechanisms:** Local residents, fishermen and farmers will be involved in the Project by providing field information and data on fishing statistics and will participate in environmental education programs which will be focused on new sustainable fishing techniques.

**2.17 M&E:** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed and comprehensive Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

#### **Performance and Achievement Indicators and means of verification**

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
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Indicator/ Description	Parameters measured	Baseline value	Means of Verification
Biodiversity Conservation in the Regulated Paraná River (Argentina, Brazil and Paraguay) Ichthyic biodiversity evaluation Socio-economic study Environmental Management Plan	Habitats maps under different Climate Change Scenarios Recreational and commercial fishing study Environmental Plan completed and letters of endorsement Dam operators participation	N/A	Project progress and final reports Maps Endorsement letters and other formal instruments Coordinated legal and regulatory instruments for transboundary fishery – seasonal fishing banning Technical encounters among dam operators personnel and project personnel Budget and programs of the dam operators for coping with exotic species

#### PROCESS OUTCOMES AND INDICATORS

Process OUTCOMES	Process INDICATORS
Multi-country agreement on transboundary priority concerns, impact and cause	<ul style="list-style-type: none"> <li>Constitution of the Technical Group of the CIC relating to the Pilot Demonstration as an advisory committee for the execution of the Project 2 months after its beginning .</li> <li>Reports and minutes of meetings of the Technical Counterpart of the CIC concerning biodiversity.</li> <li>Harmonized regional strategy for biodiversity conservation in the regulated Paraná river stretch, including consideration of the wetlands environments at the confluence with the Paraguay river, within the framework of the Ramsar and UN Biodiversity Conventions and other international treaties and agreements by the end of the project</li> <li>Environmental Management Designed Plan for a the regulated Paraná river stretch developed by the end of the project</li> <li>Preparation of a Monitoring System for controlling the introduction of exotic ichthyc fauna by the end of the project</li> </ul>
Multi-country agreement on governance reforms and investment to address priority transboundary concern	<ul style="list-style-type: none"> <li>Harmonized regulatory fishery measures amongst the riparian countries by the end of the project</li> </ul>
Effective national Inter-ministry Coordination	<ul style="list-style-type: none"> <li>Inter-ministerial mechanism established at the national level to agree to the execution of the Biodiversity Subcomponent (national group), and Pilot Demonstration</li> <li>Inter-ministerial agreement of the agencies involved in each country to define the representation of the Technical Counterpart of the CIC concerning biodiversity.</li> <li>Reports and minutes of meetings of the national groups.</li> </ul>
Stakeholder involvement	<ul style="list-style-type: none"> <li>Increased awareness of and participation in biodiversity project activities through more than 25 workshops and meetings with local authorities, institutions, and stakeholders.</li> <li>Preparation and wide dissemination of project-related</li> </ul>

Process OUTCOMES	Process INDICATORS
	documentation and project-related activities
Transboundary waters legal framework adopted and/or strengthened	<ul style="list-style-type: none"> <li>Guidelines for an harmonized legal framework in agreement with the CIC</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions	<ul style="list-style-type: none"> <li>Cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>Institutional strengthening (training and equipment) provided to institutions related to the biodiversity.</li> </ul>

### STRESS REDUCTION OUTCOMES AND INDICATORS

Stress Reduction OUTCOMES in Pilot Demonstration (PD)	Stress Reduction INDICATORS (report vs. baseline if possible)
Reduction in the fishing stress rate due to implementation of the management plan Fishermen working in alternative activities during fishing preclusion periods	Income increase of the fishermen, measured in monetary values).

Environmental/Water Resources (& Socioeconomic) Status OUTCOMES for Pilot Demonstration (PD)	Environmental/Water Resources (& Socioeconomic) Status INDICATORS
PD Biodiversity Environmental health and socio-economic wealth	<ul style="list-style-type: none"> <li>- Increased aquatic biodiversity and population, measured in number of species and population</li> <li>- Increase in fisherman incomes measured in monetary values</li> </ul>

Annex 1: Location map

- Framework Program for the Sustainable Management of the Water Resources of the La Plata Basin -

**Priority Projects and Pilot Projects Location**



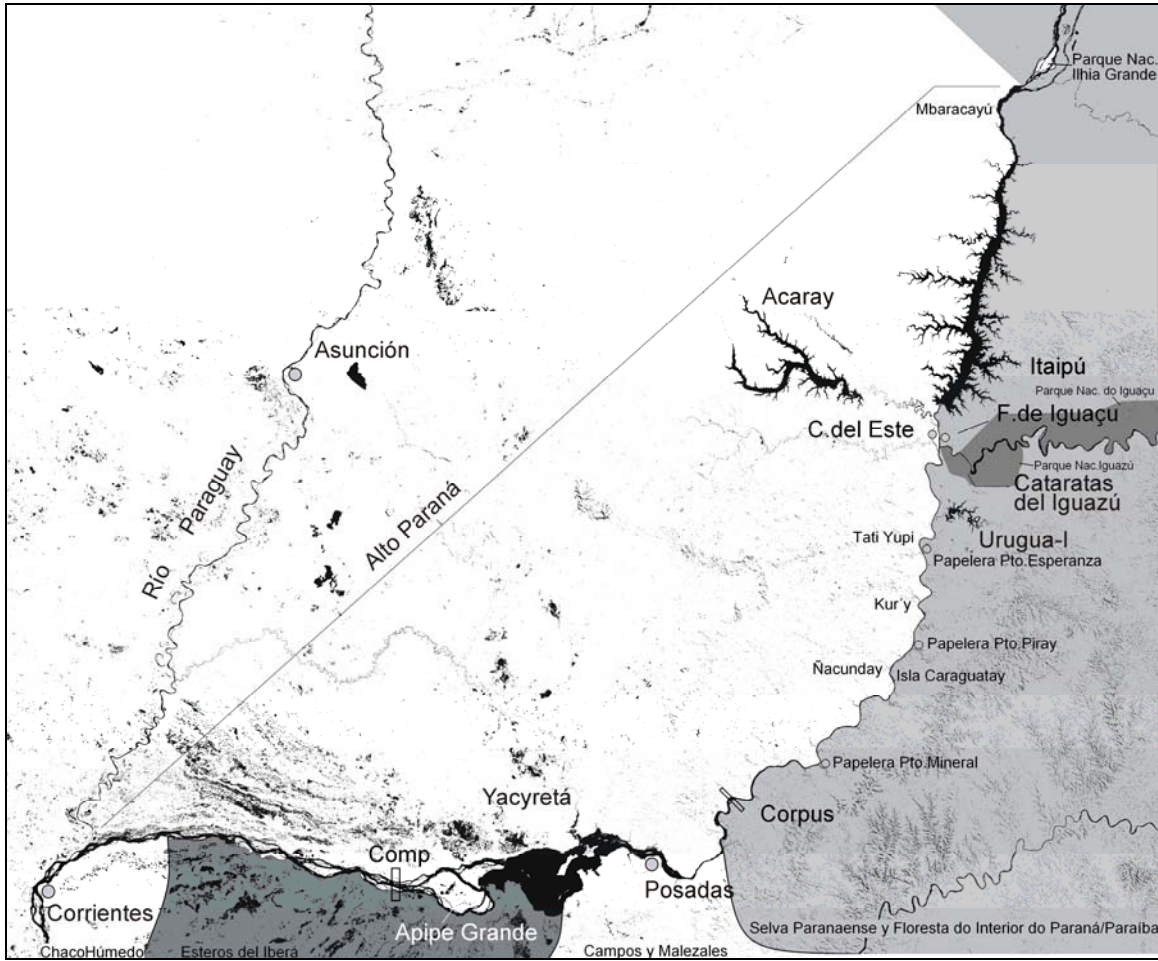


Figure 1. Study Area

## Annex 2 Timetable

Activity/Sub-Activities	Year 1						Year 2						Year 3					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
<b>Activity 1. Coordination and execution arrangement</b>																		
<b>Activity 2.-Ichthyic fauna and its habitat</b>																		
Determination of critical aquatic habitats for fishes																		
Characterization of aquatic biodiversity (types of species, estimated fish population)																		
Study on the migration of fishes																		
Determination of the environmental parameters and calibration of simulation models																		
The golden mussel and its relation with ichthyic fauna																		
Simulation of habitat under different hydro climatic and management scenarios																		
Determination of demographic parameters of fish population																		
<b>Activity 3. Socio-economic and legal framework</b>																		
Characterization of fishing activities																		
Harmonization with legislation																		
Training of participating stakeholders																		
<b>Activity 4. Management Plan</b>																		
Prepare the preliminary management plan																		
Proposal of final management plan																		
<b>Activity 5. Monitoring and evaluation</b>																		

## Annex 3 – Logframe

It should be noted that the baseline will be established within the first six months of project implementation.

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>MAIN OBJECTIVE</b></p> <p><i>Biodiversity conservation in the Parana River River trough the protection of the river ecosystems and costal wetlands while promoting sustainable fishing and controlling exotic species</i></p>	<p>Biodiversity conservation planning process in place and relevant conservation actions tested in the Regulated Parana River, including the Itaipu and Yacyreta dams in Argentina, Brazil, and Paraguay through the execution of the Pilot Demonstration Project (PDP). The PDP, building on a multi-stakeholder participatory approach, will focus on the protection of the river and coastal wetland ecosystems and ensure sustainable management of the ichthyic resources and exotic species. A replication strategy will be formulated for up scaling throughout the La Plata River Basin (LPRB). Documented practices will be used as inputs for the formulation of the SAP.</p>	<p>- Agreed strategic good practices and lessons learned on biodiversity conservation with special emphasis on the sustainable management of the ichthyic resources and control of the exotic species by Y3.</p> <p>- Documented practical hands-on type and participatory experiences to protect the biodiversity of the regulated Parana River and its coastal wetlands at the end of the 3rd. Year.</p> <p>- Replication strategy as input to the SAP.</p> <p>- Documented records with respect to communication and dissemination of the PDP experience in the framework of the LPB Framework Program and worldwide by the end of the PDP execution (3rd. Year).</p>	<p>- Agreed and documented strategic good practices and lessons learned for river and coastal wetlands biodiversity conservation available on the Project website.</p> <p>- Final report of the PDP local experience available on the project Website and with the EA and IA. Such report will include local stakeholder's agreement to sustain the execution of the proposed strategic actions for biodiversity conservation.</p> <p>- An assessment report of the experience developed with a replication strategy and recommendations to upscale the experience to the LPRB, available on the project website.</p> <p>- Strategic actions for river and coastal biodiversity conservation properly incorporated into the SAP.</p> <p>- Dissemination of the PDP experience in the 5 countries of the LPRB, and world wide, building on IW:LEARN dissemination functions including the international Conferences of the GEF.</p>	<p>- The extent of the LPRB hydrological system requires coordinated capacity for actions to address transboundary issues such as the conservation of the river and coastal wetlands biodiversity. Such a challenge can be best addressed by testing practices including feasibility and costs in a critical area characterized by regulated flows due to two major dams. Although the pilot project covers only 3 countries of the LPRB, biodiversity conservation is a critical issue for the whole basin. At present the basin as a whole does not have a clear strategy for biodiversity conservation. Different national and binational actions are under execution without a common Basin strategy. It is thus anticipated that the riparian countries will built on the experience generated and replicated throughout the basin making use of the demo learning which will be incorporated in the Basin SAP.</p> <p>- The risks for the execution of the PDP are very low because of the high interest of all involved parties.</p>



				<p>-Advancing the projects goals depends on institutional efforts and cooperation with donors.</p> <p>-The scale of the pilot project, the differences between various fishing cultures, and the difficulty of harmonizing legislation all require special attention.</p>
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List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>PURPOSE</b></p> <p><i>A participatory replicable pilot demonstration project (PDP) to promote local management experience for biodiversity conservation in the Regulated Parana River prepared, including a Management Plan to preserve aquatic resources.</i></p>	<p>- Through a comprehensive participatory process, the PDP will execute a series of local strategic activities, and will formulate a replicable Environmental Management Plan for Biodiversity Conservation (EMPBC) in the Regulated Parana River.</p> <p>- Creation of a tri-national legal regulatory frameworks for biodiversity conservation and for sustainable fishing management.</p> <p>- Consensus building throughout the PDP execution between key stakeholders in all 3 countries involved.</p> <p>- CIC agreement with national, sub-national and local institutions for the conduct of the PDP and for the establishment of a Tri-national Executive Council, including the bi-national authorities of the Itaipu and Yacyreta dams.</p>	<p>-By the 3<sup>rd</sup> year, agreed EMPBC by local stakeholders and by the tri-national Executive Council for the conservation of aquatic resources: biodiversity monitoring, sustainable fishery management including recommendations for rehabilitation and protection of riparian wetland corridors.</p> <p>- Agreed Bio-geo-physical and socio-economical assessments and proposals to improve the existing legal/regulatory framework and binational agreements for transboundary conservation of ichthyic resources, and to control exotic invasive species. Y1 Q4 through Y3 Q4.</p> <p>- Established and operational Tri-national Executive Council including local institutions, stakeholders and research entities, to coordinate the</p>	<p>- EMPBC available on the project website including minutes of official meetings ratifying the Management Plan.</p> <p>- Bio- geo-physical and socio-economic assessment including inter alia info about:</p> <ul style="list-style-type: none"> <li>• River, coastal wetlands and reservoirs ecosystem;</li> <li>• Ichthyic species (both native and exotic) behavior and fishing;</li> <li>• Social and economical sectors involved in biodiversity resources uses</li> <li>• National and regional legislations available on the project website.</li> </ul> <p>- Minutes of meetings having ratified the agreement signed between the SG/CIC and local institutions, stakeholders and research entities for the creation of the Tri-national Executive Council.</p>	<p>-The national, sub-national and local institutions and stakeholders are showing interest in supporting the PDP and applying the lessons learned</p> <p>- There is a critical need for concerted tri-national management actions for the protection of the riverine biodiversity and coastal wetlands hence for the formulation of a joint management framework.</p> <p>- Adequate national representation is observed.</p> <p>-Commitments made by local players in the preparation of the Pilot Project are honored</p> <p>-Local civil society will support the project and implement its findings</p> <p>-Itaipu Binational and Yacyreta Binational continue their technical support for the pilot project</p>

	<p>-Creation of management team, hiring of a PDP Technical Coordinator.</p> <p>- Coordination between local representatives and national institutions.</p> <p>-Insertion of findings into the framework project, coordination with international technical management.</p>	<p>execution of the PDP and advice the local Technical Coordinator and the CIC. During the first 6 months of the PDP execution.</p> <p>- Technical Coordinator hired by the end of the second month.</p> <p>- First group of consultants and subcontractors selected and hired by the end of the 4<sup>th</sup> month.</p> <p>-Meetings and training workshops between local civil society organizations, government agencies, dam operators, and project representatives to discuss project progress and implement sustainable solutions.</p> <p>- Monthly meetings and workshops key with institutional stakeholders and the technical coordinator</p>	<p>- Aid-memoire and recommendations for the PDP execution coming from quarterly meetings of the Tri-national Executive Council.</p> <p>- Report for the selection process with respect to the recruitment of the Technical Coordinator available on the project website.</p> <p>- Technical Coordinator and consultant contracts available on the project website</p> <p>-Lists of the meetings and workshop's participants, and technical reports prepared with recommendations and conclusions made available of the project website.</p> <p>- Monthly meetings and workshops, list of participants and meeting reports made available on the project website.</p>	<p>-Universities, research institutes, and government will actively participate.</p> <p>-Local institutions make work space available for coordinator and consultants.</p> <p>- Co-financing from FONPLATA is available and coordinated under the CIC.</p>
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List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Activity 1</b></p> <p><i>Ichthyic fauna and its habitats assessment in the Regulated Parana River</i></p> <p><i>Formulation of measures to control exotic species</i></p>	<p>- Evaluation of ichthyic biodiversity in critical habitats. Measures to control exotic species formulated. Habitat modeling in the Regulated Parana River zone.</p> <p>- Analysis of</p>	<p>-Assessment of Parana basin critical aquatic fish habitats and effects of environmental contamination on fish population by Y3, Q3.</p> <p>- Database &amp; GIS system by Y3, Q3.</p>		<p>-Local expertise will be available for conducting scientific studies</p> <p>-Golden mussel is the most important invasive species in the project area</p> <p>-Ecological models</p>

	<p>environmental contamination and fishing on river ecosystems, reservoirs, and wetlands</p>	<ul style="list-style-type: none"> <li>- Biodiversity and fish population inventories including a study of golden mussel and their impact on native species by the end of the Y1 with the inventory and behavior of existing exotic species by the end of Y2.</li> <li>- Study of fish migrations and habits.</li> <li>-Assessment of demographic parameters of fish populations.</li> <li>- Design and calibration of ecological models of fish migration, fish populations, contamination effects on fish population, and invasive species proliferation Y2, Q3.</li> <li>-Simulations of habitat and population changes under various hydro-climatic and management scenarios by Y3 Q1.</li> <li>- Monitoring program to locally manage and control exotic species during Y3, Q1.</li> <li>- National teams dealing with biological issues and ecosystem conservation established and meeting three times a year.</li> </ul>		<p>will accurately depict potential changes in biodiversity</p>
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List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Activity 2</b></p> <p><i>Socio-economic study, educational initiatives, and legal framework for biodiversity conservation completed.</i></p>	<p>-Socio-economic study of human interventions in fish ecosystems, use of natural resources, and the impact of human interventions on local ecosystems</p> <p>-Training and educational programs, based on the socio-economic studies, to increase public participation and knowledge.</p> <p>-Studies of current legislation combined with socio-economic study to harmonize international biodiversity legislation.</p>	<p>-Socio-economic analysis of recreation and commercial fishing and their effect on fish populations by Y2, Q3.</p> <p>-Analysis and harmonization of current national and regional legal and regulatory frameworks by Y3, Q2.</p> <p>-Educational and training workshops for fisherman and local government officials.</p> <p>- Alternative employment for fishermen during low seasons.</p>	<p>-Diagnostic reports of fishing activities, databases of all surveys and analyses completed by Y2, Q3</p> <p>- Document proposing adjustment to the current legal national and regional regulatory framework available on the project website and used as an input for the TDA and SAP formulation.</p> <p>- 3 legal and scientific documents (one for each country) including locally agreed environmental management measures and biodiversity protection measures for the regulated Parana River, including regulations for sustainable fishery and control of the exotic species available on the project website and used as input for the TDA and SAP formulation.</p> <p>- Documented capacity building actions for the enforcement of the legal agreements to manage in a sustainable way the fish resources, and the exotic species available on the project website.</p> <p>- Records of capacity building workshop (9) including reports, lists of participants and manuals available on the project website.</p> <p>- List of alternative activities and possible</p>	<p>-The fishing sector in each of the participating countries (3) has interest in coordinating common responses to sustainable fishing management and for the protection of ecosystems.</p> <p>-Fishing is an economically viable activity and can be practiced sustainably</p> <p>-Itaipu Binational and Yacyreta Binational will provide information, logistical support, and technical knowledge in support of the project</p>

			employment for fishermen available on the project website.	
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List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Activity 3</b></p> <p><i>Environmental Management Plan for Biodiversity Conservation (EMPBC) for the regulated Parana River prepared</i></p>	<p>- Environmental Management Plan prepared and used by local stakeholders in order to protect the environment and improve socio-economic conditions of riparian communities.</p> <p>-The plan will contain the following:</p> <ul style="list-style-type: none"> <li>• identification of key stakeholders,</li> <li>• technical guidelines and criteria for the conservation of ichthyic biodiversity,</li> <li>• incentive programs for sustainable fishing,</li> <li>• A regulatory framework for sustainable fishing and exotic species control.</li> </ul>	<p>- An agreed Environmental Management Plan (EMPBC) completed, published and disseminated by Y3, Q4 with a first draft shared with stakeholders by Y2, Q1.</p> <p>- Preparation of the GIS and database of social, economic, and ecological data for the regulated Parana River and coastal wetlands by Y2</p> <p>- Proposals for the sustainable operation of dams in the basin including flood management responses and biodiversity conservation measures by Y2.</p>	<p>-Draft and final <i>EMPBC</i> available on the project website. Minutes of meetings validating the various draft of the document available on the project website.</p> <p>- Database and GIS available to communities via internet.</p> <p>- Proposals for dam operations and necessary adjustments available on the project website and Minutes of meetings validating the proposals available on the project website.</p>	<p>-It is possible to define, in a participatory manner, and within the framework of the CIC, a tripartite strategy with the support and interest of institutions and local stakeholders for the conservation of biodiversity and the protection of ecosystems</p> <p>-Sustainable fishing is viable based on agreements reached between the 3 countries</p> <p>-It is possible to control the expansion of exotic species to protect ecosystems, and infrastructure.</p> <p>-There exists scientific and technical knowledge as well as sufficient information to support the preparation of an <i>EMPBC</i> that will protect ecosystems, ensure sustainable fishing practices, and support efforts to control exotic species.</p>

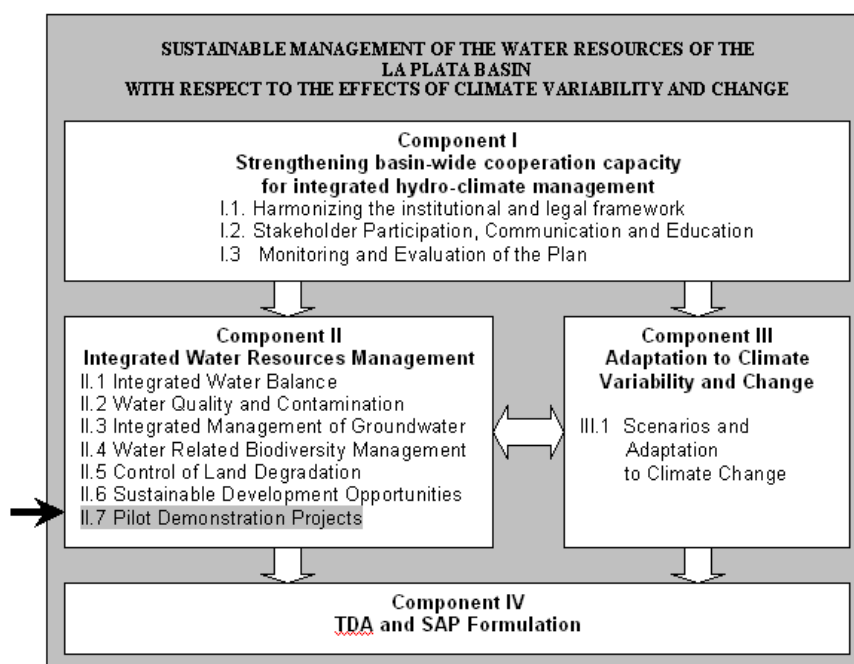
List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Activity 4</b></p> <p><i>Monitoring and evaluation of PDP project completed.</i></p>	<p>-Adequate and timely project financial and substantive monitoring in accordance with the project detailed implementation plan and, monitoring and oversight plan.</p> <p>- Replication strategy for the PDP within the la Plata River Basin and for uptake in the context of the SAP formulation.</p> <p>- M&amp;E reports that incorporate both the monitoring of project progress and the evaluation of execution and possible replicability.</p>	<p>- PDP Monitoring and oversight plan as well Implementation plan as an element of the overall Plata project M&amp;E system by Y1 Q1.</p> <p>- Timely preparation of reports in accordance with the implementation plan and monitoring and oversight plan of the PDP</p> <p>- Documented replication strategy and records of its use in other parts of the Plata Basin. Use of the Replication strategy as input in the formulation of the SAP.</p> <p>- Documented Lessons learns and best practices used in the formulation of the SAP.</p> <p>- Records of the preparation and conduct of the mid term and final evaluation including project management response to the midterm review.</p>	<p>- Implementation Plan as well as Monitoring and Oversight plan for the PDP M&amp;E Plan available on the project website and duly incorporated in the Plata Basin M&amp;E system.</p> <p>- Monthly, quarterly, half year and yearly substantive and financial reports available on the project website.</p> <p>- Documented evidence of LL/ PB and key elements of the replication strategy incorporated into the SAP.</p> <p>- Mid term and final evaluation documents and project management response available on the project website.</p>	<p>-Lessons learned and recommendations for replicability and sustainability of the project will be identified</p> <p>-Project is replicable in other areas of the Plata Basin.</p>

**SUBCOMPONENT  
II.7  
Pilot Demonstration Projects**

**Working Element II.7.2  
Pilot Demonstration to Develop a “Hydro Environmental Alert System”  
Floods and Droughts in the Confluence Area of the Paraguay and Paraná Rivers**

**Part 1: Project Identifiers**

- 1.1 Sub-project title: Pilot Demonstration to Develop a “Hydro Environmental Alert System” - Floods and Droughts in the Confluence Area of the Paraguay and Paraná Rivers
- 1.2 Link to umbrella project: Component II: Integrated Water Resources Management  
II.7 Pilot Demonstration Projects



1.3 Geographical scope:

The area of influence of the project is defined by: (i) localities along the Paraguay River (up to the city of Asunción); (ii) localities along the Paraná River (up to the Yacyreta Dam) and; (iii) by the confluence of the Paraná and Paraguay rivers to the cities of Corrientes and Resistencia. Also the province of Formosa, the Tobicuary river, the Bermejo river (80 km upstream up to Colorado), and strategic points in the Iguazú river (due to the rapid response time of the river - approximately 7 days to Resistencia) are included. See Map in Annex 1.

1.4 Executing Agency/entity: -CIC in cooperation with the following national institutions:

- Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.
- Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.
- Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).
- Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.

1.5 Duration: 3 years

1.6 Focal area(s): IW

1.7 GEF grant:	US\$ 220,000
1.8 Co-financing:	US\$ 988,000
1.9 Total funding:	US\$ 1,208,000
1.10 Associated financing:	None
1.11 Contact person:	
Name:	Miguel Angel López Arzamendia
Title:	CIC Secretary General and Project Director
Tel:	(54-11) 431 22 506
Email:	<a href="mailto:secretaria@icplata.org">secretaria@icplata.org</a>

**1.12 Project summary:** The subcomponent objective is to improve the capacity to forecast, communicate and act upon the occurrence of extreme hydrological events and spills (contamination) in the metropolitan areas of Resistencia, Corrientes and Pilar. The outcome is a simulation hydro-environmental alert system model predict floods, droughts and contamination spills, and contingency plans take into account safety guidelines in hydro-regulation structures, operationalized in project-year 3. The Pilot Demonstration is subdivided into 7 main Activities, to be developed in three years. The goal of the “Pilot Demonstration for a Hydro Environmental Alert System” Floods and Droughts at the confluence of the Paraguay and Paraná Rivers” (PD-Hydro Environmental Alert System) is thus to mitigate damages and losses caused by extreme hydrological events and/or spills (contamination) on the population and environment.

#### Summary Table of subcomponent Work Elements, Output and Outcomes

Work Element	Output	Outcome
II.7.2 Hydrologic alert system pilot	Pilot Demonstration: Hydrologic alert system at confluence of Paraguay and Parana Rivers	A simulation hydro-environmental alert system model predict floods, droughts and contamination spills, and contingency plans take into account safety guidelines in hydro-regulation structures, operationalized in project-year 3

#### Summary Table of subcomponent Work Elements, Sources of Funding, and Costs

Activity	Sources of funding						Total Cost (US\$)
	GEF		FONPLATA		Counterpart		
	(US\$)	%	(US\$)	%	(US\$)	%	
1. Coordination	30,000		57,600		0		87,600
2. Development of an Operational System for Hydrological Observation and Forecasting	90,000		72,400		143,000		305,400
3. Development of an Operational System for Contaminant Spill Modeling	112,000				68,000		180,000
4. Development of a Decision Support System (“Binational Hydro Environmental Alert System”).			111,000		92,000		203,000
5. Development of Contingency Plans			80,000		58,000		138,000
6. Support projects and studies.			79,000		108,000		187,000
7. Monitoring and evaluation	18,000				89,000		107,000
<b>TOTAL</b>	<b>220,000</b>	<b>15%</b>	<b>400,000</b>	<b>30%</b>	<b>588,000</b>	<b>55%</b>	<b>1,208,000</b>



## **Part 2: Project design**

### **2.1 Background and context:**

**Background and introduction** *Risks related to the climate variability and change.* The “Pilot Demonstration for a Hydro Environmental Alert System at the confluence of the Paraguay and Paraná Rivers” (PD-Hydro Environmental Alert System) is located in one of the highest flooding risk prone areas in La Plata Basin due to extreme hydrological events. The problem is increasingly worsening with uncontrolled land use expansion.

The main threat addressed by the GEF Project refers to the catastrophic effects of floods caused by climate variability at the confluence of the two main rivers of the la Plata basin, Paraguay and Paraná. The project will contribute with improved knowledge of transboundary critical issues related to hydrological extreme events, contingency planning and water quality.

As shown on Figure 2 the city of Resistencia (Chaco) is the first city to receive the impact from extreme hydrological events downstream of the confluence of the Paraná and Paraguay rivers. The city has historically been very vulnerable to flooding from multiple causes: the rivers Paraná, Paraguay, Negro and Neembucu; intense rainfall events; urbanization related to the increasing impermeable areas (the land surface in small urban basins usually consists of roofs, streets and others impervious material). Additional impacts include proliferation of water born diseases due to flooding of contaminated waters.

These extreme events tend to increase frequency and magnitude affecting large urban, wetlands, and agricultural areas of great economic and strategic importance. In the area of Gran Resistencia, after the large flooding of 1982/83, which lasted 11 months, defence systems were built to provide protection from the floods. Diversion channels and 29 metropolitan lagoons were also built and maintained in order to help control the water levels and to provide additional defence against flooding for the local residents. Since 1998 land use has been regulated based on risks to extreme rainfall and flooding of the Negro river.

In Paraguay, a great portion of the population along the rivers is very vulnerable to extreme hydrological events. Cities along both the Paraguay River (and tributaries) and the Paraná river such as Bahia Negra, Concepción, Asunción, Alberdi, and Pilar are very vulnerable to floods. These areas include thousands of families that were displaced (having to abandon their properties), and are living in poverty on the outskirts of towns and cities in the region, in many cases subject to very unsafe sanitation and health conditions.

The annual flooding and intense rainfall has a dramatic impact on the livelihood of the farming communities and can often lead to devastating crop losses. There is increasing fear that the magnitude of these flood events may increase due to El Niño effects and they may also become more frequent.

The media (TV, radio, newspaper, magazines, etc.) can play a key role, however, currently it is not well exploited.

The El Niño in 1997-98 left in Paraguay a great lesson: it's absolutely necessary to pay attention to hydrological and climatological forecasting.

The flooding of 1982/83, 1992, 1995, 1997 and 1998 caused by the extreme increase in the levels of the rivers Paraná, Paraguay, and Uruguay, associated to the El Niño, heavily punished the seven provinces of the Litoral –Mesopotamia region of Argentina: Buenos Aires, Corrientes, Chaco, Entre Rios, Formosa, Misiones and Santa Fe. Each of these floods originated from different rainfall patterns in one or more of the bordering countries (with exception of the precipitation in 1997/98 which occurred entirely on Argentine territory).

In many cases the flooding are aggravated when there isn't an urban drainage system or when the existing system is filled with garbage and sediments. Lack of appropriate refuse collection and disposal decreases water quality and waste material clogs the urban drainage network.

The region of Resistencia-Corrientes, just downstream the confluence of the Paraná and Paraguay rivers, is heavily hit by the extraordinary increases in river levels (which originate mainly from Paraguay and Brazil). Historical records from the last 200 years indicate huge flows in the Paraná River (at Resistencia-Corrientes) like in 1812 (58,000-62,000 m<sup>3</sup>/s); 1858 (51,000-54,000 m<sup>3</sup>/s); 1878 (47,000-50,000 m<sup>3</sup>/s); 1905 (47,000-49,000 m<sup>3</sup>/s); 1966 (41,000-42,000 m<sup>3</sup>/s); 1977 (34,000 m<sup>3</sup>/s); 1982/83 (60,000 m<sup>3</sup>/s); 1991/92 (54,000 m<sup>3</sup>/s) and; 1997 (42,000 m<sup>3</sup>/s). The longest flood duration occurred in 1982/83 (11 months).

Since 1970 the frequency of flooding increased to approximately one every four years. The increase is correlated to the El Niño phenomena, land use changes, and increase exposure of new developments to high risk flood areas. Flood losses can be quite significant. For example, the estimated losses for the Paraná river were: US\$ 750 million in 1966, US\$ 1.8 billion in 1982/83, and US\$ 1.75 billion in 1997/98.

The World Bank provided financial support to repair the losses caused the floodings of 82/83 and 97/98 in the Litoral and Mesopotamia region. However, it is recognized the lack of protection in other urban and rural areas.

The wetland areas of Neembuco and the agricultural areas in the Pilar region in Paraguay have gravely been impacted by flooding causing isolation of areas, disruption of production, and displacement of the population. The Japanese International Cooperation Agency (JICA) and the government of Paraguay started in 1997 structural flood control measures to mitigate impacts including physical control of basin drainage, by means of dikes, channel, canalization, and planting forests. Some of the works were efficient others, require further studies (including interaction with the aquifer) especially in the sensitive wetland areas.

There is great need to define flood zoning linked to a real time flood forecasting system (and considering existing protocols from Civil Defense Authorities). Related actions include: (i) definition of an alert system: mathematical model, forecasting range and alert steps; (ii) strengthen the County Civil Defense Authority, so as to be prepared to act, with well pre-established plans, during the floods and ; (iii) preparation of emergency plans for the different parts of the city. The forecasting conditions include watch conditions, alert conditions, and emergency conditions.

*Risks of accidents (spills) and water quality contamination.* The impacts of an accident (spill) in the water quality (contamination) in the area of influence of the Hydrological Alert System, at the confluence of the Paraguay and Parana Rivers (PD-Hydrologic Alert System), is a critical issue for the effective environmental management and application of contingency plans.

Currently there isn't a Spill Alert Centre where the contamination of a certain product and location can be communicated - and the technological capacity to quickly model (simulate) the extension and magnitude of the contamination plume, to determine the need to apply contingency plans.

Water quality problems originate from several sources including: (i) inadequate use of agrochemicals; (ii) farming activities and agricultural industry; (iii) inadequate treatment of residual waters (domestic and industrial); (iv) heavy metals from mining activities; (v) inadequate management of dangerous substances; (vi) nutrients in water bodies; (vii) inadequate disposition of solid wastes on flood basins and; (viii) inadequate management of wastes during transportation.

Accidents (spills) occurred in the area of influence of the project and it is essential to have capacity to model impacts and the need to apply emergency measures. Additionally, there isn't in the area of influence of the PD-Hydrologic Alert System an agreed common plan for exchange of information on contamination. The countries have been working independently on this theme.

Available information on water quality in the countries includes:

- Argentina has stations operated by provinces, via bi-nationals and tri-nationals (Caru, Pilcomayo, Yacireta, etc.) and the Prefectura Naval. There isn't a coordinated operation at the national level.
- Paraguay has an operational water quality monitoring network, funded by JICA until 2006. It includes 6 stations (32 parameters measured) for the monitoring network of the La Plata Basin.
- Brazil has an operational water quality network, coordinated at the national level with support of state and federal institutions. The monitoring network includes 16 stations (on average 6 parameters measured).
- Bolivia has a network operated by the tri-national of the Pilcomayo. There isn't a coordinated operation at the national level.

In the area of influence of the PD-Hydrologic Alert System chemical, biological, bacteriological, physical-chemical analysis are performed at 6 locations (Bermejo/Paraguay; Paraguay/Parana; Puente interprovincial Resistencia/Corrientes).

Statement of Issue The problem is related to the mitigation of the effects of extreme hydrological events (flooding, drought) and episodes of spillage of contaminants in the Project area, which includes the transboundary area of the confluence of the Paraguay and Paraná rivers.

The flooding of 1982, 1983, 1992, 1995, 1997 and 1998, due to the extraordinarily high waters condition of the Paraná, Paraguay and Uruguay rivers associated with the El Niño phenomenon, have had enormous socio-economic impacts for populations located on the banks of these rivers, including seven provinces in the Littoral regions of Argentina (Buenos Aires, Corrientes, Chaco, Entre Ríos, Formosa, Misiones and Santa Fe) and Paraguay (Bahía Negra, Concepción, Asunción, Alberdi, Pilar, and Encarnación, among others). The city of Resistencia is the first to feel the impacts caused by extreme hydrological events due to its location at the confluence of the Paraná and Paraguay rivers. Consequently, there is a need to improve the management of risks (prevention, contingency and remediation) in the face of extreme hydrological events.

On the other hand, the impact contaminants have on water quality in the Project area is an important issue for effective environmental management and the implementation of contingency plans at the transboundary level. Nowadays, there is not any spill alert center to provide information regarding contamination by a particular product or substance and the location of such contamination; likewise, there is not any local technical capacity to model the extent and magnitude of the contamination, and evaluate the need for applying contingency plans.

2.2 Subcomponent objective The objectives of the PD-Hydro Environmental Alert System are to improve the capacity to forecast, communicate and act upon the occurrence of extreme hydrological events and spills (contamination) in the metropolitan areas of Resistencia, Corrientes and Pilar. The system should promote development of future information exchange agreements between the countries.

A monitoring and alert system for irrigation management (prevention, contingency and rehabilitation) in the metropolitan axis of Resistencia-Corrientes (Argentina) and Pilar (Paraguay) is envisioned. It contemplates adaptations/actions to address the hydrological effects of climate variability and change, to prevent flood and drought-related disasters and implement mitigation actions in partnership with Civil Defense authorities. The alert system contemplates notifications of extreme hydrological events, contaminant spills and preparation of contingency plans. It also contributes to improved knowledge of transboundary critical issues related to hydrological extremes, contingency planning and water quality.

To meet the objectives the main tasks include:

- a) To update, strengthen, and integrate the current hydro environmental alert systems and community management systems to predict extreme hydrological events and occurrences of contaminant spills;
- b) To develop community contingency plans including social participation and transboundary integration;
- c) To simulate various hydrological scenarios in order to plan and develop quick and efficient response mechanisms for different risk levels;
- d) To promote institutional strengthening and
- e) To strengthen local capacity.

2.3 Environmental benefits The major environmental benefits of this Pilot Demonstration are related to increasing legal, institutional and technical capability of the local population to monitor and act upon the impacts of accidental spillages of hazardous material in the upstream portions of the basin, specially regarding the water quality (contamination) in the area of influence of the Hydrological Alert System, at the confluence of the Paraguay and Parana Rivers (PD-Hydrologic Alert System).

The Alert System will also contribute to the adaptation of the local population to the impacts of climate variability in the short term and climate change in the medium and long term, through the development of scenarios and the application of lessons learned from adaptation initiatives in other areas. The area has additional pressures that will be addressed by this pilot project, such as the deterioration of forests and soils, the quality of water resources, and the fragmentation and destruction of the wetlands corridor and aquatic biodiversity. In the La Plata basin, for its dimension, the transboundary water resources interlink all this issues, which will thus benefit from this project.

The continuous improvement of scenarios and of the adaptation capability will allow regional and urban planners to better design infrastructure and economical activities within a framework of environmental protection and sustainability.

2.4 Overall sub-component Outcomes The general outcome is a simulation hydro-environmental alert system model predict floods, droughts and contamination spills, and contingency plans take into account safety guidelines in hydro-regulation structures, operationalized in project-year 3. The PD-Hydro Environmental Alert System will include:

- a. A Bi-national (Argentina and Paraguay) Hydro Environmental Alert System for risk management (prevention, contingency and rehabilitation) using simulation models to predict floods and droughts as well as contamination risks caused by spilling;
- b. Adaptations/actions to address the hydrological effects of climate variability and change, to prevent flood and drought-related disasters, and implement mitigation actions. Flood maps will be generated for different scenarios of climate change;
- c. Provisions for immediate notification of extreme hydrological events, contaminant spills and preparation of contingency plans, in partnership with Civil Defense Authorities according the rules in each country;
- d. Improved knowledge of transboundary critical issues related to hydrological extreme events, contingency planning and water quality. It will also take into account safety guidelines in hydro regulation works (dams) and
- e. Creation and implementation of a Transboundary Water Alert Committee.

2.5. Consistency of the sub-project with national/regional priorities and plans:

### **ARGENTINA**

Argentina is the only country belonging to La Plata Basin that has a Hydrological Alert System in its territory. The Water National Institute, (INA) connected to the Water Resources Under-secretariat (SSRH) is responsible for the development and operation of the Hydrological Alert System of La Plata Basin. The information is provided by the Prefectura Naval which realizes two daily hydrometrical measurements in its 82 stations belonging to the National Directorate of Waterway.

The Hydrological Alert System of the Paraná and Paraguay rivers is efficiently done by the National Water Institute – INA. The National Water Resources Under-secretariat (SSRH) has a hydrological network around the country, which does not work in real-time, limiting the use of the Hydrological Alert System.

The Binational Bermejo River Commission (COBINABE) had implemented a Hydrological Information System (SIH) in the Bermejo River Basin with the aim of concentrating the hydrological data for storage, evaluation and diffusion in real time.

The Naval Hydrographic Service operates a hydrometric network with 4 stations to forecast the La Plata river levels and a pluviometric network with 2 stations Oyarbide and Isla Martín García, in the Río de la Plata. The National Directorate of Waterway has a tidal monitoring network controlled by Hidrovía SA, with 24 measuring stations.

The National Meteorological Service can provide extensive rainfall information.

The Pilcomayo River Basin is remarkable because of its critical contaminant levels arising from old mining activities. Strong sediment charges have produced a recession of more than 70 km in its confluence with the Parana River. The European Union is cooperating to elaborate an integrated management and master planning project and implementation of a water quality monitoring network in the Pilcomayo River.

The Bermejo River has a similarly high level of sediment production, transporting more than 70% of the sediments to the Parana River at Corrientes, Argentina, which affects the waterways and channels in the ports of Buenos Aires and Montevideo. The GEF has supported the Binational Commission in implementing a Strategic Action Plan (SAP Bermejo) to address the anthropogenic portion of this erosion, sustainable development and water resources management in an integrated way.

The Yaciretá Binational Entity (YBE: Argentina – Paraguay), the Itaipú International (Itaipú Binational Entity: Brazil – Paraguay), and agreement program such as COMIP (Mixed Commission on the Medium Paraná) can provide excellent data on water quantity and quality.

## **PARAGUAY**

The entire country is located in La Plata Basin. There are 2 national Institutes in charge of the monitoring, storage and diffusion of the hydrometeorological information. The Meteorological and Hydrological Institute provides meteorological forecast mainly for the aviation and for the public in general. It is the national technical institute affiliated to OMM.

The National Navigation and Ports Administration (ANNP), has 22 hydrometric stations to control the navigation of the Paraguay River. In addition, ANDE (National Electricity Administration) generates useful hydrometeorological data. Furthermore, Itaipu has a real hydrometeorological data in Paraguay. It is automatized with satellite data transmission.

## **BRASIL**

On the Brazilian side of La Plata Basin there isn't a systemized program for observation and measurements of floods. In some sections of the Paraná river the flood alert are based on the river water level or in the short term meteorological forecast, like in the lower Paraná River, the Pantanal, Paraguay and Iguazú rivers.

The meteorological centers of the states together with the Meteorological Federal Agencies (CPTEC, INMET) inform the Municipal civil defense the alert and decisions taken.

In the city of Sao Paulo City, there is a flood alert system (SAISP), based on meteorological radar, and which works together with Emergency Management Center of Sao Paulo (CGE). It is controlled by the Water Technological Center Foundation (FCTH), generating reports on rainfall and impacts, every 5 minutes. The hydrological monitoring of the SAISP is performed by the Water and Electric Power Department of the State of Sao Paulo (DAEE) and by radar.

In the Brazilian side of La Plata Basin the pluviometric network has 694 station and the 433 hydrometric stations. The National Water Agency (ANA) controls a telemetric network of automated pluvio-hydrometric stations together with CPTEC. The network is composed by 52 stations and provides measurements of the precipitation and river water levels every hour.

Another example of Hydrometeorological Alert system in Brazil is the Technological Institute SIMEPAR, ex-Metereological Service of the State of Paraná. It is a private entity that provides meteorological, environmental and hydrological data forecast. It also forecasts extreme events with emphasis in the impacts on the hydropower sector.

## **BOLIVIA**

The problem is that there isn't any specialized institution to perform hydrological forecasts in the region. According to a research realized by GEF in 2002, the information exchange by the hydrological station of the country is neither permanent nor periodic at national or international level.

Besides SENAMHI there are other institutions the provide data but the exchange among them is null. In the Bermejo basin, PEA Bermejo Project has established a network which provides real time data to a center in Salta, Argentina and Tarija, Bolivia. In the Pilcomayo basin there is a hydrological monitoring project

In summary in Bolivia there isn't any strategy to exchange hydrological forecast information, because they are not performed in a systematic way and the information management is very

### 2.6 Consistency of the sub-project with the GEF strategies and its strategic programmes:

This project is important from the stand point of building synergy between the countries related to the actions against extreme hydrological events. Joint actions between the municipalities of Resistencia-Corrientes and Pilar will be promoted. The actions will have a strong relationship with the Hydro-Climatic Forecast System for the la Plata Basin, creating a pilot experience to verify the implementation of the systems developed for the whole region, in particular the support systems for decision-making. Particularly, adaptation to climate change will be considered, with special consideration of the control of urban development in zones prone to flooding under the future scenarios.

The GEF funding will be used to ensure dissemination of the experience throughout the basin and for the formulation of a mechanism to allow up-scaling of the experience generated, throughout the Plata Basin during the SAP implementation phase.

### 2.7 Coordination and linkages to the umbrella project activities and other related activities in the basin:

El Programa Marco para la Gestión Sostenible de los Recursos Hídricos de la Cuenca del Plata (PMAE), con Relación a los Efectos Hidrológicos de la Variabilidad y el Cambio Climático, tiene el objetivo principal de construir una asociación de esfuerzos para asistir a los Gobiernos de los referidos países en fortalecer su Visión para el desarrollo económico, social y ambientalmente sostenible de la Cuenca del Plata, basado en la protección y la gestión integrada de sus recursos hídricos.

Durante su desarrollo se identificaron áreas piloto donde se consideran los temas transfronterizos críticos, las causas, acciones prioritarias y vacíos de información, propuestos y consensuados por especialistas y coordinadores técnicos del CIC-Plata. La región de Resistencia es una de esas áreas piloto identificadas luego de un proceso de recopilación, análisis y elaboración de la información disponible y de consulta con los especialistas y coordinadores nacionales de las unidades técnicas de los cinco países.

The PD-Hydrologic Alert System is demonstrative of the La Plata Framework Program and should put into practice the general actions developed in Component II Consolidations of Capacities for the Integrated Management – in particular Action II.1. Hydro Climatic Prediction Systems and Adaptation to Hydrological Effects and Variability of Climate Changes.

### 2.8 Incremental reasoning:

Baseline The project contemplates the mitigation of the extreme hydrological events (floods and droughts) and contaminant spills in the area of the confluence of the Paraná and Paraguay rivers, including the metropolitan axis of Resistencia-Corrientes (Argentina) and the city of Pilar (Paraguay).

The floods which occurred in 1982/83, 1992, 1995, 1997 and 1998 on the Paraná, Paraguay and Uruguay rivers, associated to the El Niño, generated great socio-economical impacts in the riverine population, including the seven provinces of the Litoral region of Argentina (Buenos Aires, Corrientes, Chaco, Entre Ríos, Formosa, Misiones and Santa Fe), and several cities in Paraguay (Bahía Negra, Concepción, Asunción, Alberdi, Pilar, and Encarnación, among others).

The city of Resistencia is one of the cities most heavily impacted by extreme hydrological events. There is great need to improve risk management (prevention, contingency and rehabilitation), to define flood zoning linked to a real time flood forecasting system, and to work through the National Under-secretariat, with the Civil Defence Authorities.

The impacts of spills on the water quality are another key issue for an efficient environmental management of the area, and the application of contingency plans. Until the present there isn't an alert center for spills, where it is possible to communicate a contamination due to a spill (product and location), and local technological capacity to model the extension, magnitude, and seriousness of the contamination - to evaluate the necessity of applying contingency plans.

Increment The Hydro-environmental Alert System will improve the capacity to forecast, communicate and act upon the occurrence of extreme hydrological events and spills (contamination) in the metropolitan areas of Resistencia, Corrientes and Pilar. Additionally, it will increase the ability of the affected communities to devise actions to address the hydrological effects of climate variability and change, thus preventing or mitigating flood and drought-related disasters.

Alternative The alternative to the implementation of this Pilot Demonstration would be to continue living with uncertainties and risks of considerable damages caused by floods and droughts, with contingency plans of low credibility, due to the fact that information is scattered through several sources of the three countries, lacking coordination to produce warnings as much anticipated as possible

Incremental reasoning The opportunity of having the three countries working together will allow to overcome serious difficulties arisen from the large basin dimensions and the complex relationships among

environmental and anthropogenic effects of floods and droughts, for the benefit and increased safety of the population in the affected area.

### 2.9 Activities – outputs – outcome:

Subcomponent & Objective Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
Improve the capacity to forecast, communicate and act upon the occurrence of extreme hydrological events and spills (contamination) in the metropolitan areas of Resistencia, Corrientes and Pilar	Hydro Environmental Alert System	0	50% of alert system is in preparation in coordination with interdependent activities	100% alert system operationalized
A simulation hydro-environmental alert system model predict floods, droughts and contamination spills, and contingency plans take into account safety guidelines in hydro-regulation structures, oprationalized in project-year 3	Compliance with PD objectives, budget and timing	0	<p>- Agreements signed between the SG/CIC and national, sub-national and local institutions related to hydro-climatic and hydrological data and information, and with national and local organizations of civil defense, to implement the PDP, by Y1, Q2.</p> <p>Alert system model to predict floods, droughts, and contamination spills available to define possible scenarios and alert system, by Y3, Q2.</p> <p>Joint contingency plans for emergency situations in place by Y3, Q4, based in the cities of Resistencia, Corrientes and Pilar.</p> <p>Institutional agreements signed</p>	<p>- Hydro-climatic prediction and warning system in the three pilot project cities are able to develop a real time flood forecasting system</p> <p>Chemical Spill Alert Center is able to quickly model contamination plumes and determine the need to apply contingency plans</p> <p>-Early warning system is accessible to local populations; contingency plans for potential disasters are available</p>

#### II.7.2 Pilot Demonstration: Hydrologic alert system at confluence of Paraguay and Parana Rivers

*Objective:* Improve the capacity to forecast, communicate and act upon the occurrence of extreme hydrological events and spills (contamination) in the metropolitan areas of Resistencia, Corrientes and Pilar

*Outcome:* A simulation hydro-environmental alert system model predict floods, droughts and contamination spills, and contingency plans take into account safety guidelines in hydro-regulation structures, operationalized in project-year 3

*Output:* II.7.2 Pilot Demonstration: Hydrologic alert system at confluence of Paraguay and Parana Rivers

*Activities:* a) Establish pilot-demo coordination unit

- b) Develop an operational forecasting and hydrological observation model
- c) Develop an operational model for contaminant spill
- d) Develop DSS for a bi-national hydro-environmental alert system
- e) Prepare contingency plans
- f) Prepare hydrological alert system manual and scale-up strategy
- g) Monitor and evaluate activity

Output and activity	Description of indicator	Baseline level	Mid-term target	End-of-project target
II.7.2 Pilot Demonstration: Hydrologic alert system at confluence of Paraguay and Parana Rivers	Hydro Environmental Alert System	0	50% of alert system is in preparation and coordination with interdependent activities	100% alert system operationalized
a) Establish pilot-demo coordination unit	Staff and consultants for implementation of project activities.			A technical unit, under the leadership of a PDP's Technical Coordinator is locally established by Y1, Q1
b) Develop an operational forecasting and hydrological observation model to predict droughts and floods	<p>Improved capacity for hydrological observation and forecasting (to anticipate floods and droughts) which includes: (i) identification of locations and forecasting requirements; (ii) methodology for the elaboration of water risk maps; (iii) improved network operation system; and (iv) social communication and relationships with users.</p> <p>Improved coordination and dissemination of hydrological data.</p> <p>Education programs and workshops to increase local awareness and knowledge on hydrological issues</p>		<p>Identification of locations and forecasting requirements Y1 ,Q2</p> <p>Methodologies for the elaboration of water risk maps by Y2,Q4</p> <p>- Topographical maps and water/risk maps prepared in GIS base for the PDP's area by Y2</p> <p>-Hydrological data transmitted, evaluated and stored in a dynamic GIS system carried out from Y1 Q4 through Y2 Q2</p> <p>- A network training program established by Y3.</p> <p>Training workshops conducted starting Y2, Q1. Reports from workshops, seminars, training sessions are made available</p>	<p>6 Hydro-climatic monitoring stations installed and equipped in strategic points in order to improve regional and local predictions</p> <p>- Final topographic maps of the PDP area and water/risk maps are prepared and available</p> <p>- Hydrological studies conducted Y1 Q2 through Y2 Q3 with results available, identifying the relation between climate variability and climate change with water resources, flow predictions, and regulatory role of wetlands</p> <p>- 6 educational workshops executed (2 in each city), with an average of 30 participants in each. Reports detailing number of participants by institutions and organizations. Printed thematic manuals prepared.</p>
c) Develop an operational model for contaminant spill	<p>- Chemical dispersion model at the Parana and Paraguay river's confluence area</p> <p>Establishment of mechanisms for institutional information exchange, and</p>		<p>- Institutional protocols for information sharing are signed by Y1 Q4.</p> <p>- A center for chemical spill alert is established in Resistencia (Ar), by Y2, Q2.</p>	System for modeling spill plumes is completed and operational, allowing for the preparation of contingency plans, hazard impact assessments, water quality monitoring, and the identification of potential pollution sources to support



	<p>chemical spill alert center in Resistencia, Argentina.</p> <p>Implementation of a local water quality monitoring system</p> <p>Identification of potential sources of chemical disasters</p>		<ul style="list-style-type: none"> <li>- Local water quality monitoring system established by Y1 Q4 through Y2.</li> <li>- Report including an inventory of contaminant sources</li> <li>- Technical report on potential sources of chemical disasters, and related data, is completed by Y3 Q2 to Y3 Q3 and made available to local stakeholders</li> </ul>	<p>planning and decision making processes.</p>
<p>d) Development of the Decision Support System (Binational Hydro Environmental Alert System)</p>	<p>GIS map of vulnerabilities and risks</p> <p>Incorporation of available climate and stream flow information , models and maps</p> <p>Completed graphical user interface</p>		<ul style="list-style-type: none"> <li>- Institutional protocols for information sharing are signed by Y1 Q4.</li> <li>- A center for chemical spill alert is established in Resistencia (Ar), by Y2, Q2.</li> <li>- Local water quality monitoring system established by Y1 Q4 through Y2.</li> <li>- Report including an inventory of contaminant sources</li> <li>- Technical report on potential sources of chemical disasters, and related data, is completed by Y3 Q2 to Y3 Q3</li> </ul>	<p>A functioning system to predict and warn of hydro-climatic emergencies and chemical spills, with centers up and running in the three cities of the pilot project, is completed and operational.</p> <p>Training activities conducted for local organizations, populations, and civil defense in the use of the early warning system</p>
<p>e) Prepare contingency plans</p>	<p>Contingency plans for flooding, droughts, and chemical spills in Resistencia, Corrientes and Pilar.</p> <p>Institutional arrangements for contingency plans at the binational</p>		<ul style="list-style-type: none"> <li>- Technically supported Joint Contingency Plan for floods and chemical spills documented and locally managed at the end of Y3.</li> <li>- Bi-national response team created to manage</li> </ul>	<p>-Emergency contingency plans focusing on local community training and participation has been developed and implemented.</p> <p>Contingency plans for flooding, droughts, and chemical spills are available and endorsed by local authorities and</p>

	level.  Workshops, courses and training programs.		the Joint Contingency Plans by Y3 Q1  - Reports from 3 international workshops, including programs and manuals used and list of participants.  -Institutional agreements signed and Communication Center for early warning established by Y3 Q3.	stakeholders in Resistencia, Corrientes, and Pilar.  International workshops and courses on prevention, preparation, and responses to emergencies completed. Reports of workshops available on-line.  Training program and simulation of catastrophes have been completed  Communication Centre is established and operational.  Mechanisms for participation and communication between countries have been established and/or strengthened.
f) Prepare hydrological alert system manual and scale-up strategy	Strategies to increase public participation in warning system and disaster response  Preparation of alert system manuals		- Populations and areas most vulnerable to flooding are identified Y3 Q1  Studies of vulnerable, critical and sensitive areas, and strategies for public involvement in support of the "Binational Hydro Environmental Alert System" (Decision Support System) are prepared by Y3 Q1 to Q3  - Publications and dissemination of alert system manuals by Y3 Q1 to Q3.	An increased number of local stakeholders in Resistencia, Corrientes and Pilar are involved in warning system and disaster response preparation
g) Monitor and evaluate activity				
The monitoring and evaluation activity will allow measuring how the project will be coordinated and adapted to the reality. The M&E Plan is comprised by two very distinctive Activities: (1) Monitoring of progress; and (2) Evaluation of performance and achievement				
g) Monitor and evaluate activity	-Mechanisms and agreed-upon procedures for institutional monitoring and		-M&E document outlining management structure of the project by Y1 Q1.	- A M&E framework detailing supervisory roles, financial oversight, and coordination of project is developed and

	<p>systematic follow-up of project, including financial accountability.</p> <p>Evaluation of the pilot project's replicability within the la Plata River Basin.</p>		<p>-Document of the M&amp;E's Working Plan prepared, agreed upon, and in operation by Y1, Q2.</p> <p>-Document evaluating the replicability of the project in other parts of the la Plata Basin completed between Y3 Q3 and Q4</p> <p>- Quarterly, midterm, and final reports</p>	<p>implemented</p> <p>-Documents of the Operational Plans and M&amp;E plans are agreed upon and disseminated</p> <p>-Quarterly, semiannual, and annual reports are available. Final report of the pilot project available on-line</p> <p>-Financial reports</p> <p>-Adaptive management practiced documented in progress reports</p> <p>-Documents evaluating the replicability of the project in other parts of the la Plata Basin</p> <p>-Evaluation performance, project results and lessons learned are documented</p>
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## 2.10 Budget:

### Financial Table of the GEF Budget

<i>Work Element</i>		<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Total</i>
1200	Consultants	4,700	4,100	3,200	12,000
2200	Sub-contracts with institutions	4,700	32,000	11,000	47,700
3200	Workshops & training	6,000	5,700	7,200	18,900
4100	Equipments & Supplies	106,000	5,000	6,400	117,400
5200	Publications & documents	12,000	6,000	6,000	24,000
<b>TOTAL GEF</b>		<b>133,400</b>	<b>52,800</b>	<b>33,800</b>	<b>220,000</b>

### Co-financing

<i>Source</i>	<i>Type</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Total</i>
Project Governments Contribution	In kind	196,000	196,000	196,000	588,000
Bilateral Aid Agency(ies)	-	-	-	-	-
Multilateral Agency(ies)	-	-	-	-	-
Private Sector	-	-	-	-	-
NGO	-	-	-	-	-
FONPLATA	Cash	50,000	101,000	249,000	400,000

Source	Type	Year 1	Year 2	Year 3	Total
<b>TOTAL Co-financing</b>		<b>246,000</b>	<b>297,000</b>	<b>445,000</b>	<b>988,000</b>

**Consultants working for technical assistance components:**

Component	Estimated person weeks	GEF (\$)	FONPLATA (\$)	Project total (\$)
Local consultants – <i>US\$400/week</i>	144	-	57,600	57,600
Local consultants – <i>US\$750/week</i>	16	12,000	108	81,000
Local consultants – <i>US\$1,000/week</i>	18	18,000	-	18,000
Local consultants – <i>US\$1,250/week</i>	24	30,000	-	30,000
<b>Total</b>		<b>60,000</b>	<b>177,600</b>	<b>186,600</b>

**Consultants to be hired for the project**

Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
<b>For Technical Assistance</b>			
Local			
Consultant GEF 1.	1,250	24	LPFP Technical Advisor (GEF)
Consultant GEF 2	750	16	Development of mathematical models for spillage routing forecast
Consultant GEF 3	1,000	18	Pilot Demonstration Monitoring and Evaluation
Consultant FONPLATA 1	400	144	Pilot Demonstration Tech. Coordinator (FONPLATA)
Consultant FONPLATA 2	750	16	Short-term river flows forecasting
Consultant FONPLATA 3	750	24	Basin rainfall-runoff modelling
Consultant FONPLATA 4	750	8	Hydrologic network expansion plan
Consultant FONPLATA 5	750	24	Development of a decision support system
Consultant FONPLATA 6	750	24	Development of contingency plans
Consultant FONPLATA 7	750	12	Wetlands conservation plan

**Sub-Contracts with Institutions**

Sub-Contracts	GEF (\$)	FONPLATA (\$)	Tasks to be performed
<b>For Technical Assistance</b>			
Local			
Sub-Contract 1	7,700	-	Inventory of contamination sources

Sub-Contract 2	40,000	-	Systematization of water quality samplings
Sub-Contract 3	-	15,000	Arrangements for 3 Workshops in Argentina
Sub-Contract 4	-	15,000	Arrangements for 3 Workshops in Paraguay
Sub-Contract 8		35,000	Review and update of forecast system
Sub-Contract 9		50,000	Detailed development of local flood zoning and contingency plans
Sub-Contract 10		15,000	Civil Defence Training programs in Argentina
Sub-Contract 11		15,000	Civil Defence Training programs in Paraguay

### 2.11 Timetable:

Activity/Sub-Activity	Year 1						Year 2						Year 3					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1. Coordination and execution arrangement																		
2. Operational System for Forecasting and Hydrological Observation (predict floods and droughts)																		
2.1. Identification of locations and forecasting requirements																		
2.2. Methodologies for the elaboration of water risk maps																		
2.3. Improved network operation system																		
2.4. Social communication and relationship with users																		
3. Operational systems for modeling spills																		
Sub- Activity IIIA																		
Sub- Activity IIIB																		
Sub- Activity IIIC																		
Sub- Activity IIID																		
4. Development of the Decision Support System (Binational Hydro Environmental Alert System)																		
5. Contingency Plans																		
6. Supporting projects and studies																		
7. Monitoring and evaluation																		

**2.13 Risk Analysis:** The development of a Droughts and Floods Alert System requires a great deal of hydrological information which in the present case is scattered in four countries. The diverse, heterogeneous and different jurisdictions involved in the four countries, as regards the actual information exchange on water resources and climate, constitute a risk even though some activities have been designed to improve this situation and minimize the risk. In the federal countries of the Basin, there is a further risk due to the greater number of institutions involved as data is collected and processed by several of them, besides the central authority at the federal government level. Some degree of difficulty is to be expected as countries impose bureaucratic control of this kind of information. Failure of the countries—and their administrative units where applicable—to approve the information exchange would not allow the project to go forward; however, the strong commitment of the Basin countries. Involvement of the appropriate governmental and nongovernmental stakeholders, and the development of inter-ministerial coordinating mechanisms

addressing sectoral concerns within the framework of Integrated Water Resources Management in the la Plata Basin, is designed to minimize this risk.

In spite of the strong interest of the Governments and the CIC, another risk factor is the geographic extent of the Basin, which is a limitation to reach an good understanding of the hydrological regimes, which has been showing some variability that to a large extent is not yet fully explained. Also, an effective and efficient participation and the active involvement of the stakeholders in the Project execution is a challenge considering the basin dimension. The extent of the Basin and the complexity of the Project imply risks, which constitute a challenge for Project implementation. Strong linkages with civil society, professional bodies, and relevant governmental bodies will minimize this risk. Further, the upstream-downstream orientation of the Basin countries could potentially introduce risks from unilateral actions where the national interests of the countries are concerned. Harmonization of legislation, introduction of mechanisms to coordinate actions, and a strengthened CIC provide avenues for minimizing this risk.

From the financial point of view, a possible risk is the lack of effective integration of co-financing. As the GEF partially finances the Project activities, the availability of counterpart resources to co-finance different activities is a risk. Formal agreements between responsible institutions and the CIC prior to the beginning of Project activities will limit these risks.

Finally, it is understood that the level of risk associated with Project execution is very low, considering the great interest of the countries, institutions and organizations involved as well as the existing expected interest at the international level. Nevertheless, the inclusion of institutional strengthening and capacity building elements within this project are designed to reduce this risk by ensuring that the five basin countries have at least a basic ability to implement the strategies identified as an output of this program.

Risk	Risk Mitigation Measures
The diverse, heterogeneous and different jurisdictions involved in the four countries, as regards the actual information exchange on water resources and climate	The development of inter-ministerial coordinating mechanisms addressing sectoral concerns within the framework of Integrated Water Resources Management in the la Plata Basin, and existing Agreements may be emphasized and used in order to expedite information exchange
Geographic extent of the Basin, which is a limitation to effective and efficient participation and the active involvement	Strong linkages with civil society, professional bodies, and relevant governmental bodies will minimize this risk
Lack of interest of the countries, institutions and organizations involved.	Institutional strengthening and capacity building elements within this project
Lack of effective integration of co-financing	Formal agreements between responsible institutions and the CIC prior to the beginning of Project activities

## 2.12 Sustainability:

### ***Institutional***

The project should be developed using local human resources of national and local institutions to guarantee project sustainability. The project will be managed jointly by local teams from Resistencia y Corrientes (composed by members of INA and APA) and Pilar (composed by members of SEAM, the National University of Asunción, University of Pilar, and the National Emergency Committee). The execution teams will be supported by various institutions of the countries: Argentina (INA, SSRH, Provincial Institutions, SIFEM); Bolivia: SENAMHI, universities; Brazil (SMA, ANA, ANEEL, INMET, IBGE, SEDEC) and; Paraguay (UNA, ANNP, DMH-DINAC, CEN, ESSAP, departments and municipalities).

The local teams will be: (i) in the case of Resistencia-Argentina, INA and the Provincial Water Administration (APA) and; (ii) in the case of Pilar-Paraguay, the Secretary of Environment (SEAM), through the Governance of Neembucu, and with additional support from the National University of Asunción, Faculty of Engineering, University of Pilar, and the National Emergency Committee. The Paraguayan local team will be coordinated by the SEAM, General Directorate for Protection and Conservation of Water Resources.

The sustainability of the project would also be provided through the involvement of the Intergovernmental Coordinating Committee of La Plata Countries (CIC), the countries, provinces or directorates, the universities, etc. The integration and exchange of information among national and international governmental and non-governmental entities as well as scientific communities also contributes towards project sustainability.

### ***Environmental***

The project will promote research to increase the knowledge and understanding of the effects of extreme hydrological events (due to climate changes) and/or spills on the population and environment. The project will improve the capacity to forecast, communicate and act upon the occurrence of extreme hydrological events and spills in the region of the confluence of the Paraná and Paraguay rivers. Important water users and economic activities will benefit including urban planning, agriculture and farming, navigation and hydropower generation plants. The continuous improvement in predicting future scenarios on climate and hydrology will benefit, at the local and regional level, land use planners, design engineering, and water resources works.

### ***Financial***

The Framework Program is an initiative of Argentina, Bolivia, Brazil, Paraguay and Uruguay for the integrated management of the water resources of La Plata Basin. The Intergovernmental Committee of La Plata Basin Countries (CIC) will be the local executing agency; the Organization of the American States (OAS) will be the executing agency; and the United Nations Environmental Program (UNEP) will be the implementing agency. The PD-Hydro-environmental Alert System will be financed by Global Environmental Facility (GEF) and counterparts from the countries.

2.13 Replicability: It is important to emphasize the interrelationship of the PD-Hydro Environmental Alert System with the different Activities components of the Framework Program, and the importance of the replicability of the Pilot Demonstration to other vulnerable locations in the La Plata Basin.

At the end of the execution of the PD-Hydro Environmental Alert System, it is expected that the two countries (Argentina and Paraguay) will have a workable Bi-national Hydro Environmental Alert System for risk management (prevention, contingency and rehabilitation) for the metropolitan axis of Resistencia-Corrientes (Argentina) and Pilar (Paraguay), to address the extreme hydrological effects of climate variability and change, to prevent flood and drought-related disasters, and to implement mitigation actions in partnership with Civil Defence authorities. The alert system additionally contemplates modelling and notifications of the extent, seriousness and magnitude of contaminant spills and preparation of contingency plans. It also contributes to the improved knowledge of transboundary critical issues related to hydrological extremes, contingency planning and water quality.

Replicability of the project execution will be assured through its incorporation into the Framework Program. The success experiences of the PD-Hydrologic Alert System will be replicated and applied in other areas of the La Plata Basin (and other basins). Replicability of the project should be assured by including key stakeholders from Argentina, Bolivia (especially from the Bermejo – SAP Bermejo and Pilcomayo), Brazil, Paraguay, and Uruguay.

2.14 Execution arrangement: The execution of the project will be done by local teams from Resistencia and Pilar, with support from institutions in Argentina: INA (the alert systems will be articulated by INA Argentina), SSRH, Provincial Institutions, SIFEM; Paraguay: SEAM and la UNA, ANNP, DMH-DINAC, CEN, ESSAP, governances and municipalities; Brazil (SRH/MMA, ANA, ANEEL, INMET, IBGE, SEDEC); Bolivia: SENAMHI, universities, and specialised institutions and consultants.

The local teams will be: (i) in the case of Resistencia-Argentina, INA and the Provincial Water Administration (APA) and; (ii) in the case of Pilar-Paraguay, the Secretary of Environment (SEAM), through the Governance of Neembucu, and with additional support from the National University of Asunción, Faculty of Engineering,

University of Pilar, and the National Emergency Committee. The Paraguayan team will be coordinated by the SEAM, General Directorate for Protection and Conservation of Water Resources.

The ANNP will provide hydrographic information to develop the models, and ESSAP will provide historical data on water quality as well as follow up on the water quality model. These institutions make part of the National Project Execution Unit, UNP, whose coordination, at the national level of Paraguay, is done by SEAM, General Directorate for Protection and Conservation of Water Resources.

The SEAM, through the governance of Neembuco and the municipality of Pilar, will provide local coordination. The participation of CEN is crucial in the project development, since the product will be used by the technical personnel of CEN and the local municipality, to prepare the local contingency plans. The technical personnel from the Water and Sanitation Service of Paraguay should be also involved, from the project beginning, to help define the structure of the water quality model.

The participation of SENASA and UNP, with laboratories donated by JICA for water quality and pesticides, will provide valuable support to the water quality modeling.

Since the river section is Binational, it is expected cooperation from EBY with a rich baseline data.

The project should be developed with national and local human resources to guarantee sustainability of the project. Consulting activities should be minimized in order to strengthen local capacities. Consulting should be for support/coordination, but with specific scopes and limited timeframes.

Strong participation of universities and specialized institutes in Paraguay and Argentina is encouraged, including graduate study scholarships, and salaries to professors/universities. Several of the modeling requirements and baseline studies can included on Master's thesis work, and implemented locally (Resistencia and Pilar). Exchange programs between universities in Argentina and Paraguay is encouraged.

It would be interesting to evaluate the possibility of including part of the information data base from the biodiversity demonstration project, to generate benefits and synergies among projects.

An essential aspect is to include in the project the gender issue and to promote the participation of woman, as well as ethnical minorities.

Priority should be given to defense structures (including maintenance), and measures to extend consciousness and knowledge of the risks from extreme events.

The system will be a joint initiative from the teams of Argentina in Resistencia, and Paraguay in Pilar. However, it will incorporate existing models and information from associated institutions in Argentina, Paraguay, Brazil and Bolivia, thus, making sure that there isn't duplication of efforts.

It is important to emphasize the interrelationship with the different components of the Framework Program with the Pilot Demonstration and the importance of the replicability of the Pilot Demonstration to the La Plata Basin.

The Director of the PD-Hydro Environmental Alert System project is the Director of the Framework Program (also Secretary of the CIC). There will be 3 national coordinators designated by each country. The International Technical Coordinator of the PD-Hydro Environmental Alert System project will be elected following the methodology established for the Framework Program, and will coordinate the consultants. The International Technical Coordinator of the PD-Hydro Environmental Alert System is responsible for the execution of the PD-Hydro Environmental Alert System, with support from the technical coordinator of the Framework Program. The International Technical Coordinator of the PD-Hydro Environmental Alert System will depend technically of the international technical coordination of the Framework Program. Routine and frequent coordination meetings will be held. OAS as executing agency will perform the financial administration of the Framework Program.

2.17 Public participation mechanisms: The project will encourage public participation by promoting the development of communication and educational tools for the exchange of project-related knowledge and information.

The project will promote strong participation of universities and specialized institutes in Paraguay and Argentina including graduate study scholarships. Several of the modeling requirements and baseline studies can included on Master's thesis work, and implemented locally (Resistencia and Pilar). Exchange programs between universities in Argentina and Paraguay is encouraged.



**2.15 M&E:** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed and comprehensive Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

#### List of Performance and Achievement Indicators and means of verification

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
Binational Hydro Environmental Alert System – Floods and droughts in the confluence area of the Paraguay and Paraná rivers (Argentina and Paraguay) in the axis Resistencia-Corrientes (Argentina) – Pilar (Paraguay)	Design of an Alert System Risk maps Environmental Assessment of extreme hydro-meteorological events Dynamic GIS	N/A	Project progress and final reports Maps & GIS database Minutes and reports from the Committee's meetings Letters and other formal endorsements to the plans
Community Contingency and Hydraulic Works Safety Plans	Contingency plans Experts exchanges and technology transfer		
Transboundary Water Alert Committee			

#### List of Process Indicators, baseline values and means of verification

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
Flood and drought prediction	Degree of certainty in and forecasts	To be established by the Project	To be identified based on existing monitoring and evaluation instruments/systems available in the study area
Extreme events on economic development, and standard of living	Economic losses (in USD) number of deaths, and type of diseases and hospital records measured after extreme events	To be established by the Project	To be identified based on existing monitoring and evaluation instruments/systems available in La Plata Basin countries

#### PROCESS OUTCOMES AND INDICATORS

Process OUTCOMES	Process INDICATORS

<b>Process OUTCOMES</b>	<b>Process INDICATORS</b>
Multi-country agreement on transboundary priority concerns, impact and cause	<ul style="list-style-type: none"> <li>• Constitution of the Technical Group of the CIC relating to the Pilot Demonstration as an advisory committee for the execution of the Project 2 months after its beginning .</li> <li>• Reports and minutes of meetings of the Technical Counterpart of the CIC concerning climate change and water quality</li> <li>• Preparation of a Alert and Contingency Plan by the end of the project</li> </ul>
Effective national Inter-ministry Coordination	<ul style="list-style-type: none"> <li>• Inter-ministerial mechanism established at the national level to agree to the execution of the Pilot Demonstration</li> <li>• Inter-ministerial agreement of the agencies involved in each country to define the representation of the Technical Counterpart of the CIC concerning climate change and water quality</li> <li>• Reports and minutes of meetings of the national groups.</li> </ul>
Stakeholder involvement	<ul style="list-style-type: none"> <li>• Increase awareness of and participation in the Project activities through more than xx workshops and meetings with local authorities, institutions, and stakeholders.</li> <li>• Preparation and wide dissemination of project-related documentation and project-related activities</li> </ul>
Transboundary waters legal framework adopted and/or strengthened	<ul style="list-style-type: none"> <li>• Guidelines for an harmonized legal framework in agreement with the CIC</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions	<ul style="list-style-type: none"> <li>• Cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>• Institutional strengthening (training and equipment) provided to institutions related to the climate variability and its consequences).</li> </ul>

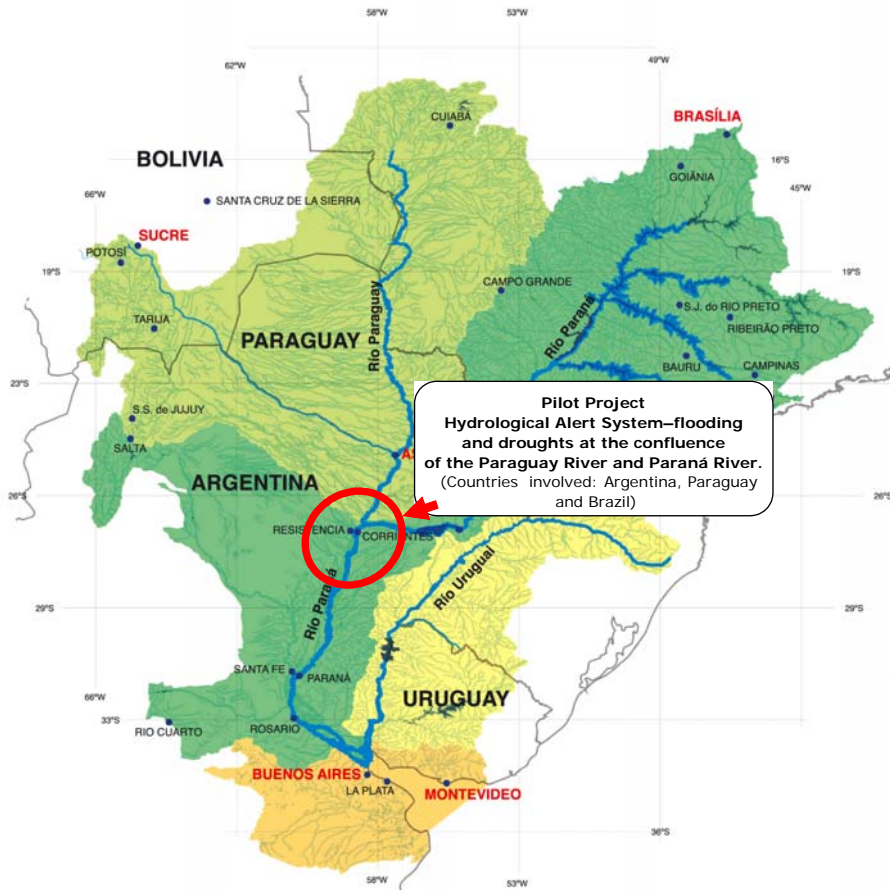
<b>Stress Reduction OUTCOMES in Pilot Demonstration (PD)</b>	<b>Stress Reduction INDICATORS</b>
Reduction of risks associated to floods and droughts to lives and properties due to implementation of the alert system	Reduction of flooding and droughts damages measured in monetary values

<b>Environmental/Water Resources (&amp; Socioeconomic) Status OUTCOMES for Pilot Demonstration (PD)</b>	<b>Environmental/Water Resources (&amp; Socioeconomic) Status INDICATORS</b>
Environmental health and socio-economic wealth	<ul style="list-style-type: none"> <li>- Better water quality control (measured by monitoring system)</li> <li>- Reduction of water induced diseases due to implementation of contingency plans, measured by hospital statistics</li> </ul>

Annex 1: Location map

- Framework Program for the Sustainable Management of the Water Resources of the La Plata Basin -

**Priority Projects and Pilot Projects Location**



Annex 2: Timetable

Activity/Sub-Activity	Year 1						Year 2						Year 3					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
<b>Activity 1</b>																		
<b>Activity 2</b>																		
<b>Sub- Activity 2A</b>																		
Sub- Activity 2A-1																		
Sub- Activity 2A-2																		
Sub- Activity 2B																		
Sub- Activity 2B-1.																		
Sub- Activity 2B-2																		
Sub- Activity 2B-3																		
Sub- Activity 2B-4																		
Sub- Activity 2B-5																		
<b>Sub- Activity 2C</b>																		
Sub- Activity 2C-1																		
Sub- Activity 2C-2																		
<b>Sub- Activity 2D</b>																		
Sub- Activity 2D-1																		
Sub- Activity 2D-2																		
<b>Activity 3</b>																		
<b>Sub- Activity 3A</b>																		
Sub- Activity 3A-1																		
Sub- Activity 3A-2																		
Sub- Activity 3A-3																		
<b>Sub- Activity 3B</b>																		
Sub- Activity 3B.1																		
<b>Sub- Activity 3C</b>																		
Sub- Activity 3C.1																		
Sub- Activity 3C.2																		
Sub- Activity 3C.3																		
<b>Sub- Activity 3D</b>																		
Sub- Activity 3D.1																		
Sub- Activity 3D.2																		
<b>Activity 4</b>																		
Sub- Activity 4.1																		
Sub- Activity 4.2																		
Sub- Activity 4.3																		
Sub- Activity 4.4																		
<b>Activity 5</b>																		
Sub- Activity 5.1a																		
Sub- Activity 5.1b																		
Sub- Activity 5.1c																		
Sub- Activity 5.1d																		
Sub- Activity 5.1e																		
Sub- Activity 5.1f																		
Sub- Activity 5.1g																		
Sub- Activity 5.1h																		
Sub- Activity 5.1i																		
Sub- Activity 5.1j																		
<b>Activity 6</b>																		
Sub- Activity 6.1																		
Sub- Activity 6.2																		
Sub- Activity 6.3																		
<b>Activity 7</b>																		

### Annex 3 – Logframe

It should be noted that the baseline will be established within the first six months of project implementation.

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Main Objective</b></p> <p><i>To improve the ability to predict, communicate, and act during extreme hydro-climatic events and chemical spills in the cities and surrounding areas of Resistencia and Corrientes, Argentina as well as Pilar, Paraguay</i></p>	<p>- Project will improve the ability to predict extreme hydro-climatic events (both flooding and droughts) as well chemical spills along the Paraguay and Parana rivers, and to mitigate socio-economic and environmental damage due to these phenomenon through the implementation of an early warning system</p>	<p>-Hydro-climatic prediction and warning system in the three pilot project cities are able to develop a real time flood forecasting system</p> <p>-Chemical Spill Alert Center is able to quickly model contamination plumes and determine the need to apply contingency plans</p> <p>-Early warning system is accessible to local populations; contingency plans for potential disasters are available.</p>	<p>-A functioning system to predict and warn of hydro-climatic emergencies and chemical spills, with centers up and running in the three cities of the pilot project</p> <p>-Models to predict contamination plumes, are available throughout the project area, facilitating the formulation of common plans and information exchange</p> <p>-Citizens, organizations, and local institutions of Resistencia, Corrientes, Pilar, and other effected zones are alerted about extreme phenomena with sufficient time to mitigate and prevent hydro-climatic and anthropogenic disasters</p>	<p>-In Argentina, Brazil, and Paraguay there currently exists functioning networks of hydro-climatic prediction and warning systems but there is a lack of coordination. Data from disparate stations must be compiled to improve prediction precision in areas of high vulnerability, and actors from all countries will work together to improve the alert system</p> <p>-Country resistance to information exchange will be minimized or eliminated through inter-ministerial coordinating mechanisms</p> <p>-Current systems do not measure secondary flows that exacerbate local flooding from river overflows; accurate measurement of secondary flows is necessary to create robust hydrological models</p>

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Purpose</b>  <i>Prepare and implement a pilot project to predict, communicate, and act during extreme hydro-climatic events and chemical spills at the cities and surrounding areas of Resistencia and Corrientes, Argentina and Pilar, Paraguay, in areas highly prone to flood and drought</i></p>	<ul style="list-style-type: none"> <li>-PDP implemented with support of local institutions and organizations.</li> <li>-Construction of an internationally and locally supported early warning system to anticipate extreme hydro-climatic phenomenon (floods and droughts) and spread of chemical spills.</li> <li>- Develop an alert information system available to local communities and institutions.</li> <li>-Develop contingency plans for emergency situations based on hydrological simulations, with public participation.</li> <li>- Working team locally established, hiring of a PDP technical Coordinator, consultants and subcontracts.</li> <li>-Coordination and promotion of local organizations to promote civil defense and risk management in agreement with local, sub-national and national institutions.</li> <li>-Coordination of the PDP with the LPRB Framework Program, the GEF/UNEP/OAS and the CIC/ FONPLATA co-financing.</li> </ul>	<ul style="list-style-type: none"> <li>- The PDP is established in agreement with local institutions and organizations, covering the areas of Resistencia (Ar), Corrientes (Ar) and Pilar (Py), at the confluence of the Parana and Paraguay rivers.</li> <li>- A hydro-environmental alert system model to predict floods, droughts, and contamination spills at the Paraná-Paraguay river's confluence area is designed.</li> <li>- Contingency plans for emergency situations are available for the cities of Resistencia (Ar), Corrientes (Ar) and Pilar (Py) and surrounding areas.</li> <li>- Tri-national institutional agreements are established to share in time hydro-climatic information.</li> <li>- Locally based bi-national (Ar-Py), decision support system is designed and implemented.</li> </ul>	<ul style="list-style-type: none"> <li>- A technical unit, under the leadership of a PDP's Technical Coordinator is locally established by Y1, Q1.</li> <li>- Agreements signed between the SG/CIC and national, sub-national and local institutions related to hydro-climatic and hydrological data and information, and with national and local organizations of civil defense, to implement the PDP, by Y1, Q2.</li> <li>- Alert system model to predict floods, droughts, and contamination spills available to define possible scenarios and alert system, by Y3, Q2.</li> <li>- Joint contingency plans for emergency situations in place by Y3, Q4, based in the cities of Resistencia, Corrientes and Pilar.</li> <li>- Institutional agreements signed</li> <li>- Daily hydro-climatic reports available.</li> <li>- Bi-national (Ar-Py), decision support system in place between Y2 Q1 and Y3 Q4</li> </ul>	<ul style="list-style-type: none"> <li>-Argentina, Brazil and Paraguay will cooperate with each other to make the alert system more robust.</li> <li>- Institutions owning gauging stations provide data necessary for climate forecasting.</li> <li>-It is possible to improve the gauging and dissemination of hydro-climatic data to ensure early warning of impending natural and anthropogenic disasters.</li> <li>- Institution and stakeholders have strong interest in the PDP proposals.</li> <li>-Local institutions make work space available for coordinator and consultants.</li> <li>- Co-financing from FONPLATA is available and coordinated under the CIC, with the GEF /PNUMA/OAS that are in charge of the general execution.</li> </ul>

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Activity 1</b></p> <p><i>Development of a hydrological observation and forecasting model to predict floods and drought</i></p>	<p>-Construction of a model to predict hydro-climatic disasters. The system will connect to local stakeholders in the PDP area. The monitoring system will coordinate and expand existing monitoring stations within the project area and will include smaller flood-prone rivers that are currently not monitored</p>	<p>- Critical hydrological monitoring sites for installation of stations to enhance prediction and improve data are identified and coordinated with local authorities and communities.</p> <p>- Base topographic map of the PDP area and water/risk maps are prepared and available</p> <p>- Hydrological studies conducted Y1 Q2 through Y2 Q3 with results available identifying the relation between climate variability and climate change with water resources, flow predictions, and regulatory role of wetlands</p> <p>-Improved coordination and dissemination of hydrological data.</p> <p>-Education programs and workshops are conducted, increasing local awareness and knowledge on hydrological issues</p>	<p>- 6 Hydro-climatic monitoring stations installed and equipped in strategic points in order to improve regional and local predictions by end of Y1.</p> <p>-Improved topographical maps and water/risk maps prepared in GIS base for the PDP's area .</p> <p>-Technical thematic reports related to hydrology; on the relation climate variability and change with water resources; flow predictions; regulatory role of wetlands available and accessible to local stakeholders.</p> <p>-Hydrological data transmitted, evaluated and stored in a dynamic GIS system carried out from Y1 Q4 through Y2 Q2</p> <p>- 6 educational workshops (2 in each city), with an average of 30 participants each one, executed. Reports detailing number of participants by institutions and organizations. Printed thematic manuals prepared.</p> <p>- A network training program established, by Y3.</p> <p>-Reports from workshops, seminars, training sessions</p>	<p>-The existing regional system for measuring hydro-climatic data, with its center in the National Institute of Water of Argentina lacks international coordination and will be strengthened as part of the pilot project</p> <p>-Hydro-climatic information in this region is very dispersed due to a lack of measuring stations; the project will increase station density to increase predictive abilities and increase early alert times</p> <p>-There is a need to strengthen local civil defense networks and local institutions, provinces/departments, such that predictions can be made earlier and meteorological variability due to climate change can be better studied</p>

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Activity 2</b></p> <p><i>Development of a system to model and monitor chemical spills</i></p>	<p>-Dispersion modeling of chemical contaminants will be used to prevent and mitigate negative effects of catastrophes in the region. Training activities conducted of local organizations, local populations, and civil defense in the use of the early warning system</p>	<p>- Chemical dispersion model at the Parana and Paraguay river's confluence area designed and calibrated</p> <p>- Mechanisms for institutional information exchange, and chemical spill alert center are established in Resistencia (Ar).during Y1 Q4</p> <p>- A local water quality monitoring system, pilot for LPRB is implemented</p> <p>- potential sources of chemical disasters are identified</p>	<p>between Y1 and Y3 are available</p> <p>-Reports of functioning and accurate chemical dispersion model are available</p> <p>- Institutional protocols for information sharing are signed by Y1 Q4.</p> <p>- A center for chemical spill alert is established in Resistencia (Ar), by Y2, Q2.</p> <p>- Local water quality monitoring system established by Y1 Q4 through Y2.</p> <p>- Report including an inventory of contaminant sources</p> <p>- Technical report on potential sources of chemical disasters, and related data, is completed by Y3 Q2 to Y3 Q3 and made available to local stakeholders</p>	<p>-National, provincial, municipal institutions and civil society organizations are worried about the risks of chemical spills and will take an active role in limiting their effects</p> <p>-Sources of chemical spills will willingly notify alert center of possible contamination.</p>
<p><b>Activity 3</b></p> <p><i>Implementation of a Binational Hydro Environmental Alert System to support decision making.</i></p>	<p>- Construction of a friendly graphical user interface to organize information and models developed in activities 1 (floods and droughts) and 2 (contamination), in order to: (i) to visualize and understand, in a clear and easy way, the results of different models; (ii) to develop, simulate and compare future scenarios in a structured, intuitively</p>	<p>- A local bi-national alert system based in a dynamic GIS map of vulnerabilities and risks incorporating climate and stream flow information is prepared.</p> <p>- Improved local capacity to make decisions to predict and mitigate effects of floods and draughts and/or chemical spills.</p>	<p>- Alert system created and functioning, based in a GIS system with access to local institutions of Ar. and Py. by the end of Y2.</p> <p>- Local institutions and organization with access to real-time hydro-climatic information, with capacity to make decisions to prevent effects of floods and droughts and/or chemical spills, by the end of Y3</p>	<p>-Despite currently operating local information networks operating, public participation needs to be increased and the alert system must be comprehensive and intuitive</p>



	and easy to understand way (including by a non-technical person) and; (iii) to allow access, to parts of the system, to other institutions. The interface will allow for simulating future scenarios	-Enhanced water quality during periods of extreme weather and/or chemical spills relative to past emergency situations	- Alert System in place and used to better predict and warn of hydro-climatic emergencies; increased number of monitoring stations and improved international coordination by Y3.	
<p><b>Activity 4</b></p> <p><i>Preparation of contingency plans to improve emergency response related to floods, droughts, and chemical spills</i></p>	-Development of emergency contingency plans focusing on local community training and participation. Contingency plans for flooding, droughts, and chemical spills in the three project cities. Creation of a bi-national response team to prepare the Contingency Plan	<p>-Contingency Plan for floods and chemical spills based on findings of the PDP is developed by a Bi-national Joint Response Team Y3 Q1</p> <p>- Bi-national response team established and operational.</p> <p>- International training programs on disaster response and catastrophe simulations are conducted Y3 Q4</p> <p>- A Communication Center for early warning is implemented.</p>	<p>- Technically supported Joint Contingency Plan for floods and chemical spills documented and locally managed at the end of Y3.</p> <p>- Bi-national response team created to manage the Joint Contingency Plans by Y3 Q1</p> <p>- Reports from 3 international workshops, including programs and manuals used and list of participants.</p> <p>-Institutional agreements signed and Communication Center for early warning established by Y3 Q3.</p>	<p>-There will exist enough historical climate and flow records from measuring stations to do thorough analysis and monitoring. Any critical areas with insufficient data will be found and monitored</p> <p>-International and local players will cooperate to develop and execute contingency plans</p> <p>-Local organizations will take responsibility for adapting early warning systems to the specific culture of the local area</p>
<p><b>Activity 5</b></p> <p><i>Preparation of hydrological alert system manual and scale-up strategies</i></p>	-Expansion programs in support of the Bi-national Hydro Environmental Alert System	<p>- populations and areas most vulnerable to flooding are identified</p> <p>- Strategies to increase public participation in warning system and disaster response are prepared, alert system manuals are published.</p>	<p>-Technical reports prepared by Y3 Q1 to Q3</p> <p>- Number of new local stakeholders of Resistencia, Corrientes and Pilar involved in warning system and disaster response preparation.</p> <p>- Publications and dissemination of alert</p>	-Local populations will participate in the preparation and execution of the proposed early warning system.

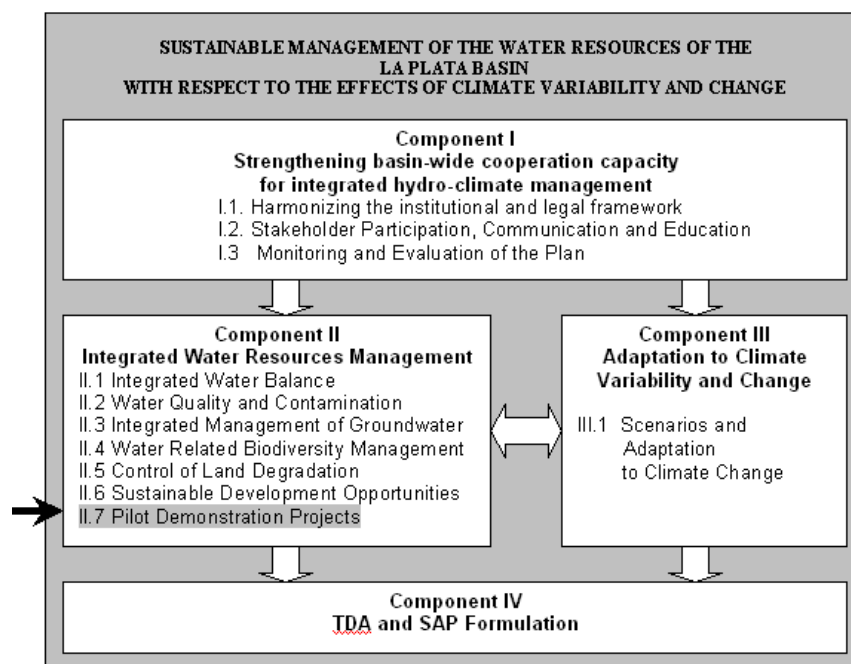
			system manuals by Y3 Q1 to Q3.	
<b>Activity 6</b>  <i>Monitoring and evaluation of pilot project</i>	<p>-Proper institutional monitoring of project, including financial accountability in coordination with OAS/GS. A systematic follow-up of the activities carried out in the pilot project. Evaluation of the replicability of the pilot project within the la Plata River Basin. Annual working M&amp;E programs that incorporate both the monitoring of project progress and the evaluation of replicability. Standard M&amp;E procedures of UNEP (administrative, technical, and financial)</p>	<p>- A M&amp;E framework detailing supervisory roles, financial oversight, and coordination of project is developed</p> <p>- Monitoring and Evaluation plan to ensure efficient execution of project is developed</p> <p>- Replicability of PDP in other areas of the la Plata Basin is assessed and documented</p> <p>-Evaluation performance, project results and lessons learned are documented</p>	<p>-M&amp;E document outlining management structure of the project by Y1 Q1.</p> <p>-Document of the M&amp;E's Working Plan prepared, agreed upon, and in operation by Y1, Q2.</p> <p>-Document evaluating the replicability of the project in other parts of the la Plata Basin completed between Y3 Q3 and Q4</p> <p>- Quarterly, midterm, and final reports</p>	<p>-Lessons learned, recommendations for project sustainability, and replicability of the pilot project will be correctly identified</p> <p>-Adaptive management ensures project management changes as necessary</p> <p>-A final evaluation will be done in which lessons are taken and applied to other parts of the la Plata Basin</p>

**SUBCOMPONENT  
II.7  
Pilot Demonstration Projects**

**Working Element II.7.3  
Pilot Demonstration to Resolve Water Use Conflicts in the Río Cuareim/Quarai Basin**

**Part 1: Project Identifiers –**

- 1.1 Sub-project title: Pilot Demonstration to Resolve Water Use Conflicts in the Río Cuareim/Quarai Basin
- 1.2 Link to umbrella project: Component II: Integrated Water Resources Management  
II.7 Pilot Demonstration Projects



- 1.3 Geographical scope: Uruguay River Basin - Cuareim/Quarai River Sub-basin
- 1.4 Executing Agency/entity: CIC and the Mixed Commission Brazil-Uruguay for the Development of the Cuareim/Quarai River Basin, in cooperation with the following national institutions:
- Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).
- Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).
- 1.5 Duration: 3 years
- 1.6 Focal area(s): IW
- 1.7 GEF grant: US\$ 232,000
- 1.8 Co-financing: US\$ 679,000
- Composed of Counterpart: US\$ 279,000 (Governments contributions in kind)
- FONPLATA grant: US\$ 400,000 (cash)
- 1.9 Total funding: US\$ 911,000
- 1.10 Associated financing: None
- 1.11 Contact person:

Name: Miguel Angel López Arzamendia  
Title: CIC Secretary General and Project Director  
Tel: (54-11) 431 22 506  
Email: [secretaria@icplata.org](mailto:secretaria@icplata.org)

### 1.12 Project summary:

**The subcomponent objective is to** resolve water use conflicts in the Río Cuareim/Quarai Basin, situated on the border between Brazil and Uruguay. It includes the establishment of formal coordination mechanisms at transboundary level within the basin and between the two countries. The outcome is a conflict resolution process in place for sustainable environmental flows in the bi-national Cuarem/Quara river border between Brazil and Uruguay. The activities to be carried out will permit (i) development of an Integrated Management System for the basin which will include five;(ii) promotion of the sustainable use of the water to help solve water conflicts; and, (iii) promotion of the water resources conservation including environmental mitigation, water quality and biodiversity conservation, basin land use planning. Results will include the strengthening of basin committees in each country and at the binational level; a base line and environmental information system to be shared by both countries and a support system for environmental monitoring of water resources; an environmental education program and training on water management practices. Based on the information gathered, guidelines for good irrigation practices will be elaborated, as well as environmental impact mitigation measures. A basin land use plan and a contingency plan will also be prepared. The ultimate goal of this Pilot Demonstration is thus to consolidate the current water management instruments, to design and implement an Integrated Water Resources Management Plan to be shared by Brazil and Uruguay in a basin-wide scale, addressing water use conflict resolution and environmental conservation, within the framework of the above-mentioned Cooperation Agreement.

**Summary Table of subcomponent Work Elements, Output and Outcomes**

Activity	Output	Outcome
II.7.3 Conflict Resolution Process	Pilot Demonstration: Water Use Conflict Resolution in the Rio Cuareimi/Quarai Basin	A conflict resolution process in place for sustainable environmental flows in the bi-national Cuarem/Quara river border between Brazil and Uruguay

**Summary Table of subcomponent Work Elements, Sources of Funding, and Costs**

Activity	Sources of funding						Total Cost (US\$)
	GEF		FONPLATA		Counterpart		
	(US\$)	%	(US\$)	%	(US\$)	%	
1.Coordination & exec. arrangements	30,000	3.3	57,600	6.3	-	-	87,600
2.Integrated management system	60,000	6.6	79,500	8.8	100,400	11.0	239,900
3.Sustainable use of water resources	65,000	7.1	123,000	13.5	77,100	8.4	265,100
4. Conservation of water resources	62,000	8.9	139,900	15.4	75,600	8.3	295,500
5. Monitoring and evaluation	15,000	1.6	-	-	25,900	0,9	40,900
<b>TOTAL</b>	<b>232,000</b>	<b>27.4</b>	<b>400,000</b>	<b>44.0</b>	<b>279,000</b>	<b>28.6</b>	<b>911,000</b>

## Part 2: Project design

### 2.1 Background and context:

**Background and introduction** The transboundary basin of the Cuareim/Quarai River (Figure 1) is an affluent of the Uruguay river in its left margin, and it is shared by Brazil and Uruguay (the river forms the boundary between both countries). The Cuareim/Quarai Basin has an area of 14,685 km<sup>2</sup> out of which 8,258 km<sup>2</sup> (55.6%) is on Uruguayan territory and 6,607 km<sup>2</sup> (44.4%) on Brazilian territory. It includes the municipalities of Santana de Livramento, Quarai, and Uruguaiana, located in the extreme south of the Brazilian State of Rio Grande do Sul, and Department of Artigas located northwest of the Oriental Republic of Uruguay.

Despite the high precipitation and runoff in the area, the Cuareim/Quarai River is characterized by rapid increases and decreases in water levels, low average discharges, and little storage capacity. Drinking water supply (mainly to the cities of Artigas and Quarai) is the priority water use in basin. The second water use (in economic terms the most important use) is irrigation. Since the seventies irrigated rice crops has been expanding with the increasing of water demands. The satellite image of Figure 2 (Annex1) shows the great concentration of rice fields and reservoirs. The third water use is recreation and environmental conservation.

There are serious water conflicts among these three most important water uses (city supplies, irrigated rice production, and environmental flows) within and between both countries. These conflicts tend to further worsen with the occurrence of extreme hydrological events (floods and droughts) and water quality problems. There is a great need to improve coordination and integration of water authorities in both countries – and to develop a joint water resources plan and an irrigation management strategy.

Statement of Issue The GEF PDF-B supported activities carried out between 2003 and 2005 have enabled the Intergovernmental Coordination Committee - CIC, in cooperation with the Plata Basin countries, to agree on a Vision and prepare a Baseline-Transboundary Diagnostic Analysis (Baseline TDA) that identifies the main transboundary problems and their causes.

The Baseline-TDA identified nine current and emerging critical transboundary issues facing the countries and communities of the Plata Basin. Among them, one of the most critical relates to **conflicts and environmental impacts generated by water use for irrigated crops** – with wide impacts on the downstream human uses as well as on ecosystems.

There is need to disseminate in the Plata Basin a vision of integrated and sustainable use of water and environmental resources - so that one specific water user does not restrict other key users in the system. Stakeholder participation and engagement is fundamental to achieve this goal.

The lower Uruguay River (downstream of the Garabí River to its confluence with the Río de la Plata) represents one of the critical and sensitive areas that were identified considering these aspects. In this part of the Basin, particularly in the Cuareim/Quarai River Basin - that forms the boundary between Brazil and Uruguay - there are conflicts mainly between the use of water for urban supplies, irrigated rice production, and recreation and environmental flows.

Conflicts arise from the strong competition for the use of the resource, the impact of irrigation, the impact of extreme hydrological situations (droughts and floods), and changes in the quality of the resource, but primarily due to the lack of a management system that contributes to the functioning of the existing institutional framework for the management of the basin.

The integrated basin management implies managing several complex aspects within the basin territory, considering social, environmental and economical dimensions, and clearly identifying conflicts and opportunities, in order to design plans of action and management instruments. The issue then is to develop instruments that converge to the implementation of an Integrated Water Resources Management System aimed at minimizing conflicts of use by complying with the users needs in a equitable manner, while at the same time coping with the environment conservation needs within a sustainable development vision shared by the stakeholders.

2.2 Pilot Demonstration Objective: The objective of the Pilot Demonstration for the Cuareim/Quarai River Basin (“PP-Cuareim/Quarai”) is to contribute to resolve or reduce conflicts related to water use in the Cuareim/Quarai Basin.

The objectives of the project include:

- a) To generate local experiences to improve integrated water resources management capacities in the basin, seeking to harmonize use at the national and transboundary levels;
- b) To encourage participation of local stakeholders, as well as the existing Binational Commission for the development of the basin, in the conservation and improvement of environmental quality of the basin, through rationale use of water and conflict management and
- c) To help to manage critical transboundary issues by developing knowledge on water resources and irrigation management.

To meet these objectives the main activities include:

- a) Development of an Integrated Management System for the basin which will include five Activities: (i) management tools, (ii) local stakeholders participation, and (iii) environmental education;
- b) Promotion of the sustainable use of the water to help solve water conflicts. It includes improve water management techniques (to optimize multiple uses), development of an environmental monitoring plan, and accounting for extremes hydrological events (floods and droughts) including climate changes and
- c) Promotion of the water resources conservation including environmental mitigation, water quality and biodiversity conservation, basin land use planning.

This project will encourage participation by local stakeholders and the existing Binational Commission for the development of the basin in the conservation and/or improvement of environmental quality through the rationale use of water by solving actual conflicts, including those involving water use for irrigated crops and specifically rice.

2.3 Environmental benefits: One of the most relevant aspects from the environmental point of view in the basin is the final waste water disposal of Quaraí Town in a small river called Sanga da Divisa, a tributary of the Cuareim/Quaraí river, situated near the towns of Artigas and Quaraí. As it is done without any treatment, the degree of contamination is high. The negative impacts are felt when river extreme flows occur: during low flow periods, contaminant effluents are not fully dissolved; during high waters periods, Sanga da Divisa inundates the intakes of the urban potable water treatment plants of both towns increasing contamination risks.

Secondly, local stakeholders have pointed out larger impacts due to droughts as compared to floodings. Droughts cause drinking water shortages, uncertainty and significant social and economical impacts. In Ciudad Artigas, they have caused important losses.

The environmental benefits of this Pilot Demonstration are three-fold: water resources conservation, by promoting good practices and mitigating impacts related to irrigation; biodiversity conservation, by determining and maintaining ecological flows; and last, but not least, increase capacity and resilience to face and solve overexploitation of the water resources while at the same time generate conflict resolution mechanisms.

2.4 Overall sub-project Outcomes: The PD-Cuareim/Quarai will generate local experience to improve integrated water resources management capacities in this basin, seeking to harmonize use at the national and transboundary levels. Additionally, it will encourage participation by local stakeholders and the existing Binational Commission for the development of the basin in the conservation and/or improvement of environmental quality through the rationale use of water by solving actual conflicts, including those involving water uses for irrigated crops, specifically rice. This project will inform about critical transboundary issues by developing knowledge on water use conflicts and the impacts of irrigated land.

2.5. Consistency of the sub-project with national/regional priorities and plans: The waters of the hydrological system of the Cuareim/Quaraí river basin, which covers areas of Brazil and Uruguay, are resources shared by both countries, and thus, they are subject to the judicial organization of different public institutions and the national strategies of in each country.

In the case of Brazil, the current federal strategy is defined by the Water Resources National Policy (NWRP). Ever since the ratification of the Federal Constitution in 1988, the NWRP has been regimented by Federal Law 9.433/97, which integrates the functional mechanisms of the National Policy of the Environment of Federal Law 6.938/81. The Water Resources National Policy has as its main objectives: i) the quantitative and qualitative availability of adequate water for the respective uses of current and future generations; ii) the rational and integrated utilization of water resources, including navigation, to achieve their sustainable development, and iii) the prevention and defense against critical hydrological events of natural origin or as a result of their misuse. In reference to the State of Rio Grande do Sul, which encompasses the Brazilian part of the basin, the State Water Resources Policy was established in Art 171 of the State Constitution, and later complemented with State Law 10.350/94. Even though this last norm is less recent than Federal Law 9433/97, they are very well harmonized.

The institutional and legal organization of Brazil for the management of water, particularly for trans-border basins, is conducted through articulated actions between the National Water Resources Council (assisted by Technical Chamber for the Management of Trans-boundary Water Resources), and federal and state organizations.

In reference to the national strategies of Uruguay, on October 2004 an important step was achieved in relation to the management of water resources with an amendment to the National Constitution. This amendment introduced four aspects related to the definition, exploitation policies, property rights of water resources, and the sanitation and water services. In the first place, water was declared as an essential resource for life and potable water and sanitation services were declared as fundamental human rights. Second, the principles of exploitation policies of water resources were established. These include: i) territorial organization with the objective of protecting the environment; ii) the sustainable management of water resources as a general public interest; iii) the participation of resource users in civil society during all the planification, management, and control phases; iv) a decentralized administration adopting as a common base the hydrological basins; and, lastly, v) that the offer of services should take into account social issues over economic issues. The approved text prescribes that all authorization, concession and exploitation permit that breaches these principles will be eradicated without compensation. Additionally, the reform gives constitutional domain to the public of superficial and subterranean waters. In relation to the public services, the text clearly states that the provision of water for human consumption and sanitation can only be offered by state legislated organizations and personell.

Previous to the reform, the state of Uruguay regulated an ample variety of activities and actions related to the use and conservation of water through the Water Codes of 1979 and through diverse regulatory decrees concerning specific issues. The Executive power, through the Minister of Transport and Public Works (MTO) could legally designate water exploitation rights and the execution of water works. These usage rights are inscribed in a Public Register of Waters, which from the moment of registration, are the only rights recognized by the Administration in situations of conflict, drought, or opposition to new solicitation or water exploitation rights. For its part, the Law of Risks of 1997 introduced new institutional management processes harmonized with the water legislation and environmental legislation incorporated during the 90s (CIC, 2004).

The MTO is in charge of evaluating water and the administration and planned use of the resource. The Ministry of Housing, Territorial Organization, and Environment (MVOTMA) has the responsibility of protecting water resources from the nuisance effects as well as quality control. Both Ministry's have national competency and jurisdiction. Additionally, on certain specific issues they have competency and participation within the following public institutions: MGAP (agricultural irrigation); UTE (Hydroelectric Generation); OSE (water supply and sanitation); DINAMIGE (Hydrological Resources).

Public participation is expressed through public audiences. Water users in the irrigation sector intervene by collaborating with and assisting the MTO and the Ministry of Agricultural Livestock and Fisheries (MGAP) and through the 13 Joint Irrigation Systems that supply the whole country. The legislation does not count on the functioning of water authorities, comitees, or agencies by basin or by region with administrative, technical or financial autonomy until the constitution is reformed. At the moment, Uruguay does not count with a general framework for the management of water or a Water Policy which refers to the Water Codes. Notwithstanding, management plans have been implemented in hydrological basins, such as aquifers, through initiatives of the MTO-DNG, and as the one corresponding to this PPD

2.6 Consistency of the sub-project with the GEF strategies and its strategic programmes: The importance of the La Plata Basin and its global priority have been highlighted in studies such as the GEF/GIWA Project. The convergence of the importance of the water resources of the la Plata Basin as a high value global environmental resource and as an area critical to human economic and social development in this densely settled region provide an ideal case study for GEF OP#9, the Integrated Land and Water Multiple Focal Area Program, allowing the conduct of innovative demonstration projects for reducing contamination, resolving conflicts created by the competing demands of a wide range of stakeholders, and responding to climate-related variations in water flows (GEF IW Strategic Priority IW-3 and GEF CC Strategic Priority for Adaptation--SPA). An essential element of this response will be resolving use conflicts and formulating agreed actions by the Basin governments and their communities, while catalyzing the necessary actions and

funding to resolve shared transboundary concerns (GEF IW Strategic Priority IW-1). Supporting such interventions is the knowledge base available within the sub-region, developed through various national, bilateral and international programs focusing on, amongst others, aspects of integrated water resources management, biodiversity protection and mitigation of soil degradation in critical zones.

Pilot demonstration projects such as the present one are to be performed to provide local management experience and to obtain information for the preparation of a definitive TDA and SAP for the La Plata Basin. This Pilot Demonstration is designed to test the feasibility and determine the actual costs of specific interventions identified through the TDA/SAP process in a basin that already has a transboundary institutional structure. It is focused on the resolution of critical problems, including a strong element of participation by organized civil society.

### 2.7 Coordination and linkages to the umbrella project activities and other related activities in the basin:

There are integrated basin management activities in the Cuareim/Quarai River Basin which can subsidize the project. These include studies conducted by the WMO and GWP under the Pilot Demonstration for the Integrated Development of the Headwaters of the Cuareim/Quarai River Basin, and associated water balance carried out by IMFIA/DNH. These activities complement previous studies such as the management plan of the Quarai River developed by Magna Engenharia Ltda. in 1990 and the 2nd Edition of the water resources utilization plan for the Quarai River Basin, executed in 1996 by MRS Environmental Studies Ltd, refining the 1995 Integrated Management Plan for the Quarai and Rio Grande do Sul Basins, completed by Bourscheid Engineering Ltda.

The pilot project on Integrated Flood Management (IFM) in the basin of the Cuareim/Quarai river is coordinated in Brazil by the Instituto de Pesquisas Hidráulicas (IPH) and in Uruguay by the Dirección Nacional de Hidrografía (DNH). This project has been financially as well as technically supported by the Associated Programme on Flood Management (APFM), which is a joint initiative of the World Meteorological Organization (WMO) and the Global Water Partnership (GWP).

The ultimate target for the basin is the design and implementation of an integrated flood management system in the Cuareim/Quarai river basin (Uruguay/Brazil). Integrated Flood Management should be understood as flood management within the context of Integrated Water Resources Management (IWRM), i.e. the coordinated development and management of water, land and related resources.

During the initial stage of the project, an assessment of the current situation was carried out and the following have been identified to be some of the key IFM components in the Cuareim/Quarai river basin: identification of measures to promote joint flood management within this transboundary basin; definition of flood risks and corresponding urban zoning and the assessment of flood-prone rural areas; the design and implementation of a preliminary flood prediction system; education and dissemination of flood information to local inhabitants; a socio-economic and environmental assessment of the flood-prone area and of the existing emergency plan; enhanced links and coordination between the two countries.

### 2.8 Incremental reasoning:

Baseline: The main conflicts related to the use of water are related to the temporary or extended (drought) scarcity of water resources in the basin. Problems arise when productive activities and water supply to urban centers are maintained at the same levels of non-scarcity periods. Additionally, water is a fundamental resource for the production of rice and when it is scarce during the crucial months of December and January, the land surface that can be cultivated is reduced and there are general losses in lands already cultivated.

Historically, the transboundary areas between Brazil and Uruguay are characterized by cooperation, even so, differences exist between sectors among "dry borders" and "wet borders". In the first case, integration has permitted for urban centers, such as Rivera-Santana or Chuy/Chui, to not have a discontinuity solution. Meanwhile, in sectors with "wet borders", integration has distinct characteristics. In this context, the present Demonstrative Pilot Demonstration opens the possibility for the traditional integration of both countries, and, particularly in a sector with "wet borders", permits the consolidation of existing cooperative actions.

It is important to mention that among the legal existing agreements for the management of "wet boundaries" with trans-border water, both countries signed in December 1933 the "**Convenio para la fijación del estatuto jurídico de la frontera entre el Uruguay y Brasil**" in which Article XIX establishes that, "Each one



*of the States has the right to half the water that runs across the border.*" This clearly demonstrates the preoccupation that both States had with reference to the theme of distribution and use of shared water resources (Arcelus, 1999).

Another important agreement dates to 1963, when the "**Comisión Mixta Brasileiro-Uruguaya para el desarrollo de la Cuenca de la Laguna Mirim (CLM)**" was created. The CLMs field of action covered a region of great economic and social important to both countries which included fertile lands, a majority of which were dedicated to rice production. The accumulated experience in the Mirim Lagoon region has been useful for both countries to advance in the establishment of an institutional framework for the management of the river; the main objective of this PPD.

For the specific case of the Cuareim/Quaraí basin, it is important to highlight that on March 11<sup>th</sup>, 1991, the "**Acuerdo de Cooperación para el Aprovechamiento de los Recursos Naturales y el Desarrollo de la Cuenca del Río Cuareim/Quaraí**" was signed. Its objective is to advance the integrated development, coordinated management, and sustainable development of the basin.

Among the proposed objectives of the Agreement, it is important to highlight both nations interest in:

- The rational and equal utilization of water resources with domestic, urban, agricultural and industrial uses;
- The regulation of flow and control of floods;
- The establishment of an irrigation and drainage system for agricultural uses;
- Solution to the problems derived from overexploitation;
- The recuperation and conservation of the environment;
- The management, adequate utilization, recuperation, and conservation of the hydrological resources and land of the region while taking into consideration the characteristics of the basin; and
- The elevation of economic and social levels of the regions inhabitants.

Within the Agreement framework, both countries agreed to, among other things, the development of a "**Comisión Mixta Brasileño-Uruguaya para el Desarrollo de la Cuenca del Río Cuareim**" which would be responsible of the execution of the Agreement signed by both countries. Among the main objectives of the Commission, it is important to point out the coordination of competent organizations and the equal management, utilization, recuperation and conservation of the hydrological resources of the Basin as well as the other natural resources.

More recently, on May 6<sup>th</sup>, 1997, the "**Ajuste Complementario**" of the 1991 Agreement was signed with the main purpose of advancing towards the coordinated management of the basin. Additionally, at this point, the prioritized public use of the waters of the Cuareim/Quaraí river for both countries was defined; a maximum mixed flow for irrigation purposes and the competent institutions to define the usage rights of the resource were established. Once a year, these institutions have to report the established water rights to their counterpart in the other country. It is important to point out that the aforementioned institutions are precisely the Dirección Nacional de Hidrografía (DNH) (Uruguay) and the Secretaría de Recursos Hídricos y Ambiente Urbano (SRHU) (Brasil).

Due to the fact that Brazil is a Federal State, it relies on diverse normative frameworks with relation to water resources and the environment. These frameworks are composed of regional, Estado de Rio Grande do Sul, and national norms, those representative of the federal union. On the other hand, Uruguay is a unitary nation, counting only on a framework of national norms. This poses a challenge on the actually establishing an integrated management of the basins waters and environment.

Increment: In spite of the fact that there is already an institutional framework in each country and at the binational level, the Pilot project will be of great value to make stakeholders to seat together and discuss practical solutions for their conflicts of interest. In this sense, the pragmatism with which the Pilot Demonstration was conceived will be an essential instrument to create negotiation fora and opportunities, bases on reliable management tools, information and stakeholders participation.

Besides, through environmental education, values such the need for water and biodiversity conservation practices will be enhanced, together with law enforcement possibilities to be used by authorities in both countries, to refrain abuse in the water utilization.

Alternative: Although there is a long history of agreements between both countries they seem to have been insufficient to avoid problems such as those that have been reported and that are being used to justify this Pilot Demonstration. Therefore, if left as they have been acting so far (the business-as-usual way of facing the transboundary problems), countries national and local authorities, as well as the stakeholders, would perhaps continue facing an increasing degree of difficulty to resolve conflicts.

The alternative in the end would perhaps be the resource to international courts, with clear and high stakes to anyone involved, so that it could only be considered as a last resort.

Of even higher importance would be the difficulty to tackle the biodiversity conservation issues since at the peak of a conflict for water for human needs these issues would be certainly be left as a second priority, possibly leading to irremediably damages to the environment.

Incremental reasoning: The GEF participation in this Pilot Demonstration is a consequence of the commitment of the five countries of the La Plata Basin to work together, and in a coordinated fashion. Taking a regional approach to the integrated management at basin level has been shown to be much more effective approach compare with undertaking these actions on an individual or national basin. In particular, Brazil and Uruguay which have long been partners in other important initiatives, will certainly take advantage of the catalytic effect of this Pilot Demonstration.

At the local level, the stakeholders interest should be stressed. The reason for it is simply the fact that the region is an important rice producer. Brazil consumes all rice that is produced in the basin and in fact imports a substantial amount. It should be stressed that Uruguay is the main source of what Brazil imports (more than 40% in 2003). On the other hand, in Uruguay, rice has reached the limits of the main production region in the country (the Laguna Merín region), but there still remains some expansion possibilities precisely in the Cuareim basin, where the last rice culture expansion period occurred.

#### 2.9 Activities – outputs – outcome:

Project objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
<b>Project objective and Outcomes Objective</b>  To resolve water use conflicts in the Río Cuareim/Quarai Basin, situated on the border between Brazil and Uruguay	1 - Institutional frameworks at basin level within each country and in the binational context are functional	Existing institutions created by Binational Cooperation Agreement lack power and recognition	Countries decided to implement a Pilot Demonstration to develop experience on local conflict resolution	A conflict resolution environment is consolidated at basin level through institutions and procedures
	2 - Conflicts are solved within the basin management context	Conflicts still occur	Negotiation tables were formally proposed and are being formed	Negotiations tables are operating and effective
	3 - Environment conservation policy is recognized by stakeholders	Not recognized	An environmental mitigation and control plan of measures and an education program were developed	Environmental mitigation and control measures and environmental education are being implemented
	4 - Public participation mechanisms are operational in both countries	Very low degree of participation	Motivation and mechanisms for consensus building within the basin were devised and are being discussed with stakeholders	Participation mechanisms and fora implemented and active with a significant degree of public participation

Project objective and Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
1. Institutional strengthening for a coordinated basin management	There are formal coordination institutions within each country and at the binational level to deal with the issues of the Pilot Demonstration	They are weak	Basin Committees were created in each country and at the binational level	Committees implemented and functioning
2. Agreed instruments, operational procedures, and experimental measures to reduce irrigation related conflicts	There are mechanisms, operational and experimental measures to reduce irrigation related conflicts	Not enforced	Robust operational procedures were designed and are under analysis and discussion by stakeholders.	Management Tools , Conflict resolution and Operational procedures were consensed and implemented in both countries
3. Environmental Information System	Information systems and management tools exist and are useful for conflict resolution	Present systems are not coordinated nor are operational in a basin basis	An integrated baseline and hydrologic and land use monitoring were developed and are operational	A water and land use basin model is being used as a management tool
4. Establishment of mechanisms to mitigate impacts on health and environmental quality	Environmental mitigation and control measures are being used and are effective	Law enforcement lack behind of what is needed	Mechanisms to improve water quality and reduce soil erosion are being implemented on a basin wise basis (50% completed)	Ecohydrologic measures implemented in critical areas and show good results in improving water quality and soil erosion. Environmental flows are being enforced.
5. Establishment of mechanisms to mitigate natural and anthropogenic risks	Natural and anthropogenic risks are known and are under control to the extent possible	Very little knowledge is available. Damages have been very high	Vulnerability to extreme events (floods and droughts) have been determined Contingency plans were developed and are being handed over to municipalities	Municipalities are improving readiness and resilience to face extreme events on the basis of a contingency plan. Land use control is being enforced on the basis of legal instruments. An Alert system is functional.
6. Preparation and implementation of a formal educational and training program on water management in the basin and stakeholder participation at all levels	Stakeholders and citizens are aware of the problems caused by the land and water overexploitation resources and agree to implement management and control tools	There are some initiatives towards improving the degree of consciousness about the existing problems in the Basin	Education and training programs have been developed and implemented. At least 50% of the Basin population have attended at least one of the courses and workshops	Increased motivation and participation shows a higher level of social drive towards better living standards, base on public opinion surveys.

### II.7.3 Pilot Demonstration: Water Use Conflict Resolution in the Rio Cuareimi/Quarai Basin

**Objective:** To resolve water use conflicts in the Río Cuareim/Quarai Basin, situated on the border between Brazil and Uruguay

**Outcome:** A conflict resolution process in place for sustainable environmental flows in the bi-national Cuarem/Quara river border between Brazil and Uruguay

**Output II.7.3 Pilot Demonstration: Water Use Conflict Resolution in the Rio Cuareimi/Quarai Basin****Activities**

- a) Establish pilot-demo coordination unit
- b) Formulate an integrated management system
- c) Assess sustainable use of water resources in pilot area
- d) Put in place mechanisms for water resources conservation
- e) Monitor and evaluate activity and prepare scale-up strategy

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
a) Establish pilot-demo coordination unit	Staff and consultants for implementation of project activities.	No coordination unit in place	A technical unit is locally established by Y1, Q1	Technical Unit adequately monitoring implementation of project activities
b) Formulate an integrated management system	<ul style="list-style-type: none"> <li>-Management tools for water monitoring and institutional planning.</li> <li>- A bi-national environmental database including information on uses and quality of water.</li> <li>- Bi-national and national workshops and Negotiation Round Tables on competitive uses of water.</li> <li>-Environmental education and training programs for local teachers, rice and cattle farmers and local communities; training programs for municipal and water management employees.</li> </ul>		<ul style="list-style-type: none"> <li>- 1 Document outlining joint operational guidelines for water rights; water capture and storage infrastructure systems; designs and feasibility studies for storage dams; and proposed irrigation board to manage irrigation policies, from Y1 through end of Y2</li> <li>-Database available to institutions and stakeholders, accessible to both countries by Y2, Q1</li> <li>- Training programs, educational manuals and training material, reports from workshops, Aid-memoires from meetings and Round Tables</li> </ul> <p>Educational material published and locally distributed in sectors related to water uses from Y1 Q4 through end of Y3.</p>	<ul style="list-style-type: none"> <li>- Joint operational guidelines for a water rights system and standard operational rules and procedures</li> <li>- Implementation of educational program on basin water management</li> <li>- Completed training programs for teachers (primary and secondary schools), farmers (rice and cattle ranching), municipal employees and basin water management agents</li> <li>- Development of measures to improve irrigation efficiency and hydraulic works for water capturing and storage in urban areas;</li> <li>- Feasibility Study for the creation of a binational irrigation board for the integrated irrigation management in the basin.</li> <li>- Data base of uses and users information system, shared by both countries</li> </ul>

<p>c) Assess sustainable use of water resources in pilot area</p>	<p>Studies to analyze and determine water and land uses in the project area</p> <p>Conservation plans and proposals for critical areas</p> <p>Water use efficiency plan and a productivity improvement plan.</p> <p>-Development of environmental monitoring and implementation of associated monitoring of hydrological parameters and land uses.</p> <p>- Analysis of extreme events aimed at determining vulnerabilities and elaborating contingency plans.</p>	<p>Current water resource conservation efforts are not well organized nor comprehensive</p>	<p>-Technical reports of surveys and results, including environmental baseline completed by Y3 Q1</p> <p>-Monitoring system in place and running by end of Y3, data available in bi-national environmental database.</p> <p>- 2 documents of the plans prepared; institutional and legal arrangements to implement the plans, by Y2.</p> <p>-Assessment of extreme events and development of contingency plans are completed by Y3, Q3.</p>	<p>-Measures to control over-exploitation of water and land resources have been designed and implemented</p> <p>-Proposals for biodiversity conservation and land use plan and management have been designed and agreed upon</p> <p>-Environmental flows are technically defined and locally agreed</p> <p>Technical reports of surveys and results, including environmental baseline</p> <p>-Monitoring system in place and running, data available in bi-national environmental database.</p> <p>Vulnerability analysis and a contingency plan completed and available on-line</p>
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<p>d) Design and implementation of mechanisms for water resources conservation</p>	<p>-Development and implementation of measures to control and/or reduce over-exploitation of land and water resources through improved planning, and implementation of biodiversity conservation measures</p>		<p>-Document prepared and widely distributed outlining measures to control over exploitation of water and land resources, including results from water balances analysis, proposed erosion control measures, flow recovery in urban areas, eco-hydrological programs, and irrigation guidelines, by Y3.          - One (1) Report including the results of trophic evaluations and environmental flow measurements, by Y3, Q3.          -Updated register of rural and urban water uses available with the technical counterpart agencies.          -Extreme event alert system, contingency plans, and guidelines for irrigation practices available by Y3, Q3          -Technical reports on environmental flows for the Cuareim-Quarai River agreed by the Bi-national Commission for the Development of the Basin, by Y3,Q2.</p> <p>Number of water conflicts identified at the beginning and at the end of the PDP.</p>	<p>-Measures to control over-exploitation of water and land resources are developed and available to relevant stakeholders</p> <p>-Biodiversity conservation program is designed and adopted by relevant institutions.</p> <p>-Land use plan and management proposals are developed and endorsed by local authorities, civil society, and communities</p>
<p>II.7.3 Pilot Cuareim - 08 April 2009</p>			<p>-Technical reports of water quality/flows, biodiversity reports          -Measured</p>	

e) Monitor and evaluate activity and prepare scale-up strategy	Establishment of mechanisms and procedures for institutional monitoring of project activities, including financial accountability, with a systematic follow-up of the components and activities carried out in the PDP, and evaluation of the replicability of the pilot project within the LPRB.	No Monitoring and evaluation mechanisms designed and-or implemented	<ul style="list-style-type: none"> <li>-Document with M&amp;E Plan outlining management structure developed, agreed upon and available by Y1, Q1.</li> <li>- Agreement between CIC and national/local institutions for project execution signed by Y1, Q1.</li> <li>-Document evaluating the replicability of pilot project within the context of LPRB completed between Y3, Q4, with the identification of potential areas for replication.</li> <li>- Monthly, quarterly, half yearly and yearly reports prepared and available on line throughout project execution.</li> <li>- Mid term and final evaluation documents prepared and available on line.</li> </ul>	<ul style="list-style-type: none"> <li>- M&amp;E framework detailing supervisory roles, financial oversight, and project coordination.</li> <li>- Institutional arrangements for a coordinated PDP under the LPRB Framework Program</li> <li>- M&amp;E plan to ensure efficient execution of the PDP developed and agreed upon</li> <li>-Evaluation of performance, achievements, and lessons learned.</li> <li>- PDP reports outlining project progress based on indicators.</li> <li>- Assessment of PDP replicability in the La Plata Basin, summary of achievements and lessons learned.</li> </ul>
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**2.10 Budget:**

GEF grant: US\$ 232,000

Co-financing: US\$ 679,000

Composed of Counterpart: US\$ 279,000 (*Governments contributions in kind*)

FONPLATA grant: US\$ 400,000 (*cash*)

Total funding: US\$ 911,000

**Financial Table of the GEF Budget (US\$)**

<i>Concept</i>		<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Total</i>
1200	Consultants	12,000	12,000	12,000	36,000

<i>Concept</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Total</i>
2200 Subcontracts with institutions	27,000	47,000	30,000	104,000
3200 Workshops and Training	12,000	15,000	12,000	39,000
4100 Supplies and Equipment	10,000	8,000	5,000	23,000
5200 Publications and documents	10,000	10,000	10,000	30,000
<b>TOTAL</b>	<b>71,000</b>	<b>92,000</b>	<b>69,000</b>	<b>232,000</b>

### **Co-financing (US\$)**

<b>Source</b>	<b>Type</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Total</b>
Governments Contribution	In kind	27,500	140,900	110,600	279,000
FONPLATA grant	Cash	49,000	175,000	176,000	400,000
<b>TOTAL Co-financing</b>		<b>76,500</b>	<b>297,900</b>	<b>286,600</b>	<b>679,000</b>

### **Consultants working for technical assistance components:**

<b>Component</b>	<b>Estimated person weeks</b>	<b>GEF (\$)</b>	<b>FONPLATA (\$)</b>	<b>Project total (\$)</b>
Local consultants	144	-	57,600	57,600
Local consultants	120	66,000	24,000	90,000
Local consultants –	15	15,000	-	15,000
Local consultants –	24	30,000	-	30,000
<b>Total</b>		<b>75,000</b>	<b>81,600</b>	<b>156,000</b>

### **Consultants to be hired for the project**

<b>Position Titles</b>	<b>\$/ person week</b>	<b>Estimated person weeks</b>	<b>Tasks to be performed</b>
<b>For Technical Assistance</b>			
Local			
Consultant GEF 1	1,250	24	LPFP Technical Coordination
Consultant GEF 2	1,000	15	Project Monitoring and Evaluation
Consultant GEF 3	750	8	Development of water management tools
Consultant GEF 4	750	8	Demand analysis and scenarios
Consultant GEF 5	750	8	Efficient irrigation planning
Consultant GEF 6	750	8	Biodiversity protection plan
Consultant GEF 7	750	8	Brazilian legal & institutl framework f/ basin mangment
Consultant GEF 8	750	8	Uruguayan legal & institutl framework f/ basin mangment
Consultant FONPLATA 1	400	144	Pilot Demonstration Tech. Coordinator (FONPLATA)
Consultant FONPLATA 2	750	8	Hydraulic works design criteria
Consultant FONPLATA 3	750	8	Legal & institutl framework f/basin magement
Consultant FONPLATA 4	750	8	Vulnerability analysis & contingency plannng



Consultant FONPLATA 5	750	8	Elaboration of common basin management directives

### **Sub-Contracts with Institutions**

<b>Sub-Contracts</b>	<b>GEF (\$)</b>	<b>FONPLATA (\$)</b>	<b>Tasks to be performed</b>
<b>For Technical Assistance</b>			
Local			
Sub-Contract 1	12,000	-	Elaboration of a SIG including data acquisition and preparation of maps
Sub-Contract 2	20,000	-	Field water use survey and preparation for campaign of water rights registration
Sub-Contract 3	20,000	-	Call center for water rights registration
Sub-Contract 4	15,000	-	Arrangements for 3 Workshops in Brazil
Sub-Contract 5	15,000	-	Arrangements for 3 Workshops in Uruguay
Sub-Contract 6	11,000	-	Promotion of social participation in Brazil
Sub-Contract 7	11,000	-	Promotion of social participation in Uruguay
Sub-Contract 8		11,000	Promotion of social participation in Brazil (2 <sup>nd</sup> )
Sub-Contract 9		11,000	Promotion of social participation in Uruguay(")
Sub Contract 10		15,000	Arrangements for 3 Workshops in Brazil
Sub-Contract 11		15,000	Arrangements for 3 Workshops in Uruguay
Sub-Contract 12		30,000	Micro-hydraulic works planning & design
Sub-Contract 13		30,000	Construcution Design of the Sanga da Divisa Wastewater Treatment Plant
Sub-Contract 14		15,000	Training program for public agents, teachers, and communities leaders in Brazil
Sub-Contract 15		15,000	Training program for public agents, teachers, and communities leaders in Uruguay
Sub-Contract 16		20,000	Implementation of demonstrative soil conservation efficient irrigation practices in Brazil and Uruguay
Sub-Contract 17		40,000	Development and implementation of Hydrological Basin Models for floods and droughts forecast and water allocation

### **2.11. Timetable:**

This Pilot Demonstration will be developed in three years as follows:

<b>Activities / Sub-Activities</b>	<b>Year 1</b>				<b>Year 2</b>				<b>Year 3</b>			
	1	2	3	4	1	2	3	4	1	2	3	4
<b>Activity 1: Project coordination and execution arrangements</b>												
<b>Activity 2: Integrated Management System (SGI)</b>												
2.1 Management Instruments												
2.2 Information Systems												
2.3 Social Participation												
2.4 Environmental Education												

Activities / Sub-Activities	Year 1				Year 2				Year 3			
	1	2	3	4	1	2	3	4	1	2	3	4
<b>Activity 3: Sustainable Use of Water Resources</b>												
3.1 Multiple uses of water												
3.2 Environmental monitoring												
3.3 Extreme situations												
<b>Activity 4: Conservation of water resources</b>												
4.1 Mitigation of impacts												
4.2 Environmental conservation												
4.3 Land use planning												
<b>Activity 5: Monitoring and evaluation</b>												
5.1 Monitoring of progress												
5.2 Evaluation of performance and results												

**2.12 Cost effectiveness:** Cost effectiveness is a concept that envisages optimizing both human and financial resources through (1) considering the transboundary dimensions of the issue to be addressed and (2) taking transboundary issues in such a manner as to yield global benefits, in this case to the whole Plata basin, considering the pilot character of this project. At the technical and economical level, it can be maximized by developing focused pilot interventions, in this case in a shared sub-basin that extends itself in the territories of the two countries, with a view that such interventions can be replicated at the whole basin level in conformity with regional guidelines and agreements.

In this respect, it should be said that this Pilot Demonstration will allow the analysis of conflicts and problems arising from the lack of common knowledge about water and land management in the area, considering the existing experience and legal frameworks of both countries. On the basis of this analysis, integrated conflict resolution measures will be developed and implemented.

The fact that the analysis will be done jointly by the countries will allow facing the issue of asymmetries and level out technical skills in the region, with lesser costs but at the same time with higher additional benefits for future developments. Additionally, technical and economic benefits will be maximized due to the synergy achieved through joint action at the local and basin level, especially with the GEF projects in the region. The agreed strategy for the basin management will consider water and environmental aspects, particularly aquatic and terrestrial ecosystems, integrating transboundary issues, for the benefit of the whole basin.

In this specific case, by implementing conflict resolution procedures and contingency plans for droughts and floods alert systems will be optimized and the social, economical and environmental resilience will be increased, under the regional scenarios. Besides, it will facilitate an increased consensus among regional scientific groups, ngos, stakeholders (farmers) and citizens in general, thus generating a increased capacity to face and mitigate the direct impacts of water use conflicts and also their indirect impacts on the environment and biodiversity.

**2.13 Risk Analysis:** It is expected that various actors will participate during the execution of the PPD. These will include, the habitants of the basin, government institutions, private institutions, civil society, and diverse international organizations (CIC, OEA, FONPLATA, UNESCO, and others).

The main risk hypothesis encompasses the local, physical, and human aspects were the project intervenes:

- The actions undertaken by the Governments of Brazil, Uruguay, and International Organizations are prioritized by the intervention at the basin level, the embitterment of the living conditions of the basin inhabitants, and the diffusion of economically sustainable practices.
- The public institutions of both countries with jurisdiction in the basin are willing and available to articulate their actions and interventions with the PPS and to actively participate in the activities of the Bi-National Comitte and the Local Management Comitte.
- Both countries will coordinate to verify that:

- The norms established in the 1991 Agreement, its complementary adjustment of 1997, and other valid management norms of the basin are followed.
- The funds allotted for the execution of the PPD, including the funds designated to regional personell, are sufficient to cover all necessities and that they arrive on time when needed.
- The completion of studies will be transformed into useful actions that will mark the outset of an intergrated management of the Cuareim/Quaraí. Basin at a significant scale in reasonable time
- The farmers and water users of both countries show a preventive attitude towards mitigating existing conflicts, and, additionally, that the beneficiaries of the basin collaborate with the design and implementation of the programs and actions of the PPD.
- The municipal authorities adopt the results of the project as normative products.
- The population agrees with the zonification rules of the critical areas.

### Risks and Flexibility

The execution of the project greatly depends on the capacity of the executing organizations. At the same time, external organizations and financial agents involved in the project are limited in their capacity to coordinate the Project Framework, the CIC, the Comisión Binacional Comisión Mixta Uruguayo-Brasileña for the development of the Cuareim/Quaraí basin, and the level of organization and participation of the beneficiary communities.

Risk	Rating (L/M/H)	Risk Mitigation Measures
1. Lack of or low motivation for the implementation of the Pilot Demonstration	L	Promote information on the expected outputs and outcomes of the Project and motivate participation
2. Funds do not arrive on time or are not sufficient	M	Monitor and act so that the funds are made available when and in the amount needed to implement the project
3. Low technical quality of studies reports and results	L	Monitor and evaluate reports and results, take corrective measures well in advance.
4. Persisting conflicts among stakeholders on each side of the border due to inadequate water uses	L	Promote campaigns in favor of laws and proper enforcement.

**2.14 Sustainability:** From the onset, a sustainability vision will be the driving force of project, which would be characterized by the participation of local actors in the implementation of the actions which have been proposed so that they become the local stakeholders and owners of the established processes. The authorities of both countries should ensure that a major part of the activities include the participation of *local actors* (Juntas de Riego, Asociaciones de Productores, Empresarios locales, Municipalidades, ONGs, otros). The sustainability vision's focus will interactive and directed towards *accompanying and supporting existing ideas and initiatives of environmental protection and development*, assuring an growing control of the development process thanks to a progressive learning curve.

### **Institutional**

The project will promote establishment of formal coordination mechanisms between the Quaraí River Basin Committee (Grande do Sul River) and the Federal State; creation of the Cuareim River Basin Agency at a national level (Uruguay); creation of a Basin Council to support the Brazilian-Uruguayan Mixed Commission for the Development of the Cuareim/Quaraí River Basin; creation of a binational irrigation board for the integrated irrigation management in the basin; development of micro-hydraulic measures of water capture and storage in urban areas; and flood and drought contingency program articulated with the Salto Grande

Binational Entity; preparation of a formal educational and training program on water management in the basin.

The project aims the integrated management of the Cuareim/Quaraí River Basin and therefore will promote the organization of the Local Management Committee under the technical, institutional and economical guidelines of the Brazilian-Uruguay Mixed Commission for the Development of the Cuareim/Quaraí River Basin. The participating institutions include National Project Units, irrigation associations, producers association, local entrepreneurs, municipalities, NGO, and others.

The project should be developed using local human resources of national and local institutions to guarantee project sustainability. It is assumed that: (i) the governments of Grande do Sul River and the Federal State in Brazil are willing to establish the Quaraí River Basin Committee, and allocate funds in their budget for its operation and; (ii) civil society across the international border understand the need to coordinate efforts.

The sustainability of the project will be granted by the existing basin committee and engagement of the governments of both countries during the implementation (as it happened in the preparation phase), as well as through the involvement of the Intergovernmental Coordinating Committee of the Plata Countries (CIC), the countries by directorates, the universities, etc. The integration and exchange of information among national and international governmental and non-governmental entities as well as scientific communities also contributes towards project sustainability.

### ***Environmental***

The pilot project will generate local experiences to improve integrated water resources management capacities in Cuareim/Quaraí Basin. It will encourage participation by local stakeholders and the existing Brazilian-Uruguay Mixed Commission for the Development of the Cuareim/Quaraí River Basin in the conservation and/or improvement of environmental quality through the rationale use of water by solving actual conflicts, including those involving water uses for irrigated crops, specifically rice.

Environmental and economic benefits include: (i) avoid water shortages in the river Cuareim/Quaraí at the intakes of State Sanitation Works (Obras Sanitarias del Estado) - OSE and Sanitation Company of Rio Grande do Sul (Compañía Riograndense de Saneamiento) -CORSAN; (ii) avoid contamination in the river Cuareim/Quaraí at the intakes of OSE and CORSAN; (iii) avoid losses of crops and economic losses on livestock due to water shortages; (iv) improve water quality of the river in urban areas; and (v) avoid losses or even increase rice cultivation areas.

### ***Financial***

The Framework Program is an initiative of Argentina, Bolivia, Brazil, Paraguay and Uruguay for the integrated management of the water resources of La Plata Basin. The Intergovernmental Committee of La Plata Basin Countries (CIC) will be the local executing agency; the Organization of the American States (OAS) will be the executing agency; and the United Nations Environmental Program (UNEP) will be the implementing agency. The PP-Cuarei/Quaraí will be financed by Global Environmental Facility (GEF), FONPLATA, and by the countries as counterparts.

#### 2.15 Replicability: discussing up scaling strategy especially for demo projects and SPA measures

It is important to emphasize the interrelationship of the PP- Cuareim/Quarai with the different components of the Framework Program, and the importance of the replicability of the Pilot Demonstration to other sensitive locations in the Plata Basin. Replicability of the project execution will be assured through its incorporation into the Framework Program.

It is also essential to replicate to other shared basins the pilot implementation of the Committee Board and the articulation of the Binational Committee with the national and state committees. The Framework Program and the CIC can provide the necessary structure for achieving these objectives.

The Project has a strong social component and will develop strategies that are transferable to the La Plata Basin and that help to manage water resources related conflicts. It is expected a change of paradigm in terms conservation and rationale use of water and conflicts resolution, including those involving water use for irrigated crops, specifically rice.

**2.16 Execution arrangement:** The project will be executed -as part of the Framework Program- by the Intergovernmental Coordinating Committee for the Plata Basin Countries (CIC), Mixed Commission Brazil-Uruguay for the Development of the Cuareim/Quarai River Basin, and the national and local governmental organizations of Brazil and Uruguay. The coordination and supervision will be carried out by Technical Coordinator. Technical Consultants will be contracted for specific tasks including technical report preparation, conduct of meetings, press releases and support to public participation.

A Project coordinator and two supporting technical staff will be assigned. The coordinator of the Project will lead the execution in direct relationship with a Local Executing Council. The Council will be composed by two representatives of each country (total of four). Each representation will be under the direction of the National Coordinator of the Framework Program. This group periodically will verify and perform required changes on planned tasks. A National Team for each country will be created composed of representatives of the different stakeholders involved (irrigators, entrepreneurs, NGO's, and others) with duties defined by each country. The two representatives of each country will make part of the National Team and will transmit the national views and position to the Local Executing Council.

The Director of the PP- Cuareim/Quarai project is the Director of the Framework Program (also Secretary of the CIC). There will be 2 national coordinators designated by each country. The Technical Coordinator of the PP- Cuareim/Quarai project will be elected following the methodology established for the Framework Program, and will coordinate all the tasks. The Technical Coordinator of the PP-Cuareim/Quarai will be responsible for the execution of the PP-Cuareim/Quarai.

The project should be developed with national and local human resources to guarantee sustainability of the project. Consulting activities should be minimized in order to strengthen local capacities. Consulting should be for support/coordination, but with specific scopes and limited timeframes.

Strong participation of universities and specialized institutes in Brazil and Uruguay is encouraged, including graduate study scholarships.

An essential aspect is to include in the project the gender issue and to promote the participation of woman, as well as ethnical minorities.

**2.17 Public participation mechanisms:** This project will seek to demonstrate that the involvement of basin stakeholders in watershed management is the key to the success. By engaging the Basin communities in a practical, "hands-on" manner, the identification and field testing of remedial measures, as well as in a dialogue process, actions formulated through the project process will benefit from these communal insights and experiences, and be far more acceptable to the communities as sustainable alternatives to current, destructive practices. Public involvement and participation is a real tool for insuring long term sustainability in Integrated Water Resources Management.

During the preparation process of the La Plata Framework Programme, specialized personnel were present to actively and responsibly include civil organizations in the process. This participative dimension strengthens Basin governance, and is present in each of the Components to be executed during the project, in particular in Component I which proposes a strategic program for stakeholder involvement and participation. Promoting public participation in this project is integral and transversal to the process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society—with special focus on gender equity and indigenous peoples. This involvement also will favor appropriations and the social sustainability of the SAP during both its formulation and implementation, consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

### ***Setting up negotiation round tables***

The experience in the region demonstrates that the management of basins is participative and operational management process through which a group of local and external actors act with the objective of obtaining mutual and equal benefits.

With that in mind, the action framework will be organized by conforming Negotiation Round Tables to support the intergrated water management plan as well as opportunities for dialogue and exchange among the

different actors during the present PPD. They will be composed by members representative of the interests, disposition, and decisions of politicians, inhabitants and users of the basin.

### ***Development of Participative Workshops***

This action was developed to design and implement a citizen participative process which will support the execution of the Integrated Management Plan. The final purpose of the participative process is the promotion of medium and long-term sustainability while following the policies established by both countries. The activities that will be implemented are:

- The implementation of a citizen participative process which would capture in an effective manner the different perspectives of local, regional, national, and international actors as well as interested and/or affected participants of the present PPD. This is essential to construct a complete local vision;
- The revision of the diverse actions of the PPD and the studies that socially legitimize the implementation of the PGI;
- The support of the diffusion of pertinent information related to the present PPD and the actions it is made up of;

Based on interviews, meetings, and participative workshops, that recognize and update the social perceptions associated to the application of management tools, a retro-alimentation of the design and adjustment of the execution of the various PPD actions can be achieved. Particular attention will be paid to the role of women, fomenting their participation in diverse basin activities.

### ***Diffusion and awareness of the PGI***

The objective of this action is the identification of the main content of the PPD with the purpose of strengthening the participative process and widening the spectrum of actors. This will permit the long-term legitimization of the developed management process in the framework of the PPD. With this in mind, a web page will be designed and synthesis documents will be elaborated. It is expected that at the end of each year the PGI will develop diffusion campaigns directed towards the general public.

### ***Education Program related to Water***

The elaboration of an education program specifically about water that would be implemented in schools of the basin region is envisaged. The program should be published with didactic material destined for children that would help them learn, understand, preserve, and value the natural habitat and social history of the Cuareim/Quaraí basin, and reaffirm their local identity. This publication would be complimentary to the Basin Atlas.

The activities to be implemented in the framework of this action include:

#### ***1. A course to educate educators***

This action will design educational and training activities destined to capacitate supervisors, principals, and teachers. These activities will be integrated into their formal education with the purpose of providing the necessary tools for educators to promote and develop in children and youths knowledge and consciousness in relation to the identified critical themes in the present consultancy.

#### ***2. Course for the efficient use of water***

This action is composed of 4 capacity building courses for producers in the basin area related to the management of water and the application of the "good practices" manual. This implies the distribution of written material as well as the understanding of fiscal and social benefits that the efficient use of water implies.

Two capacity training activities for local managers (municipalities, NGOs, producer associations, hotel owners, gas stations, service stations, and the general public) will be developed as a

compliment to the aforementioned courses. Their main purpose will be to achieve an improvement in the management of water, taking advantage of the capacities achieved with the PPD.

**2.18 M&E: Plan:** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed and comprehensive Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

#### PROCESS OUTCOMES AND INDICATORS

Process INDICATORS	
Outcome	Indicator
Binational agreement on transboundary priority concerns, impacts and causes	The Project will enhance Agreed mechanisms of concertation around transboundary issues
Binational Agreement on governance reforms and investments to address priority transboundary concerns	These are key issues to address priority transboundary concerns. The Project will propose an adequate institutional structure
Effective national Inter-ministry Coordination	This Coordination do exist and is improving
Stakeholder involvement in transboundary waterbody priority setting and strategic planning	The Project addresses the need for such mechanisms and will make proposal and implement actions
Binational waterbody legal framework adopted and/or strengthened	The whole Pilot Demonstration is being conceived under the Binational Cooperation Agreements that already exist
Newly established and/or strengthened (existing) transboundary waters institutions	The Project proposes the creation of basin commission on each country and at transboundary level
Financial sustainability of joint transboundary waters institutions	This issue shall be addressed during Project development

Process OUTCOMES	Process INDICATORS
Multi-country agreement on transboundary priority concerns, impact and cause	<ul style="list-style-type: none"> <li>- Establishment of formal coordination mechanisms between the Quaraí river Basin Committee (Grande do Sul River) and the federal state (Unión); Creation of the Cuareim river Basin Agency at a national level (Uruguay); Strengthened Local Coordination Committee of the Uruguayan-Brazilian Mixed Commission for the Development of the Cuareim/Quaraí River Basin. by the end of the project.</li> <li>- Creation of binational irrigation boards for the integrated irrigation management in the basin.</li> <li>- Development of micro-hydraulic measures of water capture and storage in urban areas by the end of the project;</li> <li>- Flood and drought contingency programs by the end of the project</li> <li>- Preparation of a formal educational and training by the end of the project program on water management in the basin by the end of the project.</li> </ul>

Process OUTCOMES	Process INDICATORS
Multi-country agreement on governance reforms and investment to address priority transboundary concern	<ul style="list-style-type: none"> <li>- Constitution of a group of the organizations of the civil society and the academic sector involved with the project and linked with the CIC for the improvement of the Basin.</li> <li>- Reports and minutes of meetings of the group.</li> </ul>
Effective national Inter-ministry Coordination	<ul style="list-style-type: none"> <li>- Inter-ministerial mechanism established at the national level to agree to the execution with the organization of the civil society and the academic sector.</li> <li>- Reports and minutes of meetings of the national groups.</li> </ul>
Stakeholder involvement	<ul style="list-style-type: none"> <li>- Increase awareness of and participation in the project activities through more than xx project developed and implemented. Workshops and meetings with local authorities, institutions, and stakeholders. Participants from indigenous communities.</li> <li>- Preparation and wide dissemination of project-related documentation and project-related activities through the fund for civil society.</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions	<ul style="list-style-type: none"> <li>- Cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>- Institutional strengthening (training and equipment) provided to institutions related to the stakeholder organization, communication and education.</li> </ul>
Financial sustainability of joint transboundary waters institutions	<ul style="list-style-type: none"> <li>- Countries recognize the role of the transboundary water institutions and provide the funds for their operation</li> </ul>

### Stress Reduction Outcomes and Indicators

Stress Reduction OUTCOMES in Pilot Demonstration	Stress Reduction INDICATORS (report vs. baseline if possible)
Water Use Conflict Reduction of water use conflicts due to the implementation of Adequate IWRM	Number of water rights concessions vs. percentages of uncontrolled water use

### Environmental/Water Resources Status Outcomes and Indicators

Environmental/Water Resources (& Socioeconomic) Status OUTCOMES for Pilot Demonstration	Environmental/Water Resources (& Socioeconomic) Status INDICATORS
Water use conflicts Improved aquatic biodiversity (ecological flows) Stakeholders wellbeing	<ul style="list-style-type: none"> <li>- Reduction of waste water contamination due to the implementation of IWRM (measured by water quality parameters)</li> <li>- Reduction of conflict degree, measured by the degree of command and control intervention mechanisms and fines applied</li> </ul>



**Annex 1: Logframe**

It should be noted that the baseline will be established within the first six months of project implementation.

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>MAIN OBJECTIVE</b></p> <p><i>Resolve water conflicts in the Rio Cuareim/Quarai Basin through conflict resolution to ensure sustainable environmental flows on the Brazil-Uruguay border</i></p>	<p>The Cuareim-Quarai River basin has a series of water conflicts resulting in insufficient flow to maintain the river and coastal ecosystems during dry periods. Conflicts arise due to competing demands between neighboring cities, use of scarce water resources for irrigated rice production and recreational use. Variable river flows due to periodic flooding and droughts as well as water quality issues exacerbate the problem. The pilot project seeks to resolve existing conflicts by developing an Integrated Management System for the basin, promote sustainable water use, improve coordination and integration of activities between both countries, and encourage water resource conservation practices.</p>	<p>-Improved inter-ministry cooperation and active public participation.</p> <p>-Binational environmental monitoring system is established</p> <p>-Stakeholders and local decision makers trained in sustainable water management practices.</p> <p>-Environmental monitoring plan and irrigation guidelines have been developed; land use plan and contingency plans for droughts and floods are designed and available for local authorities.</p>	<p>-Signed cooperation agreements between participating institutions.</p> <p>-Monitoring system coordinated, agreed upon, implemented and available to local stakeholders</p> <p>- Number of environmental education programs and training courses on sustainable water management practices; agenda and number of participants to courses and workshops.</p> <p>- Documents outlining binational management plans, proposed legal frameworks, and agreed-upon contingency measures.</p>	<p>-Brazil and Uruguay will actively coordinate efforts to resolve water conflicts</p> <p>-Both countries will share climatological and hydrological data</p> <p>-Local actors are interested in resolving water conflicts through formalized institutional means</p>

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>PURPOSE</b></p> <p><i>A replicable pilot demonstration project (PDP) that promotes locally based water conflict resolution and international water use cooperation in the la Plata Basin,</i></p>	<p>The PDP seeks to consolidate the current water management instruments, to design and implement an Integrated Water Resources Management Plan to be shared by Brazil and Uruguay in a basin-wide scale, addressing water use conflict resolution and environmental conservation, within the</p>	<p>-The Quarai River Basin Committee is established in the Brazilian state of Rio Grande do Sul and the Cuareim River Basin Agency is established in Uruguay</p> <p>- An Integrated Water Resources Management Plan for the Cuareim-</p>	<p>- National and/or State resolutions establishing the respective Basin committee and agency</p> <p>- Number and sectors of the stakeholders involved in the Local Coordination Committee, by Y1, Q3.</p> <p>- Management Plan</p>	<p>-Water conflict resolution programs can be replicated to other parts of the la Plata Region</p> <p>-Local stakeholders will willingly change habits to promote water conservation</p> <p>-Increased participation will make the project more</p>

<i>developed.</i>	<p>framework of the above-mentioned Cooperation Agreement. The outcome is a conflict resolution process in place for sustainable environmental flows in the bi-national Cuareim/Quarai river border between Brazil and Uruguay. The activities to be carried out will permit:</p> <ul style="list-style-type: none"> <li>- Development of an Integrated Management System for the basin which will include five.</li> <li>- Promotion of the sustainable use of the water to help solve water conflicts; and,</li> <li>- Promotion of the water resources conservation including environmental mitigation, water quality and biodiversity conservation, basin land use planning.</li> <li>- Coordination and execution arrangements for the PDP.</li> </ul>	<p>Quarai River Basin shared by Brazil and Uruguay is jointly developed and agreed upon</p> <ul style="list-style-type: none"> <li>- The Bi-national Commission of the Cuareim-Quarai River basin is strengthened, incorporating a PDP's Local Coordination Committee.</li> <li>- Technical unit is in place for the execution of the PDP</li> </ul>	<p>for the Cuareim-Quarai River Basin formulated and approved by the Bi-national Commission. Key actions implemented at the end of the PDP execution (Y3, Q4)</p> <ul style="list-style-type: none"> <li>- Document including methodologies and processes used to resolve competitive uses of water, available by Y3 Q4.</li> <li>- Resolution of the Gov. State of Rio Grande do Sul and resolution of the Gov. of Uruguay for the incorporation of a local coordination committee promulgated by Y1 Q4.</li> </ul> <p>Contracts established with technical personnel (Coordinator, Consultants and sub-contracts) by Y1, Q1.</p>	<p>sustainable.</p> <ul style="list-style-type: none"> <li>- Brazil and Uruguay governments' are interested to use and strength the existing bi-national Commission for the Cuareim-Quarai River Basin.</li> <li>- Both countries and local communities are interested to have a "alive" Cuareim-Quarai river, with enough water to sustain the river ecosystems and not contaminated.</li> </ul>
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List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Activity 1</b></p> <p><i>Implementation of an Integrated Management System</i></p>	<p>-This activity seeks to develop tools and mechanisms to support and improve local capacity for environmental management planning and water resource monitoring at the bi-national level, increasing local participation to resolve competitive water uses</p>	<p>-Management tools for water monitoring and institutional planning.</p> <p>- A bi-national environmental database designed and implemented including information on uses and quality of water.</p> <p>- 2 bi-national workshops and 4 national workshops and Negotiation Round Tables on</p>	<p>- 1 Document outlining joint operational guidelines for water rights; water capture and storage infrastructure systems; designs and feasibility studies for storage dams; and proposed irrigation board to manage irrigation policies, from Y1 through end of Y2</p> <p>-Database available to institutions and stakeholders, accessible to both countries by Y2, Q1</p> <p>- List with number of</p>	<p>-Uruguay and Brazil will agree to create bi-national institutions and standards</p> <p>-Local institutions and schools will be interested in adopting water management practices</p> <p>-Farming communities will participate in workshops and will adopt water conservation and planning practices</p>

		<p>competitive uses of water.</p> <p>-Environmental education and training programs conducted for local teachers, rice and cattle farmers and local communities; training programs for municipal and water management employees.</p>	<p>participants to training programs, educational manuals and training material, reports from workshops, Aid-memoires from meetings and Round Tables</p> <p>-Educational material published and locally distributed in sectors related to water uses from Y1 Q4 through end of Y3.</p>	
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List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Activity 2</b></p> <p><i>Assessment of water and land uses in project area</i></p>	<p>- This activity seeks to analyze and determine water and land uses in the project area so that conservation plans can be developed in critical areas</p>	<p>-Water and land use surveys to determine supply and demand of water are completed by Y3 Q1</p> <p>-Environmental monitoring system of water and land resources is implemented by end of Y3</p> <p>-Water efficiency and land use productivity plans are completed by Y2</p> <p>-Assessment of extreme events and development of contingency plans are completed by Y3, Q3.</p>	<p>-Technical reports of surveys and results, including environmental baseline</p> <p>-Monitoring system in place and running, data available in bi-national environmental database.</p> <p>- 2 documents of the plans prepared; institutional and legal arrangements to implement the plans, by Y2.</p> <p>-Document containing contingency plans and proposed institutional agreements to adopt contingency plans is available</p>	<p>-Monitoring systems will provide enough data to make informed decisions and plans about water and land use</p> <p>-Pilot project plans will be accepted by local communities as well as government institutions</p> <p>-Careful planning can both help conserve resources as well as increase productivity</p>

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
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<p><b>Activity 3</b></p> <p><i>Design and implementation of mechanisms for the conservation of natural resources</i></p>	<p>-This activity seeks to develop and implement measures to control and/or reduce over-exploitation of land and water resources through improved planning, and implementation of biodiversity conservation measures</p>	<p>-Measures to control over-exploitation of water and land resources are developed and available to relevant stakeholders</p> <p>-Biodiversity conservation program is designed and adopted by relevant institutions.</p> <p>-Land use plan and management proposals are developed and endorsed by local authorities, civil society, and communities.</p> <p>-Environmental flows technically defined and locally agreed</p> <p>-Decrease in water related conflicts.</p> <p>-Improved water quality and ecological flows.</p>	<p>-Document prepared and widely distributed outlining measures to control over exploitation of water and land resources, including results from water balances analysis, proposed erosion control measures, flow recovery in urban areas, eco-hydrological programs, and irrigation guidelines, by Y3.</p> <p>- One (1) Report including the results of trophic evaluations and environmental flow measurements, by Y3, Q3.</p> <p>-Updated register of rural and urban water uses available with the technical counterpart agencies.</p> <p>-Extreme event alert system, contingency plans, and guidelines for irrigation practices available by Y3, Q3</p> <p>-Technical reports on environmental flows for the Cuareim-Quarai River agreed by the Bi-national Commission for the Development of the Basin, by Y3,Q2.</p> <p>Number of water conflicts identified at the beginning and at the end of the PDP.</p> <p>-Technical reports of water quality/flows, biodiversity reports</p> <p>-Measured decrease in sedimentation, by Y3, Q4.</p>	<p>-Current water resource conservation efforts are not well organized nor comprehensive</p> <p>-Hydrological and land use evaluations of the project area will lay the groundwork for bi-national water and land conservation efforts</p> <p>-Local institutions and players will implement the recommendations and findings of the pilot project</p>
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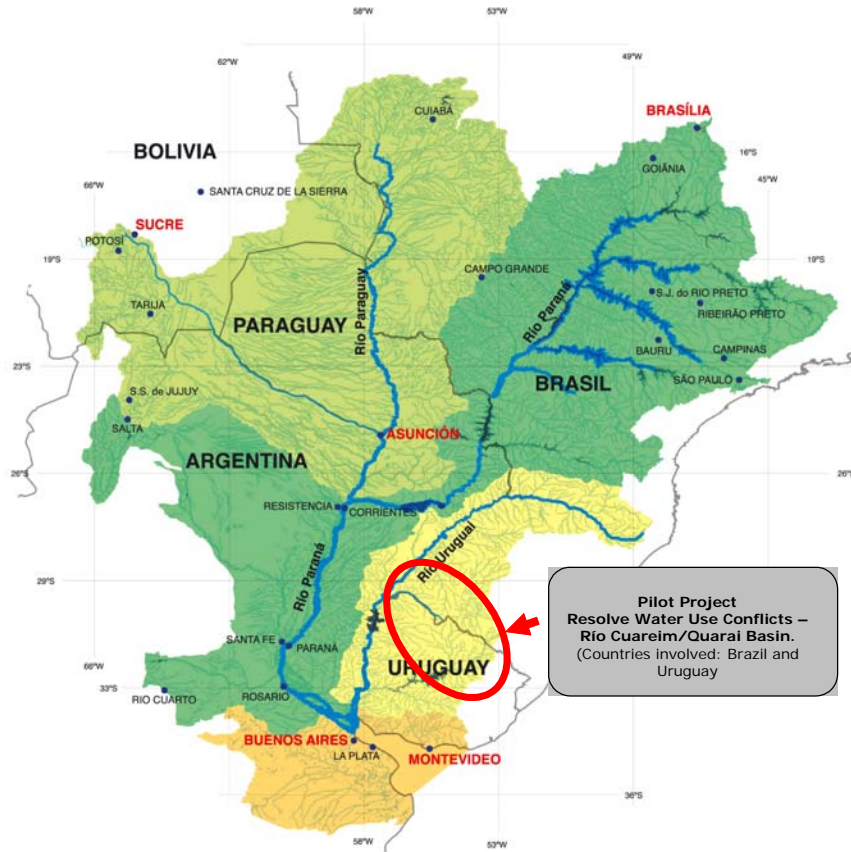
List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<p><b>Activity 4</b></p>	<p>This activity establishes proper institutional</p>	<p>- M&amp;E framework detailing supervisory roles,</p>	<p>-Document with M&amp;E Plan outlining management structure</p>	<p>-Lessons learned, recommendations for project sustainability,</p>

<p><i>Management and evaluation of pilot project</i></p>	<p>monitoring of project activities, including financial accountability, with a systematic follow-up of the components and activities carried out in the PDP, and evaluation of the replicability of the pilot project within the LPRB.</p> <p>-</p>	<p>financial oversight, and project coordination.</p> <ul style="list-style-type: none"> <li>- Institutional arrangements for a coordinated PDP under the LPRB Framework Program</li> <li>- M&amp;E plan to ensure efficient execution of the PDP developed and agreed upon</li> <li>- Evaluation of performance, achievements, and lessons learned.</li> <li>- PDP reports outlining project progress based on indicators.</li> <li>- Assessment of PDP replicability in the La Plata Basin, summary of achievements and lessons learned.</li> </ul>	<p>developed, agreed upon and available by Y1, Q1.</p> <ul style="list-style-type: none"> <li>- Agreement between CIC and national/local institutions for project execution signed by Y1, Q1.</li> <li>- Document evaluating the replicability of pilot project within the context of LPRB completed between Y3, Q4, with the identification of potential areas</li> <li>- Monthly, quarterly, half yearly and yearly reports prepared and available on line throughout project execution.</li> <li>- Mid term and final evaluation documents prepared and available on line.</li> </ul>	<p>and replicability of the pilot project will be correctly identified</p> <ul style="list-style-type: none"> <li>- Adaptive management ensures project management changes as necessary</li> <li>- The project is applicable to other areas of the la Plata Basin</li> </ul>
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Annex 2: Location Map

- Framework Program for the Sustainable Management of the Water Resources of the La Plata Basin -

**Priority Projects and Pilot Projects Location**

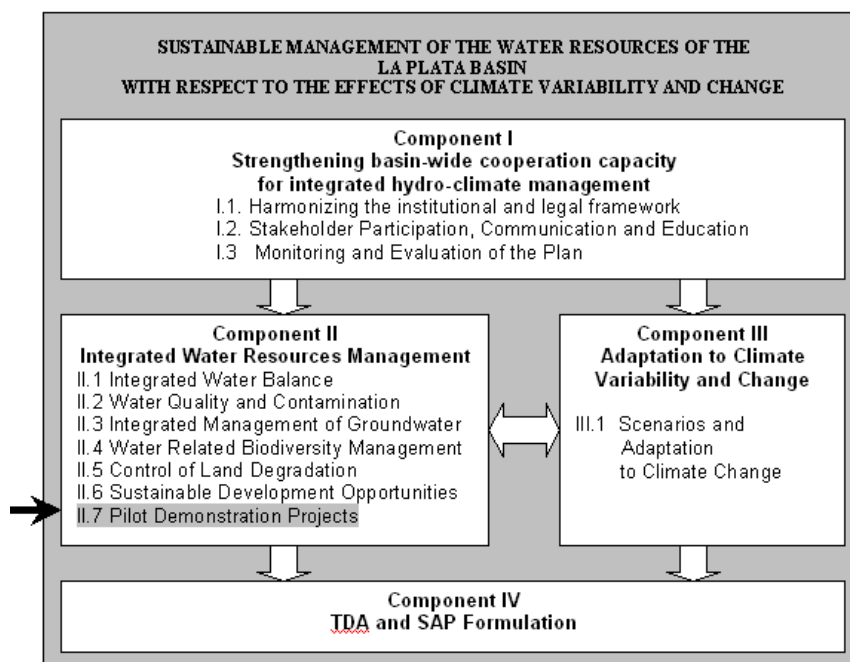


**SUB-COMPONENT  
II.7  
Pilot Demonstration Projects**

**Working Element II.7.4  
Pilot Project to Control Contamination and Erosion  
in the Cotaigaita Microbasin, at the Pilcomayo River Basin**

**Part 1: Project Identifiers –**

- 1.1 Sub-project title: Pilot Project to Control Contamination and Erosion in the Cotaigaita Microbasin, at the Pilcomayo River Basin
- 1.2 Link to umbrella project: Component II: Integrated Water Resources Management  
II.7 Pilot Demonstration Projects



- 1.3 Geographical scope: Cotagaita Sub basin  
Upper basin of the Pilcomayo River, Cotagaita Municipality, Nor Chichas Province of the Department of Potosí, Republic of Bolivia.  
Countries involved: Bolivia/Argentina/Paraguay.
- 1.4 Executing Agency/entity: CIC in cooperation with the Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas de Bolivia.
- 1.5 Duration: 3 Years
- 1.6 Focal area: IW
- 1.7 GEF grant: Total amount: US\$ 213,000
- 1.8 Co-financing: Total amount: US\$ 481,076
- Composed of Counterpart: US\$ 411,076 (in kind contributions from several institutions)  
CAF grant: US\$ 70,000 (cash)
- 1.9 Total funding: US\$ 694,076
- 1.10 Associated financing: - Pilcomayo Project US\$ 211,250

**1.11 Contact person:**

Name: Miguel Angel López Arzamendia  
 Title: CIC Secretary General and Project Director  
 Tel: (54-11) 431 22 506  
 Email: [secretaria@cicplata.org](mailto:secretaria@cicplata.org)

**1.12 Project summary:**

**The subcomponent objective is to** generate local management experience in reducing mining contamination and soil erosion, and sedimentation and water course sediment deposition in the Pilcomayo River Basin which extends itself within Bolivia, Argentina and Paraguay. The Pilot Project will be focused on a group of actions at the local level in the Cotagaita Sub-basin, situated in Bolivia, to reduce imminent contamination risks and, improve water quality and erosion control, as well as to obtain a replicable experience in control actions and contamination and erosion mitigation to be applied in other areas. The project contributes to improve knowledge of critical transboundary issues related to water quality and soil erosion, transport and sedimentation, taking into account the transboundary effects on Argentina and Paraguay located downstream. The outcome is sustainable soil conservation practices, implemented by more than sub-basin farmers, reforestation measures in the Cotagaita basin; and reduced mining contamination in the Tasna District are fully implemented by the end of the project

Subcomponent activities include the following:

1. Coordination and implementation of the execution arrangements ascertaining that the resources are made available on time and that the activities are initiated and terminated according to the Terms of Reference, expected quality and timetable, and ascertaining that reports are prepared and made available to Governments and stakeholders.
2. Control and mitigation of environmental goods from the Mining District of Tasna: building capacity to incorporate environmental adaptation in mining activities: (i) "Control and Environmental Mitigation of Tasna Buen Retiro Tailings Dam" Project: feasibility study and design of improvements of the drainage tunnel, water management and additional works (containing wall; covering of the platform of the dike, cross-cutting dikes for sand capture upstream of the main and secondary tunnels); (ii) search for financial support for the implementation of the Project; (iii) implementation of the Project; (iv) Implementation of community environmental management and development of human resources by a union of mining workers with knowledge and ability to institute environmental adaptation in the mining District of Tasna-Buen Retiro.
3. Control and mitigation of soil erosion and sedimentation of river bed: (i) Communities and their conservation leaders, as well as the municipal authorities and their technical teams, have the technical capacity and proactive attitude to find solutions for the control of soil erosion and promotion of sustainable development alternatives; (ii) Community agriculture workers develop a positive attitude towards sustainable development, consciously applying conservation, reforestation, and biomechanical practices.
4. System for monitoring water quality and sedimentation: (i) System for monitoring, evaluating and disseminating water quality and sediments set up and running.
5. Monitoring and evaluation: follow-up of all activities and evaluation of results.

**Summary Table of subcomponent Work Elements, Output and Outcomes**

Work Element	Output	Outcome
Pollution and Erosion Control Demonstration	Pilot Demonstration Project : Pollution and Erosion Control in the Cotagaita sub-basin of the Pilcomayo River <i>(20.000km<sup>2</sup>, 10.500 families)</i>	Sustainable soil conservation practices, implemented by more than 100 sub-basin farmers, reforestation measures in 40 areas of the Cotagaita basin; and a feasibility project to reduced mining contamination originated in the Tasna-Buen Retiro District, are fully



		implemented by the end of the project. 1/3 of the farmers informed and trained in sustainable agriculture practices, water and soil protection and reforestation.
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### Summary Table of subcomponent Work Elements, Sources of Funding, and Costs

Work Element	Source of Funds			Total Cost (US\$)
	GEF Funding (US\$)	Co-Financing (US\$)		
		CAF	COUNTERPART	
1. Coordination	30,000	10,000		40,000
2. Environmental liabilities from contamination		60,000	200,000	260,000
3. Erosion and Sedimentation	154,000		281,076	435,076
4. Water Quality and Sedimentation Monitoring System	50,000			50,000
5. Monitoring and evaluation	16,000			16,000
<b>TOTAL</b>	<b>213,000</b>	<b>70,000</b>	<b>481,076</b>	<b>694,076</b>

## Part 2: Project design

**2.1 Background and context:** The Pilcomayo River Basin is remarkable because of its critical contaminant levels arising from old mining activities in the region which started back in colonial times. The main contamination impacts are caused by the presence of heavy metals along the Pilcomayo River - and include contamination of river banks, reduction of the cultivated area, and decrease in the aquatic biodiversity. The Cotagaita River Basin is located upstream the Pilcomayo River, include an historical mining district with retained contaminants by a tailing dam under severe risk of collapse and highlands are deforested and under unsustainable agriculture use, causing strong anthropical land erosion.

The Pilcomayo basin generates a large quantity of sediments, on average 50 million m<sup>3</sup>, with average concentrations of 18 Kg/m<sup>3</sup> (in some place may go as high as 100 Kg/m<sup>3</sup>). The strong sediment loads have produced a recession of more than 70 km at its confluence with the Paraguay River. The high erosion and sedimentation are caused by various aspects which include exposure of erosive rocks, steep slopes, strong torrents in the upper basin occurring during the rainy season (from December to March), reduction of vegetation cover due to anthropogenic activities, and sensitivity of the terrain due its soil's lithological and physical-chemical characteristics. The main impacts are river sedimentation and recession, degradation of river slopes, and occurrence of vulnerable spots for river course diversion.

The Pilcomayo Pilot Project will focus on the sub basin of the Cotagaita River, an area under a strong familiar agricultural pressure and within the Mining District of Tasna-Buen Retiro Tailings Dam is located and shows risk of collapse, in Bolivia). The main reasons for selecting this specific study area are:

- (i) Presence of heavy metals (Pb, Cd, As, and others) along the Cotagaita river, with transboundary impacts in Ar and Py via the Pilcomayo River;
- (ii) Presence of the Tasna Buen Retiro Tailings Dam, located in the upper part of the Cotagaita basin, which requires immediate rehabilitation due to the contamination risks for communities downstream in the Basin and environmental liabilities;

- (iii) Presence of other environmental control and mitigation projects in the area (for example the COMIBOL and the Pilcomayo Project is currently monitoring water quality along the San Juan del Oro river); and
- (iv) Presence of irrigation agricultural activities along the Cotagaita river and the Pilaya River effluents. The region is characterized by good soils and favorable climatic conditions; however, productivity is compromised and jeopardized by mining contamination.

The Pilcomayo Pilot Project also includes educational and training activities, active public participation (to promote coordination and integration with the mining sector), and a water quality and sedimentation monitoring system (for the whole national and international river system).

These environmental aspects (water quality, soil erosion, and sedimentation) have negative impacts not only on the Upper Basin (in Bolivia), but also in the Lower Basin with impacts downstream on transboundary water bodies in Paraguay and Argentina.

Statement of Issue Water contamination, due primarily to past and present mining activities, and soil erosion and sedimentation are evidence of environmental problems in the Pilcomayo River basin. Among the main impacts of water contamination is the presence of heavy metals in sediments along the Pilcomayo River, causing the contamination of soil on the river banks, reduction of the area for cultivation, and loss of aquatic biodiversity.

In the area chosen for the implementation of this Pilot Project, two issues are of specific interest: first, the imminent contamination risks and environmental liabilities associated to the present situation of the Tasna Buen Retiro Tailings Dam and its components; second, the long-needed soil conservation practices, associated to the agricultural activity in the basin.

Among the main impacts of erosion and sedimentation, at the local and global levels, are flooding during rainy seasons, sedimentation of the river bed, erosion of river banks, and the recession of the river and the formation of critical points with a high probability of deviating the watercourse. All these impacts affect not only the upper basin but also the lower part of the basin. Therefore, these become transboundary problems among Bolivia, Paraguay and Argentina.

2.2 Pilot Sub-component objective: The purpose is to generate local management experience in reducing mining contamination and soil erosion, and sedimentation and water course sediment deposition in the Pilcomayo River. It will be focused on a group of actions at the local level (Cotagaita Sub-basin in Bolivia) to reduce imminent contamination risks and, improve water quality and erosion control, as well as to obtain a replicable experience in control actions and contamination and erosion mitigation to be applied in other areas. The project will contribute to improve knowledge of critical transboundary issues related to water quality and soil erosion, transport and sedimentation, taking into account the transboundary effects on Argentina and Paraguay located downstream.

2.3 Environmental benefits: This Pilot Project is important from the stand point of conservation and preservation of the integrity of the water resources of the Pilcomayo basin, because it focus on the causes of the problems; reduces the risk of collapse of environmental goods; contributes to environmental adaptation of current mining activities; reduces soil erosion and the sedimentation of the river beds; and provides for monitoring of water quality and sediments that are critical transboundary issues in the la Plata Basin.

In particular, it includes a variety of structural and non-structural actions such as pilot actions for reforestation, and erosion, sediment and contamination control and conservation practices. It is expected that these actions will bring, in the short term, an improvement of the Pilcomayo River System water quality.

In addition it will aim at the:

- Control and mitigation of environmental goods in the Mining District of Tasna Buen Retiro; education and capacity-building for environmental adaptation in mining activities, directly related to the component on integrated water resources management in the sub-component of water quality and to the component on public participation. Results can be replicated in similar areas in Bolivia and Argentina.
- Control and mitigation of erosion and sedimentation through participatory contests that will complement the monitoring of water quality and sediments in local and regional watercourses. Sediment control and

water quality are priority themes in the la Plata Basin, related to navigation, biodiversity and infrastructure, among others.

2.4 Overall sub-project Outcomes: The project will: (i) to promote the socioeconomic development and help to improve the quality of life of the population of the region which depends directly or indirectly on the water resources of the Pilcomayo River Basin; (ii) to generate positive environmental impacts and enhance economic production and development in the Pilcomayo Basin; (iii) to contribute to enhance knowledge and promote information exchange on critical transboundary issues related to water quality, soil erosion, transport, and sedimentation.

The expected project outcomes are:

- Improvement of the environmental safety control of the Tasna Buen Retiro Tailings Dam by managing and upgrading infrastructure and protection works including (drainage and supply channels, tunnels, walls, barriers, secondary channels, and others);
- Design and Implementation of an Environmental Management Program for the Tasna Mining District through active cooperation between local communities and mining cooperatives;
- Training and promotion of proactive attitudes to the community leaderships and municipal authorities (and technical teams) on soil erosion control and sustainable development;
- Implementation of sustainable farming and deforestation practices on communities and
- Monitoring and evaluation program on water quality and sediments executed and running.

2.5. Consistency of the sub-project with national/regional priorities and plans: There are several actions being implemented in the Pilcomayo basin with different environmental objectives. According to municipal regulations the municipalities have the responsibility to implement local projects with stakeholders' participation. The municipalities of Potosi and Chuquiaca, in coordination with their town halls, and with the support of the Danish Cooperation, are working on an Integrated Management Basin Plan and an Environmental Action Plan which includes multiple actions for the prevention, control and mitigation of mining contamination, as well as control and mitigation measures for erosion, sedimentation and other problems. The Tupiza and Cotagaita Integrated Management Basin Plans are located in the study area.

Mining activities require full compliance with Bolivian Environmental laws and policies. It includes accountability for the prevention and mitigation of environmental impacts. The Bolivian Mining Corporation (COMIBOL), during the 1960-80's represented by the Minería Grande, has been implementing Environmental Management Programs, performing studies and projects to improve mitigation and management of existing environmental liabilities in the Pilcomayo river basin. An example of an environmental management project being implemented in the study area is the Tasna Buen Retiro Tailings Dam.

Synergies between existing projects should occur to integrate and optimize priority actions on water quality improvement and sedimentation control. These include actions being performed by the Pilcomayo Project, the Ministry for Sustainable Development of Bolivia, the COMIBOL, and departmental town halls and municipalities of the three countries included in the PP Pilcomayo. These integrated initiatives will help to support the Pilcomayo Pilot Project.

The implementation of the Pilcomayo River Basin Master Plan is considered strategic and has received support by multiple stakeholders such as local governments, citizens (population), state and private institutions involved with the rivers and basin management (including the Intergovernmental Coordinating Committee (CIC) for the la Plata Basin). To promote joint and coordinated efforts it is recommended to organize inter-institutional meetings or workshops to gain interest, support, and commitment to the project.

2.6 Coordination and linkages to the umbrella project activities and other related activities in the basin: The Project "framework program for the Sustainable Management of La Plata Basin's Water Resources, in Relation with the Effects of Climate Variability and Change" aims to strengthen the efforts of the governments of Argentina, Bolivia, Brazil, Paraguay and Uruguay to implement their shared vision for the sustainable (environmental, social and economic) development and the protection of its water resources.

The baseline-Transboundary Diagnostic Analysis identified nine critical issues facing the countries and communities of the Plata Basin. Water quality degradation (due to organic and chemical contaminants coming from mining and industrial activities without adequate treatment) and sedimentation are among them with highest potential to reduce the utility of the waters of the Plata Basin. Current development trends show an increasing pressure over the natural resources that demands a water quality monitoring system. In addition, lack of common or shared standards and instrumentation to determine quality parameters, and limited control and monitoring networks in the five countries, have not allowed for a coherent and comprehensive water quality diagnostic. This diagnostic is required in order to better assess the causes and effects of transboundary environmental issues, and design strategies and identify measures to address them.

The Pilcomayo Pilot Project has been selected to promote a local management experience to reduce mining contamination, soil erosion and sedimentation in the Pilcomayo River. It includes a group of actions at the local level (in the Cotagaita basin in Bolivia) to conserve the integrity of the water resources of the Pilcomayo River Basin, improving water quality and erosion control. The project will contribute to improve the knowledge of critical transboundary issues related to water quality and soil erosion, transport and sedimentation, and transboundary impacts on Argentina and Paraguay (located downstream).

The Pilcomayo Pilot Project will focus on an area within the Mining District of Tasna Buen Retiro (area of influence defined by the Cotagaita sub-basin within the Pilaya River Basin in Bolivia). The main reasons for selecting this specific study area are:

- (v) Presence of heavy metals (Pb, Cd, As, and others) along the Cotagaita river;
- (vi) Presence of the Tasna Buen Retiro Tailings Dam, located in the upper part of the Cotagaita basin, with environmental impacts on the Blanco River;
- (vii) Presence of other environmental control and mitigation projects in the area (for example the COMIBOL and the Pilcomayo Project is currently monitoring water quality along the San Juan del Oro river); and
- (viii) Presence of irrigation agricultural activities along the Cotagaita river and the Pilaya River effluents. The region is characterized by good soils and favorable climatic conditions; however, productivity is compromised and jeopardized by mining contamination.

The Pilcomayo Pilot Project also includes educational and training activities, active public participation (to promote coordination and integration with the mining sector), and a water quality and sedimentation monitoring system (for the whole national and international river system).

The Pilcomayo pilot project should ideally work in close coordination with other important projects in the region such as: (i) the EU funded Integrated Management Project and Master Plan of Pilcomayo River Basin; (ii) the Strategic Action Plan of the Binational Bermejo River Basin (the GEF has supported the Bi-national Commission for the Development of Upper Bermejo River and Grande de Tarija River Basin [Argentina-Bolivia] in implementing a Strategic Action Plan for the Bermejo River (SAP-Bermejo) to promote sustainable development of this basin and mitigate the increases of the natural erosion by anthropogenic causes); (iii) the Project for Environmental Protection and Sustainable Development of the Guarani Aquifer System; (iv) the Strategic Action Program for the Management of the Pantanal and the Upper Paraguay River Basin; (v) the Sustainable Land Management in the Transboundary Ecosystem of the Gran Chaco Americano; and (vi) the Yrenda-Toba-Tarijeño Aquifer System (SAYTT). The framework program of the CIC is looking into coordinating all existing efforts under a consolidated management framework.

The European Union is cooperating with Argentina, Bolivia and Paraguay to elaborate a Master Plan for the Pilcomayo River basin. The Pilcomayo Project, named Project for the Integrated Management and Master Plan of the Rio Pilcomayo Basin, when it is completed in July, 2008, will have three main products: a set of generated information, lessons learned through the implementation of the Pilot Projects and the Basin Master Plan. However it could be improved in terms of providing an integrated framework to optimize efforts, use of human resources and financing. Hence the La Plata initiative will look into coordinating all existing efforts under a consolidated management framework.

In regards to the Pilot Projects, one expects to implement those related to soil erosion and sedimentation, soil conservation, mining contamination reduction, among other, which will be in close connection with the Activity 3 of this Pilot Project.

Regarding Activity 2. Environmental control and mitigation of liabilities from past and present mining contamination, it should be said that the Pilcomayo Project does not have a similar pilot project, and therefore the present Pilot Project will be of great value to the overall Project, since it will be taken as lessons learned and included in the Basin Master Plan

The lessons learned through Activity 3: Erosion and sedimentation, control and mitigation of soil erosion and riverbed sedimentation, will constitute a parallel pilot project together with others such as the integrated management of the Jatun Kaka basin, but its lessons will be also included in the Pilcomayo Master Plan.

The water quality and sediment monitoring and evaluation is considered in both frameworks, i.e., in the La Plata and in the Pilcomayo. On the other hand COMIBOL also does water quality monitoring at local level, at the mine locations.

Activity 4 is considered as a means of coordination among the three institutions that deal with water quality, to propose coordinated actions. Lessons learned from this Activity will all be included in the Master Plan

### 2.7 Incremental reasoning:

Baseline Current baseline shows that there are several studies and initiatives taken in the framework of the the European Unit Pilcomayo Project, the Program for the Environmental Management Plan (PASA), and environmental licensing program of Bolivia.

An example of it is the Project Environmental Liability Control at the Tasna Buen Retiro Dam, prepared by COMIBOL with the aide of the Danish Cooperation. This Project waits for implementation as funds are not available.

Additionally, erosion and sedimentation control also have been included in plans related to environmental management which can benefit from support of other interested institutions.

Water quality is an issue of permanent concern in the region due to the high contamination hazards such as heavy metals, so that it should be run continuously.

Increment The synergy that is generated by the association of multiple partners interested in developing solutions for the problems in the Cotagaita basin is the main point to be stressed as the increment associated with the Pilot Project.

Besides, the Pilot Project will allow the continuation of initiatives leading to the full implementation of the rehabilitation of the Tasna Buen Retiro Tailings Dam and other measures for erosion and sedimentation mitigation and control, in the Cotagaita sub-basin which have not been possible so far

Alternative If it were not for the Pilot Project, the feasibility study would continue to be supported by the the local institutions but eventually at a much slower pace,

Incremental reasoning The problems related to erosion and sedimentation are quite frequent in the region and in other parts of the Andean countries and even in other parts of the Globe. The methodology that has been applied in the La Plata framework program focuses on identification of priorities and means to tackle the problems taking into account the need for the participation of multiple actor and the public. The replication of the model once tested in the context of the present Pilot Project will certainly be beneficial to the management of a large number of similar problems around the world.

## 2.8 Activities – outputs – outcome:

Sub-component Objective & Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
To generate local management experience in reducing transboundary mining contamination, soil erosion and sedimentation, and water course sediment deposition, in the Pilcomayo River Basin, which spans Bolivia, Argentina and Paraguay	Integrated Management Plan for natural resources degradation control and mitigation, in the Cotagaita sub basin and the Pilcomayo basin	COMIBOL project identified for the Tasna Buen Retiro Tailings Dam	Local, national and trinational arrangements in the framework of the CIC, for the execution of the Pilot Project in place and working, by the end of the 1 <sup>st</sup> trimester.  50% advances in the execution of the Management Plan by the end of the 2 <sup>nd</sup> trimester of year 2.	100% of the management plan executed by the end of the 3 <sup>rd</sup> year. recommendation incorporated in the SAP
Sustainable soil conservation practices, implemented by more than 100 sub-basin farmers, reforestation measures in 44 areas at the Cotagaita sub-basin; and full implementation of a feasibility study to reduce the risk of mining contamination in the Tasna District	National and local institutions, as well as resources needed, are mobilized on time and in agreement with all stakeholders involved.	Local stakeholders are organized in a mining cooperative	Management unit of the Project operating in direct coordination with the national executing units and the framework program by the 2 <sup>nd</sup> trimester.	Pilot Project management locally sustain by the end of year 3
	Feasibility Study and design for the improvement of the environmental safety control of the Tasna Buen Retiro Tailings Dam (managing and upgrading infrastructure and protection works including drainage and supply channels, tunnels, walls, barriers, secondary channels, and others)	Initial study for infrastructure recuperation in COMIBOL and local Mining Cooperative	Design of solutions and study of alternatives to develop the feasibility study for the environmental safety control of the Tasna Buen Retiro Tailings Dam, at the end of the 1 <sup>st</sup> year. Search for financial support for the feasibility study by the end of year 2. -Training and final project activities by the end of year 3	Feasibility study for the environmental safety control of the Tasna Buen Retiro Tailings Dam has financial support for execution by the end of the Project and the experience is used to upscale the activity and as an input for the SAP.

Sub-component Objective & Outcomes	Description of indicator	Baseline level	Mid-term target	End-of-project target
	Pro-active attitude by farming communities towards sustainable development, conservation practices, biomechanics and reforestation.	Local; cooperative and farmers organization and national and municipal initiatives.	Local leaders, municipalities and 1/3 of the farmers informed and trained in sustainable agriculture practices, water and soil protection and reforestation, by the end of year 1. - Best practices manual for reducing mining contamination in the sub-basins and 4 training courses covering at least 100 families in total, by the end of the 2 <sup>nd</sup> year.	- Sustainable soil conservation practices and reforestation measures introduced in at least 44 farms by the end of the Pilot Project execution. - Demonstration project reports available at the basin level, the CIC Project Web Page, the IWRN node and on the IW.Learn platform.  Experience, lessons learned and best practices used as inputs to upgrade the LPB SAP.
	Monitoring and evaluation program on water quality and sediments executed and running	0	Technical capacity and pro-active attitudes for soil erosion control measures and sustainable development implemented and disseminated by communities and municipalities.	Evaluation of the Pilot Project available and used to prepare the SAP.

#### II.7.4 Pilot Demonstration: Pollution and Erosion Control in the Pilcomayo River

*Objective:* To generate local management experience in reducing mining contamination and soil erosion, and sedimentation and water course sediment deposition in the Cotaigaita sub-basin, part of the Pilcomayo River Basin, which extends itself within Bilivia, Argentina and Paraguay

*Outcome:* Sustainable soil conservation practices, implemented by more than sub-basin farmers, reforestation measures in the Cotagaita sub basin; and reduced mining contamination in the Tasna-Buen Retiro District are fully implemented by the end of the project

#### *Output II.7.4* Pilot Demonstration: Pollution and Erosion Control in the Pilcomayo River

##### *Activities*

- a) Establish pilot-demo coordination unit
- b) Identify control and mitigation measures for mine contamination in Tans and train Tasana stakeholders on environmental management systems
- c) Evaluate and approved integrated management plan for the Tupiza and Cotagaita basins
- d) Design and implement, in coordination with sub-component II.2, a water quality monitoring system for the pilot area

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Pilot Demonstration: Pollution and Erosion Control in the Cotaigaita sub-basib/Pilcomayo River	Integrated Management Plan for natural resources degradation control and mitigation, in the Cotaigaita sub basin and the Pilcomayo <b>basin</b>	<b>COMIBOL project identified for the Tasna Buen Retiro Tailings Dam</b>	Local, national and trinational arrangements in the framework of the CIC, for the execution of the Pilot Project in place and working, by the end of the 1 <sup>st</sup> trimester.  <b>50% advances in the execution of the of the Management Plan by the end of the 2<sup>nd</sup> trimester of year 2.</b>	<b>100% of the Management Plan executed by the end of the 3<sup>rd</sup> year, recommendations incorporated in the SAP</b>
a) Establish pilot-demo coordination unit				
This activity comprises all matters referring the implementation of the P. Project, considering its transboundary nature, and the fact that it must be developed in the context of several measures that are already under way, in the context of the associated Pilcomayo Project financed by the European Union (EU), and therefore the necessity to articulate agents and resources from three countries.	Trinational P. Project Technical Unit created in the framework of the CIC and in agreement with the Pilcomayo River Basin Trinational Comission (Ar, Bo and Py),.  Local organization agrees to excute the Pilot Project.	Pilcomayo EU's project and the Trinational Comission for the Pilcomayo River Basin	Trinational P. Project Technical Unit created, technical personnel hired, and working in coordination with the Trinational Commission, by the 1st trimester.	Personnel from the Trinational Project Unit participate in SAP preparation.
b) Identify control and mitigation measures for mine contamination of boundary waters, and train local stakeholders on env. basin management				
Feasibility study of the Project "Environmental Control and Mitigation of the Tasna Buen Retiro Tailings Dam" according to the following sub-activities:  - Review and update of the existing project documents and preparation of the feasibility study and bidding documents for the rehabilitation of the tailings dams for  - Procurement of financial support for its preparation, and implementation in the case that funds are made available	- Contacts and agreement with sources of financing for the project.  - Feasibility study for Tasna-Buen Retiro tailing Dam rehabilitation.  - Search for financial support for the implementation of the Project.  - Tasna-Buen Retiro Mining Association and farmer's	- Existing project documents for Tasna-Buen Retiro tailing dam rehabilitation.  - Some local entities have already manifested interest in co-financing the implementation of structure in the form of in-kind contributions	Feasibility study for Tasna-Buen Retiro tailing Dam rehabilitation, by the 3 <sup>rd</sup> year.  - 1/3 of the farmers informed and trained in sustainable agriculture practices, water and soil protection and reforestation, by the end of year 1.  - Sustainable soil conservation practices and reforestation measures introduced in at least 44 farms by the end of year 3.	- Implementation of the project in case financial resources are made available.  Lessons learned for upscaling the P. Project, to be used for the preparation of the TDA and the SAP.



Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
- -	organizations trained on issues regarding implementation of the Management Plan		- National contacts in Bolivia and international search for agreements to finance Tasna-Buen Retiro tailing dam's rehabilitation, initiated at the end of year 1, and ending at the end of year 3.	
c) Evaluate and approve the Integrated Management Plan for the basin				
- Evaluation and approval of the Integrated Management Plan for the Cotagaita sub basin, in the context of the Pilcomayo Basin. - -	- Meetings and workshops with local stakeholders, to prepare, discuss and approve the Integrated Basin Management Plan. - Incentives for farmers' conservation practices, biomechanics and reforestation, aimed at promoting awareness of the stakeholders and devising mechanisms for the involvement of key actors in the region. - Implementation of soil-water conservation practices, biomechanics and reforestation, including training on good agricultural and erosion and sedimentation abatement practices.	Local associations, farmers organizations, and national/departamental/municipal initiatives	Design of solutions and alternatives to prepare the feasibility study for the environmental safety control and rehabilitation of the Tasna Buen Retiro Tailings Dam, at the end of the 1 <sup>st</sup> year.  - Search for financial support for final the feasibility study, and end project execution by the end of year 2.  -Training activities and final project by the end of year 3  - 50% advances in the execution of the of the Management Plan by the end of the 2 <sup>nd</sup> trimester of year 2.	
d) Design and implement				



**Co-financing (US\$)**

Source	Type	Year 1	Year 2	Year 3	Total
Project Government Contribution	In kind	150,000	150,000	111,076	411,076
Multilateral Agency: Corporación Andina de Fomento - CAF	Cash	70,000			70,000
<b>TOTAL Co-financing</b>		<b>220,000</b>	<b>150,000</b>	<b>111,076</b>	<b>481,076</b>

**Consultants working for technical assistance components:**

Component	Estimated person weeks	GEF (\$)	CAF	Project total (\$)
Local consultants – US\$750/week	48	36,000	-	36,000
Local consultants – US\$1,000/week	16	16,000	10,000	26,000
Local consultants – US\$1,250/week	24	30,000	-	30,000
<b>Total</b>		<b>82,000</b>		<b>92,000</b>

**Consultants to be hired for the project**

Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
<b>For Technical Assistance</b>			
Local			
Consultant GEF 1.	1,250	24	LPFP Technical Advisor (GEF)
Consultant GEF 2	750	16	Soil conservation practices
Consultant GEF 3	750	16	Environment Management Program
Consultant GEF 4	750	16	Water quality and sedimentation follow-up
Consultant GEF 4	750	16	Water quality and sedimentation follow-up
Consultant CAF 1	1000	10	Project finance plan and procurement

**Sub-Contracts with Institutions**

Sub-Contracts	GEF (\$)	CAF (\$)	Tasks to be performed
<b>For Technical Assistance</b>			
Local			
Sub-Contract 1	50,000	-	Water quality monitoring

Sub-Contract 2		60,000	Preparation of bidding and project finance documents for the rehabilitation of the Tasna Buen Retiro Tailings Dam
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### 2.10 Timetable:

Activity / Sub-Activity	Year 1				Year 2				Year 3			
	1	2	3	4	1	2	3	4	1	2	3	4
<b>Activity 1.</b> Project coordination and execution arrangements												
<b>Activity 2:</b> Control and mitigation of mining contamination												
2.1 Feasibility study and design of the project "Control and environmental mitigation of Tailings Dam Tasna Buen Retiro"												
2.2 Search for financial support for the implementation of the project "Control and environmental mitigation of Tailings Dam Tasna Buen Retiro"												
2.3 Implementation of the project "Control and environmental mitigation of Tailings Dam Tasna Buen Retiro"												
2.4 Training of the Tasna Mining Association for the implementation of the environmental management system												
<b>Activity 3.</b> Project of management of renewable natural resources to reduce, control, and mitigate soil erosion and river contamination												
3.1 Evaluation and approval of the Integrated Management Plan for the Tupiza and Cotagaita basin												
3.2 Incentives to farmers for conservation practices, biomechanics and reforestation												
3.3 Implementation of conservation practices, biomechanics and reforestation												
<b>Activity 4.</b> Monitoring system for water quality and sedimentation												
4.1 Design and implementation												
4.2 Efficient and effective dissemination of results												
<b>Activity 5.</b> Monitoring and evaluation												
Final report												

### 2.12 Cost effectiveness:

This Pilot Project is based on the previous analysis that have been carried out of problems that affect a much larger area than that where they occur, such as water contamination and soil erosion and sedimentation, especially in this case, known for their uncommon scale. In fact, the Pilcomayo Basin extends itself over portions of Argentina, Bolivia and Paraguay. Dealing problems of this nature in such a scale is a challenge that requires considerable amount of financial and technical resources, in addition to consideration and coordination of different and complex legal and institutional aspects.

Taking a regional approach at the transboundary level, aiming at profiting from lessons learned elsewhere by applying them in a step-by-step fashion, the issues may be dealt with in a much more effective way as compared with alternative approaches of undertakings made on an individual or national basin. At the technical and economical level, this approach can be maximized by developing focused pilot interventions, in this case in a sub-basin, with a view that such interventions can be replicated at the whole basin level in conformity with regional guidelines and agreements.

On the basis of these considerations, measures of contamination and erosion and sedimentation control may and will be applied in an integrated way, in an adequate and smaller scale, in order to hold better control of the factors affecting the success of the initiative. Then, benefits become to be felt soon after as the measures are applied in the small scale, while at the same time capacity starts to build up. On the other

hand, the interest over the replicability possibilities of such pilot initiatives is very large. With time, this approach will allow the three countries to tackle capabilities and technical asymmetries, in a less costly fashion and with higher benefits, for the benefit of future joint developments.

The agreed strategy will consider aspects related to water and environment management, especially water quality, which may integrate other important issues at the whole basin level, involving communities. Consequently, countries will be able to share the results and reach a much more effective consensus about the solutions proposed for their common problem. The efforts and costs then become much more effective since both human and financial resources may be optimized and results obtained in a much larger scale.

Besides, by making information available, the three countries may benefit from the common experience and replicate it whenever similar cases occur, thus saving time and resources. This asset is even of greater importance if the experience is disseminated through GEF mechanisms such as the IW-Learn system, for the benefit of the global community.

### 2.13 Risk Analysis:

The Project was conceived in such a way as to have the participation of several governmental and private institutions, stakeholders and citizens, such as mining corporations, municipalities, and ngos, as well as of several international organizations such as CIC, OEA, Unión Europea- Proyecto Pilcomayo.

Under this circumstance, the successful execution of the Pilot Project depends largely on the capacity of the executing organizations, as well as on the organization and participation of local communities, since the donors have limited coordination capacity within the Framework Project arrangements.

Some assumptions involve the commitments such as:

- Bolivia's COMIBOL demonstrates effective involvement and collaboration.
- Inhabitants and stakeholders shown willingness in favour of strong appropriation of the demonstration project
- The Municipality of Cotagaita take appropriate measures to include the implementation of natural resources management practices to reduce erosion and silting, in its Annual Operating Plan
- Co-financing is available in the amount and time as needed to implement measures leading to the rehabilitation of the Tasna Buen Retiro Tailings Dam.

Some risks were then identified:

Risk	Rating (L/M/H)	Risk Mitigation Measures
1. Institutions do not shown continuous interest in the Pilot Project		Mobilize local stakeholders to lead to process and Project implementation
2. Local stakeholders shown low willingness to participate		Promote information on the expected outputs and outcomes of the Project and motivate participation
3. Funds do not arrive on time or are not sufficient		Monitor and act so that the funds are made available when and in the amount needed to implement the project
4. Nature of the problems requires technology that is not available locally		Monitor and evaluate reports and results, take corrective measures well in advance.

2.13 Sustainability: discussing a long-term sustainability plan once GEF funding has ceased laying down the premises for an "exit strategy" considering *inter alia* institutional, environmental and financial sustainability.

#### ***Institutional***

The Technical Office of Pilcomayo and Bermejo Rivers in Bolivia has installed technical and operational capacity. This could allow a close co-ordination with the Project "Integrated Management and Master Plan of Pilcomayo River Basin" and the SAP Bermejo, which have several contiguous activities with the present Project.

Within the CIC framework a specific organization will be implemented with the representation of three involved countries (Argentina, Bolivia and Paraguay). The structure will be defined during the project execution. It would provide institutional sustainability and be responsible of the policies and implementation plans concerning environmental management of the Pilcomayo river basin.

The sustainability of the project would also be provided through the involvement of the Intergovernmental Coordinating Committee of La Plata Countries (CIC), the countries, provinces/departments by its waters resources institutions and the universities.

### ***Environmental***

The project will support environmental management for erosion and contamination control in the Pilcomayo River Basin. It includes: (i) the project called "Tasna Buen Retiro Tail Dam Environmental Control and Mitigation" (for reducing the contamination and collapse risk of the passives in the mining district of Tasna); (ii) various communities where the farmers at their own initiatives are applying soil conservation practices, biomechanics, and reforestation in the Cotagaita Basin; (iii) reduction of the contamination of the liabilities in the mining district of Tasna Buen Retiro; (iv) processes of soil erosion and river sedimentation controlled with conservationist practices, reforestation and bio-techniques and; (v) increased number of people using conservationist practices to counteract the effects of deforestation, erosion and water contamination by the local social players at the end of the Project.

The project will support development of a comprehensive information database within the Pilcomayo River system, developed through participation of various national, bilateral and international programs focusing on soil degradation in critical zones. It will include erosion mitigation and soil recovery measures with the respective monitoring system, as well as public education and awareness mechanisms defined and implemented.

### ***Financial***

The framework program is an initiative of Argentina, Bolivia, Brazil, Paraguay and Uruguay for the integrated management of the water resources of La Plata Basin. The Intergovernmental Committee of La Plata Basin Countries (CIC) will be the local executing agency; the Organization of the American States (OAS) will be the executing agency; and the United Nations Environmental Program (UNEP) will be the implementing agency. The PP-Pilcomayo will be financed by Global Environmental Facility (GEF), FONPLATA, and by the countries as counterparts.

#### 2.14 Replicability: discussing up scaling strategy especially for demo projects and SPA measures

It is important to emphasize the interrelationship of the PP- Pilcomayo with the different components of the framework program, and the importance of the replicability of the Pilot Project to other potentially sensitive locations in La Plata Basin (specially erosion and sedimentation). Replicability of the project execution will be assured through its incorporation into the framework program.

The Project has a strong social and technical components and will develop strategies that are transferable to the Plata Basin and that help: (i) to preserve the integrity of the water resources system of the Pilcomayo River basin, improving water quality and erosion control, to obtain a replicable experience in control actions and contamination and erosion mitigation; and ii) to improve knowledge of critical transboundary issues related to water quality and soil erosion, transport and sedimentation, taking into account the transboundary effects on Argentina and Paraguay located downstream.

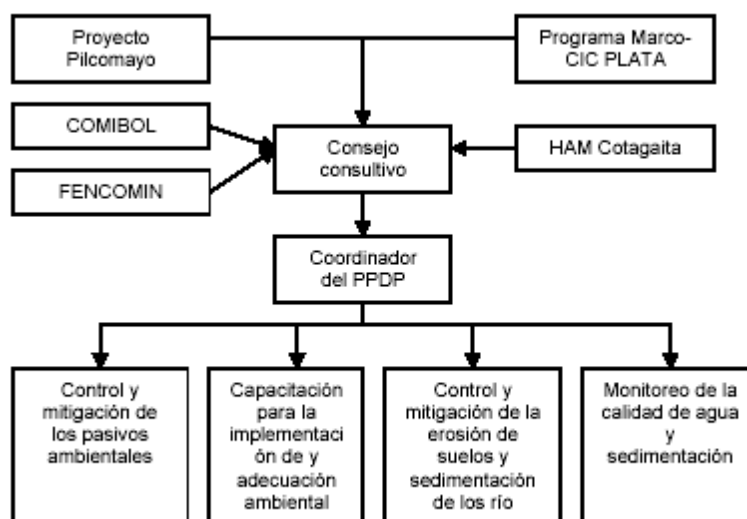
#### 2.15 Execution arrangement: including an organigram chart outlining links with the PCU

The project is related to and generates synergy with actions being executed by the Pilcomayo Project financed by the European Union. The Pilcomayo project has already an installed and working infrastructure which includes offices, equipment, and an information database to help the execution, operation, and monitoring of the PP-Pilcomayo.

The Director of the PP-Pilcomayo project is the Director of the framework program (also Secretary of the CIC). The technical office will be in Tarija, Bolivia, at the Technical Office of Pilcomayo and Bermejo Rivers.

The International Technical Coordinator of the PP-Pilcomayo will be elected following the methodology established for the framework program, and will coordinate the consultants and the tasks from the technical office in Tarija. The International Technical Coordinator of the PP-Pilcomayo is responsible for the execution of the project and will depend technically of the International Technical Coordination of the framework program. Routine and frequent coordination meetings will be held. OAS as executing agency will perform the financial administration of the framework program.

Organizational structure for the Pilot Project Development:



The project should be developed with national and local human resources to guarantee sustainability of the project. Consulting activities should be minimized in order to strengthen local capacities. Consulting should be for support/coordination, but with specific scopes and limited timeframes.

Strong participation of universities and specialized institutes in Bolivia, Argentina and Paraguay will be encouraged, including graduate study scholarships.

The administrative part will be carried out by the Pilcomayo Project (with support of the Technical Office of Tarija) in coordination with the framework program. There will be a Consultive Council with the participation of the involved institutions: the HAM of Cotagaita, the COMIBOL, the FENCOMIN, the Pilcomayo Project and the framework program. The progress reports will be approved by the council. The International Project Coordinator of the PP Pilcomayo will be responsible for the coordination.

Table below illustrates participating institutions for each component.

Activity	Involved Institutions
2. Control and mitigation of the past and present mining contamination	framework program– CIC-PLATA, Ministry of Water Resources of Bolivia, Ministry of Sustainable Development and Planning of Bolivia, Potosi Town Hall and COMIBOL, FENCOMIN, Cotagaita Municipality.
3. Soil erosion, reduced, controlled and mitigated river sedimentation	framework program– CIC-PLATA, Ministry of Sustainable Development and Planning of Bolivia, Potosi Town Hall and Community of Tupiza, Atocha and Cotagaita and the Cotagaita Municipality, Ministry of Water Resources of Bolivia.
4. Sediments and water quality evaluation and monitoring system	framework program– CIC-PLATA, Ministry of Sustainable Development and Planning of Bolivia, Potosi Town Hall and COMIBOL, Cotagaita Municipality, Ministry of Water

	Resources of Bolivia.
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### 2.16 Public participation mechanisms:

This project will seek to demonstrate that the involvement of basin stakeholders in watershed management is the key to the success. In fact, there is already a strong participation by local stakeholders from the Cotagaita Municipality, among them agriculture workers, in the on-going Pilcomayo Project financed by the European Union. An essential aspect is to include in the project the gender issue and to promote the participation of woman.

By engaging the Basin communities in a practical, "hands-on" manner, the identification and field testing of remedial measures, as well as in a dialogue process, actions formulated through the project process will benefit from these communal insights and experiences, and be far more acceptable to the communities as sustainable alternatives to current, destructive practices. Public involvement and participation is a real tool for insuring long term sustainability in Integrated Water Resources Management.

During the preparation process of the La Plata framework programme, specialized personnel were present to actively and responsibly include civil organizations in the process. This participative dimension strengthens Basin governance, and is present in each of the Components to be executed during the project, in particular in Component I of the La Plata framework programme which proposes a strategic program for stakeholder involvement and participation. Promoting public participation in this pilot project is therefore a part of that process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society—with special focus on gender equity and indigenous peoples. This involvement also will favor appropriations and the social sustainability of the SAP during both its formulation and implementation, consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

### 2.17 M&E:

#### The M &E Plan

The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations.

A detailed and comprehensive Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

### **Performance and Achievement Indicators and means of verification**

Indicator/ Description	Parameters measured	Baseline value	Means of Verification
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Indicator/ Description	Parameters measured	Baseline value	Means of Verification
Tasna Buen Retiro Tail Dam Environmental Control and Mitigation Project Application of soil conservation practices Passives contamination Soil erosion and river sedimentation control practices	Water drainage tunnel implementation progress Community leaders trained in conservation practices, and erosion and sedimentation control practices Mining cooperative's staff trained in environmental conservation practices	N/A	Project progress and final reports In-situ verification of control-infrastructures completed Training programs and attendance reports

Process INDICATORS		
Process Outcomes		Process Indicators
Binational agreement on transboundary priority concerns, impacts and causes		The Project will enhance Agreed mechanisms of cooperation around transboundary issues
Binational Agreement on governance reforms and investments to address priority transboundary concerns		These are key issues to address priority transboundary concerns. The Project will propose an adequate institutional structure
Effective national Inter-ministry Coordination		This Coordination do exist and is improving
Stakeholder involvement in transboundary waterbody priority setting and strategic planning		The Project addresses the need for such mechanisms and will make proposal and implement actions
Binational waterbody legal framework adopted and/or strengthened		The whole Pilot Project is being conceived under the Binational Cooperation Agreements that already exist
Newly established and/or strengthened (existing) transboundary waters institutions		The Project proposes the creation of basin commission on each country and at transboundary level
Financial sustainability of joint transboundary waters institutions		This issue shall be addressed during Project development

Process OUTCOMES	Process INDICATORS
Multi-country agreement on transboundary priority concerns, impact and cause	<ul style="list-style-type: none"> <li>- The project called "Tasna Buen Retiro Tailings Dam Environmental Control and Mitigation" (reducing contamination and legacy pollutant in the mining district of Tasna) fully implemented by the end of the project;</li> <li>- Soil conservation practices implemented in more than 44 farmer communities by the end of the project</li> <li>- Reforestation at specific sites in the Cotagaita basin by the end of the Project;</li> <li>- Reduction of the legacy pollutants in the mining district of Tasna Buen Retiro by 95% by the end the Project at this specific site;</li> <li>- Processes of soil erosion and river sedimentation and</li> </ul>

Process OUTCOMES	Process INDICATORS
	silting controlled with conservation practices, reforestation and biotechnologies by the end of the Project, in specific localities; <ul style="list-style-type: none"> <li>- Increased number of people using conservation practices to counteract the effects of deforestation, erosion and water silting and contamination by the local social players by the end of the Project.</li> </ul>
Multi-country agreement on governance reforms and investment to address priority transboundary concern	<ul style="list-style-type: none"> <li>- Constitution of a group of the organizations of the civil society and the private sector involved with the project and linked with the CIC for the improvement of the Basin.</li> <li>- Reports and minutes of meetings of the group.</li> </ul>
Effective national Inter-ministry Coordination	<ul style="list-style-type: none"> <li>- Inter-ministerial mechanism established at the national level to agree to the execution with the organization of the civil society and private sector.</li> <li>- Reports and minutes of meetings of the national groups.</li> </ul>
Stakeholder involvement	<ul style="list-style-type: none"> <li>- Increase awareness of and participation in the project activities through more than xx project developed and implemented. XX workshops and meetings with local authorities, institutions, and stakeholders. Participants from indigenous communities.</li> <li>- Preparation and wide dissemination of project-related documentation and project-related activities</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions	<ul style="list-style-type: none"> <li>- cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>- Institutional strengthening (training and equipment) provided to institutions related to the stakeholder organization, communication and education.</li> </ul>
Financial sustainability of joint transboundary waters institutions	<ul style="list-style-type: none"> <li>- Countries recognize the role of the transboundary water institutions and provide the funds for their operation</li> </ul>

### Stress Reduction Outcomes and Indicators

Stress Reduction OUTCOMES in Pilot Project	Stress Reduction INDICATORS (report vs. baseline if possible)
Mining Contamination Risk reduction for population and environment	Tasna Buen Retiro Tailings Dam rehabilitated. Number of properties adopting conservation practices. Hectares of reforested land.

### Environmental/Water Resources Status Outcomes and Indicators

Environmental/Water Resources (& Socioeconomic) Status OUTCOMES for Pilot Project	Environmental/Water Resources (& Socioeconomic) Status INDICATORS
Mining Contamination Environmental health	- Control of erosion and downstream contamination, measured by sedimentation and water quality parameters (monitoring system)

Annex 1: Location Map

- Framework Program for the Sustainable Management of the Water Resources of the La Plata Basin -

***Priority Projects and Pilot Projects Location***



**Annex 2: Logframe**

It should be noted that the baseline will be established within the first six months of project implementation.

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<b>Main Objective</b>  <i>Mining contamination reduced, soil erosion mitigated, and sedimentation reduced in the Cotaigaita micro basin.</i>	<ul style="list-style-type: none"> <li>- Implementation of a Pilot Demonstration Project (PDP) to reduce mining contamination, mitigate land erosion and reduce river sedimentation in the Cotaigaita micro basin.</li> <li>- Building on an assessment of the PDP experience, formulation of a replication strategy as input to the SAP formulation.</li> </ul>	<ul style="list-style-type: none"> <li>- Documented agreed strategic good practices to reduce mining contamination, mitigate land erosion and reduce river sedimentation by the end of the PDP execution (3rd. Year). Records of the dissemination throughout the micro basin by the end of the PDP execution (3rd. Year)</li> <li>- Documented replication strategy including experience notes for use by the project community the hemisphere via IWRN and worldwide via IW:LEARN at the end of the 3rd. year</li> <li>- Documented inputs into the SAP.</li> <li>- Documented records of the PDP experience dissemination throughout the micro-basin, the Plata basin and possibly worldwide taking advantage of IW:LEARN.</li> </ul>	<ul style="list-style-type: none"> <li>- Agreed strategic good practices and lessons learned documents and experience notes available on the project website and through the IWRN nodes and the IW:LEARN website.</li> <li>- A replication strategy available on the project website.</li> <li>- Strategic actions to reduce mining contamination, mitigate land erosion and reduce river sedimentation included in the SAP.</li> <li>- Number of hits on the project website, the IWRN node and IW:LEARN demonstrating access and interest in the experience generated by this PDP.</li> </ul>	<ul style="list-style-type: none"> <li>-Risks are low due to high level of interest from all parties</li> <li>-Most effective way to improve water quality is through promotion of sustainable mining and agricultural practices in local communities.</li> <li>- The Gov. of Bolivia, Argentina and Paraguay are interested to implement the PDP, and will support the execution.</li> <li>-CIC will ensure adequate coordination of the project and CAF will co-finance de PDP.</li> <li>- The use of the PDP findings and its uptake for the SAP formulation will adequately be coordinated by the Project Coordination Unit.</li> </ul>

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<b>Purpose</b>  <i>A replicable pilot project that promotes public participation to</i>	<ul style="list-style-type: none"> <li>- Formulation of an “Integrated Management Plan for the Control and Mitigation of soil erosion and mining pollution in the Cotaigaita micro basin</li> </ul>	<ul style="list-style-type: none"> <li>- An agreed Environmental Management Program for the Tasna Mining District prepared through a participatory process.</li> </ul>	<ul style="list-style-type: none"> <li>- Agreed Integrated Management Plan available on the project website.</li> <li>- Update and complementary studies to determine the</li> </ul>	<ul style="list-style-type: none"> <li>-International, national, and local institutions support the project.</li> <li>-Sufficient information and technical capacity to prepare the integrated management</li> </ul>

<i>reduce soil erosion and mining contamination in the la Plata Basin.</i>	of the Pilcomayo River Basin, which includes policies for decreasing mining contamination, encourage sustainable farming practices, and monitoring water quality as well as enhancing local participation to: - promote sustainable management of mining resources around the Tasna-Buen Retiro Dam. - Limit soil erosion and sedimentation through sustainable agriculture and reforestation. - design and implement a water quality monitoring system.	- Update and complementary studies to determine the contamination fluxes from the Cotaigaita into the Pilcomayo River.  - Feasibility study for the rehabilitation of the Tasna Dam by Y 2  - Technical group established to implement the PDP, working with local institutions and stakeholders.	contamination fluxes from the Cotaigaita into the Pilcomayo River and feasibility study for the rehabilitation of the Tasna Dam available on the project website and used as an input to the Tasna Mining Environmental Management Program  - Records of technical group meetings and consultations with stakeholders available on the project website.	plan  - The PDP is replicable in other parts of the LPRB.  - Local stakeholders are committed to working and resolve the contamination and erosion issues in the Cotaigaita micro basin, and national and sub-national institutions are willing to support PDP activities.
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List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<b>Activity 1</b>  <i>Environmental contamination from the Tasna Mining District controlled and mitigated</i>	- Building local capacity to incorporate environmental protection measures in mining activities through the preparation of feasibility studies and testing of measures such as drainage tunnel, waste water management techniques, building of containing walls, dike platform protection, cross-cutting dikes for upstream sand capture and secondary tunnels for the environmental protection and mitigation of Tasna Buen Retiro Tailings Dam  - Secure additional financial resources to cover the cost of additional structural measures - Implementation of community	- Established base line information (parameters and concentrations) on contaminants in the Cotaigaita River  - Designed and agreed feasibility study by Y1, Q4 and successful testing of environmental protection measures in the Tasna Buen Retiro Dam including drainage tunnel improvements, waste water management techniques, containing wall construction, dike platform protection, cross-cutting dikes construction, etc  - Environmental training program designed and the Tasna Mining Association staff trained during Y2 and Y3.	- Water Quality report cards/assessments available on the project website - Documented baseline information on contamination available on the project website.  - Feasibility studies as well as testing reports available on the project website.  - Reports documenting the number of courses, workshops and participants available on the project website.  - Reports on secured additional financial resources to cover the cost of additional structural measures available on the project website.  - Documented trends in the Rehabilitation of	- Local players and the Tasna Mining Association are interested in the rehabilitation of dam and environmental protection  - Additional financing will be secured  - The project will count on the Support of the Ministry of Water Resources of Bolivia, Potosi Town Hall, COMIBOL, FENCOMIN, and the Cotaigaita Municipality

environmental management measures and capacity strengthening of the mining workers union in the Mining District of Tasna.	-Secured additional financial resources to cover the cost of additional structural measures by Y2, Q4.	Tasna Tailings Dam water drainage tunnel available on the project website.
	-Rehabilitated Dam.	
	-Decreased environmental contamination risk from mining activities.	

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<b>Activity 2</b>  <i>Management plan to control and mitigate soil erosion and sedimentation in the Cotaigaita Basin river formulated and under implementation.</i>	Participatory formulation and implementation of an “Integrated Management Plan for the Tupiza and Cotaigaita Basin” that will include inter alia a menu of measures with respect to soil conservation, reforestation, and sustainable farming measures.	<ul style="list-style-type: none"> <li>-Diagnostic report on the causes of soil erosion and sedimentation in the river basin by Y1, Q2</li> <li>-Inventory of agricultural communities and reforestation sites.</li> <li>-Agreed Integrated Management Plan for the Tupiza and Cotaigaita Basin by Y1, Q2</li> <li>-Development of incentive plans for farmers to practice conservation, biologically based farming techniques, and reforestation by Y1, Q4.</li> <li>-Sustainable agriculture workshops, conservation projects in place in at least 44 agricultural communities.</li> <li>- Reforestation occurring on selected degraded sites by Y2, Q1 to Y3, Q4.</li> <li>- Assessment of the</li> </ul>	<ul style="list-style-type: none"> <li>- Diagnostic report available on the project web site.</li> <li>-Integrated Management Plan and related Institutional agreements supporting it available on the project website</li> <li>-Incentive plan report available on the project website.</li> <li>- Reports of Sustainable agriculture workshops including number of participants etc as well as manuals prepared available on the project website.</li> <li>- Reports documenting the number of hectares reforested, increased number of properties adopting conservation techniques available on the project website.</li> <li>-Document of the assessment of benefits and recommendations for upscaling available on the project website.</li> <li>-Reports of soil sample tests, crop surveys</li> </ul>	<ul style="list-style-type: none"> <li>-Soil erosion and sedimentation are caused in part by human activity</li> <li>-Institutional and local interests exists to reduce soil erosion</li> <li>-With proper incentives and training, farmers will implement environmentally sustainable techniques</li> </ul>

reforestation and forestation benefits, for future expansion.

available on the project website.

-Increased soil quality and crop yields by end of Y3

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<b>Activity 3</b> <i>Water quality and sedimentation monitoring system designed and operational</i>	Design and implementation of a water quality and sedimentation monitoring system	<ul style="list-style-type: none"> <li>- Documented design for an improved water quality and sedimentation monitoring system by the end of Y1.</li> <li>- Water quality and sedimentation data collected in support of the establishment of a baseline and technical reports during Y2 and Y3.</li> <li>- Water quality and sedimentation assessment reports prepared to document environment quality trends and changes over time during Y2 and Y3.</li> <li>- Mechanism to disseminate water quality and sedimentation results to local communities and municipal authorities from Y2, Q2 to Y3, Q4</li> </ul>	<ul style="list-style-type: none"> <li>-- Documented design for an improved water quality and sedimentation monitoring system available on the project website</li> <li>- Water quality and sedimentation database accessible by the demo project coordination unit and hyperlinked to the project website.</li> <li>-Assessment and baseline reports available on the project website</li> <li>- Dissemination strategy available on the project website</li> <li>- Periodic bulletin, brochures, etc available on the project website</li> </ul>	<ul style="list-style-type: none"> <li>-Local technical office will take responsibility for implementation and water quality monitoring</li> <li>-EU Pilcomayo Project water quality monitoring proposal can be adapted to the Cotaigaita Basin</li> </ul>

List of Objectives	Narrative Summary	Indicators	Means of Verification	Assumptions
<b>Activity 4</b> <i>Monitoring and evaluation of the PDP.</i>	<ul style="list-style-type: none"> <li>- Adequate substantive and financial project monitoring, reporting and evaluation according to the UNEP requirements.</li> <li>- Evaluation of the replicability of the</li> </ul>	<ul style="list-style-type: none"> <li>-Within two months of execution, revised and further quantified PDP project documentation, documented in the overall project Inception Report.</li> <li>-Revised and detailed</li> </ul>	<ul style="list-style-type: none"> <li>-Revised PDP documents available on the project website</li> <li>- Monthly, quarterly, half year and yearly</li> </ul>	<ul style="list-style-type: none"> <li>-Lessons learned, recommendations for project sustainability, and replicability of the pilot project will be correctly used by local stakeholders</li> </ul>

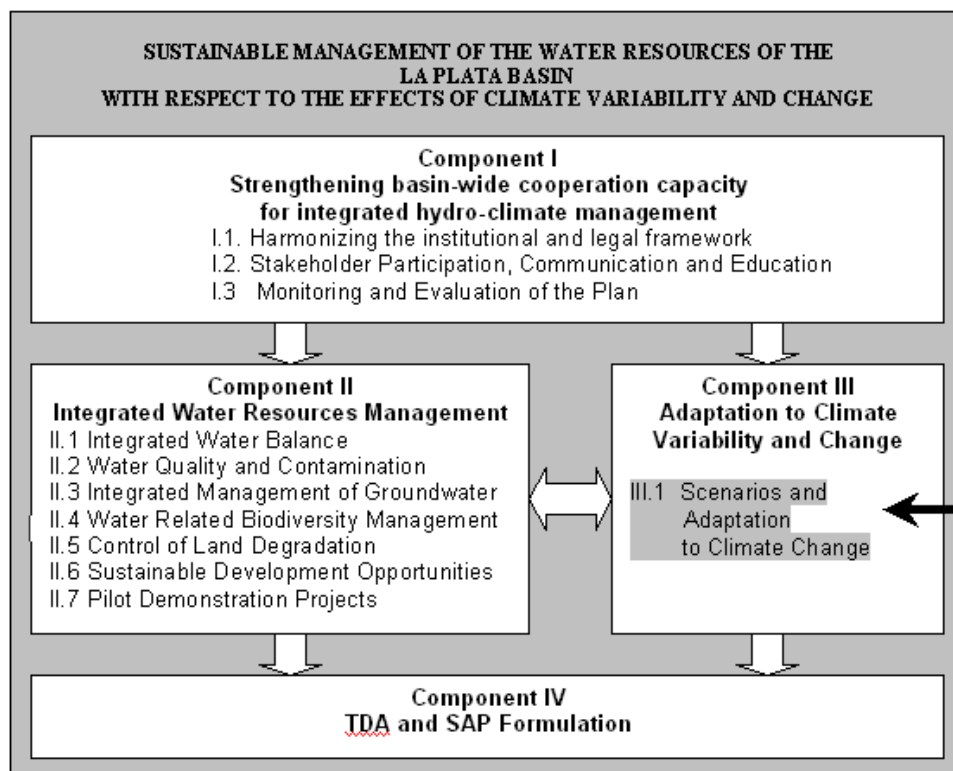
pilot project within the LPRB.	logframe , M&E plan, budget, procurement plan, TORs for each activity and Personnel prepared within 2 months of PDP execution.	reports , MTE, FE available on the project website
- Annual costed Plan of Operation prepared	-Recruitment of the Technical Coordinator to be hosted by the technical office of the Pilcomayo and Bermejo Rivers within one month of PDP execution.	-Replication strategy available on the project website
	-Reports documenting progress, evaluation of performance (MTE/FE), achievements, lessons learned.	BP and Lessons learnt reports available on the project website
	- Assessment of the PDP replicability in other parts of the La Plata Basin, and lessons learned.	



**COMPONENT III**  
**HYDROCLIMATIC MODELS AND SCENARIOS FOR ADAPTATION PLANNING**  
**Hydro-climatic scenarios**

**Part 1: Project Identifiers**

- 1.1 Sub-component title:** Hydro-climatic Models and Scenarios for Adaptation Planning  
**1.2 Link to umbrella project:** Component III: Hydro-climatic Models and Scenarios for Adaptation Planning



- 1.3 Geographical scope:** La Plata Basin  
**1.4 Executing Agency/entity:** CIC in cooperation with the following national institutions:  
 Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.  
 Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.  
 Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).  
 Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.  
 Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).  
**1.5 Duration:** 5 years  
**1.6 Focal area(s):** IW and SPA  
**1.7 GEF grant:** \$ 900.000

**1.8 Co-financing:** \$15,419,150

Including the approved EU project FP7-ENV-2007-1 Proposal Nr. 212492 Claris LBP "A Europe-South American Network for Climate Change Assessment and Impact Studies in La Plata Basin"

**1.9 Total funding:** \$16,319,150**1.10 Associated financing:** None**1.11 Contact person:**

Name: Miguel Angel López Arzamendia  
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 Tel: (54-11) 431 22 506  
 Email: [secretaria@cicplata.org](mailto:secretaria@cicplata.org)

**1.12 Project summary:**

Adaptation to Climate Variability and Change is comprised of one foundational activity: developing an Integrated Hydro-climatic projection system at the Basin level to generate hydrological and climatic scenarios. The **objective** of this subcomponent is to enhance the capacity of the basin countries to anticipate and adapt to climate change and variability related impacts. The outcome, the riparian countries' capacity to better understand climate variability related impacts, identified through the hydro-climatic scenarios, enables countries to better inform stakeholders on opportunities to address basin challenges. Such opportunities will be enhanced, in addition, through the formulation of the SAP, which will permit the Basin countries to access Climate Change Adaptation funds for specific implementation projects. The five Basin countries have published their initial National Communications (NCs) in response to the UNFCCC requirements; Paraguay, Argentina and Brazil have or are completing their Second National Communications (SNCs) which recommend implementation of programs to prepare policies and strategies for identifying measures and responses to climatic variability and change. In particular, the SNCs recommend capacity building and institutional strengthening measures necessary to integrate climate change concerns into regional planning scenarios. This project, and its specific activities geared toward enhancing the capacity of basin countries to anticipate and adapt to climate change, directly complements these SNCs.

Specifically, Component III will focus on activities related to adaptation to climate change and variability by the Basin countries by creating an Integrated Hydro-climatic Projection System at the Basin level. This basin-wide projection system would build on the riparian countries' existing systems and their regional programs for the basin. Although, the information system would be hosted at the CIC, the system program would build on specific expertise of the riparian countries (regional leading climatic scientific centers), which would each act as centers of excellence on specific issues. In addition to a long-term, model-based projection and monitoring system, this activity will look at the data gap and will coordinate the formulation of a climate change vulnerability assessment including vulnerability maps.

### Summary Table of Work Elements, Outputs and Outcomes

Work Elements	Output	Outcome
III.1. Regional Climate Scenario	Basin-wide climate scenarios	Hydrologic risk models and hydro-climatic scenarios available for basin-wide adaptation planning for the LPB
III.1.2 Vulnerability assessment	Vulnerability Assessment	The vulnerability assessment and hydrologic alert risk map, based on the hydro-climatic scenarios provide basis estimating climate change impact in the LPB
III.1.3. Adaptation measures and public	Adaptation measures and public awareness	Through the basin-wide communication and outreach effort stakeholder and institutions participate in identifying and formulating adaptation

awareness		measures to be included in the SAP
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### Summary Table of Work Elements, Sources of Funding and Total Costs

Work Elements	Sources of funding				Total Cost (US\$)
	GEF Funding (US\$)		Co-financing (#) (US\$)		
III.1.1. Development and use of Regional Climate Scenario	\$350,000	16%	\$5,000,000	84%	\$5,350,000
III.1.2. Vulnerability assessment	\$300,000	16%	\$5,000,000	84%	\$5,300,000
III.1.3. Adaptation measures and public awareness	\$250,000	8%	\$5,419,150	92%	\$5,669,150
<b>TOTAL</b>	<b>\$900,000</b>	<b>17%</b>	<b>\$15,419,150</b>	<b>83%</b>	<b>\$16,319,150</b>

## Part 2: Project design

### 2.1 Background and context:

Background and introduction The La Plata River Basin is the most important economic and demographic region of South America. The environment is threatened by urbanization, deforestation, soil loss and land degradation, poorly-controlled discharges of urban, industrial, and mining activities and agricultural contaminants, and its enormous hydropower potential is being used by numerous dams, including some of the world's largest.

The climatic and the hydrological features of the La Plata Basin have shown strong trends in precipitation and even larger percentage changes in the basin stream flows in the last 40 years. Negative consequences such as increasing rainfall and runoff in the La Plata Basin have generated larger and more frequent destructive floods in this period, particularly in the Paraguay and Parana system, and lead to more flood-drought cycles in the western part of the basin.

The most recent climate scenarios developed for the Fourth Assessment Report of the IPCC project anticipate important changes of temperature over most of the La Plata Basin. Although these changes depend on the greenhouse gas emissions and on the time horizon, the temperature increase would be from 2 to 4° C in the upcoming 100 years, in sub-regions where most of the stream flows of the Plata basin are generated. It is anticipated that this warming will lead to higher evaporation. In contrast, however, precipitation changes are expected to be small, amounting to no larger than 100 mm in the annual average over the Plata basin by the end of the century. Accordingly, it is unlikely that the effects of greater evaporation, due to temperature increase, will be compensated by higher precipitation. Instead, considerable reductions in runoff, river stream flow, and water stress on the productive landscape are expected. It is important to note though, that as in other regions of the world affected by climate change, certain zones within the basin are experiencing observed increases in extreme participation trends.

The Basin is in a complex climate region, with important “gaps” in the available data, which generate uncertainties for the modeling of spatial, temporal and global interrelations. The climate is nevertheless a determining factor for the heterogeneous hydrological system.

Changes in the rainfall patterns and temperature increase call for obvious adaptation to the present and likely future conditions. Such changes, exacerbated by unsustainable human activities, are indeed having a significant impact on the population and economic development of this mega basin and on the vulnerability of its ecosystems, e.g. on the wetland system. Due to the low slope gradient and extended plains, the central part of the basin, e.g. at the confluence of the

Parana/Paraguay systems, is prone to repeated heavy floods. The relatively scarce rainfalls and high evaporation levels define the arid and semiarid zones to the west (Grand Chaco Americano), while strong rainfalls and runoff, due in part to deforestation, characterize the northeastern zones.

The Basin has somehow shown ad-hoc de facto adaptation to its new climatic conditions. During the last 40 years, changes in precipitation and stream flow in the Plata Basin favored hydroelectric power generation over the Paraná and Uruguay rivers and their tributaries, with dams having produced notably more energy than expected at the time of their design. Likewise, some regions in Argentina, Bolivia and Paraguay witnessed a change of land use due increased rainfall in areas once covered by semi-arid forest ecosystems. Cultivation of soybean crops and expansion of livestock development have contributed to an improved present sub-regional economy, but without consideration for soil and biodiversity losses and the negative impacts of climatic change.

However, should the changes forecasted in the hydrology of the La Plata Basin become a reality, considerable negative impacts would be wrought upon the economy, human life and the extended basin environment. Significant changes are predicted for the wetland system from the Pantanal in the North, to the Delta of the Parana and the Plata River in the South, and from the Andean slopes in the West, to the Chaco plains and the Atlantic forest in the East. In particular, the Basin-wide generation of hydroelectric power would be reduced. This, however, is the main source of electricity for Brazil (90 %) and Uruguay and the only one for Paraguay. Navigation would be rendered difficult in some stretches of the river and the quality of the water supply in the semiarid west of the Plata Basin would also be jeopardized with significant recrudescence of water born diseases. Winter droughts in large areas of the semiarid west of the Plata Basin have already become more frequent during the last years.

All of the above likely changes as well as the current inherent forecasting uncertainties including uncertainties of the current scenarios need to be addressed. Therefore, this project is proposing beyond a Basin-wide Projection System, a series of adaptation measures in different hotspot areas that would support the design of a Plata forecasting system. Such proposed adaptation measures would in turn contribute to the formulation of a Basin-wide SAP including a comprehensive program of adaptation measures and necessary legal and institutional reforms.

Statement of Issues During the project development process, a series of climate change scenarios were developed that indicated that climatic variability, related to the El Nino/La Nina periodicities, and its dominant influence over the hydrology of the la Plata Basin. This is in contrast to the situation prevailing in the Amazon River Basin, located immediately to the north of the La Plata Basin, which is more severely influenced by anthropogenic factors. Variability in rainfall affects land use and soil loss, and has the potential to upset of delicate balance between precipitation and evaporation in the Basin. At the Basin level, this variability has the potential to increase the risk of flooding, especially when rainfalls consistently exceed historical means.

As a consequence of increasing concentrations of greenhouse gases in the atmosphere, temperatures also are expected to increase by between 2°C and 5°C. Higher temperatures have resulted in increased evaporation, and this increase is likely to offset the increase in precipitation to the extent that the models forecast a greater likelihood of drought in the Basin, especially in the *Chaco*. The net effect of the temperature changes, when viewed in light of the expected changes in rainfall, is an increased risk of extreme events, as runoff becomes more “flashy” or erratic. This reduction in available moisture due to higher evaporation, and reduced runoff has a significant potential to impact human economic activities dependent on rainfall and runoff. In particular, these likely decreases in mean annual runoff have the potential to seriously reduce the availability of hydroelectric power generation potentials. As hydroelectric power currently supports much of the economic development in the five Basin countries, the forecast changes in rainfall and runoff

represent serious threats to sustainable economic development, as suggested by the data from the Parana River Basin in north-eastern Argentina.

The important risk identified by the baseline Transboundary Diagnostic Analysis is the prevalence of extreme hydrologic events linked to climate variability and change, particularly in terms of the more frequent, longer and intense floods and extensive droughts, which periodically affect some Basin communities as a consequence of the El Nino/La Nina periodicities, with devastating social, economic and environmental effects. "Gaps" in climatic data and climate knowledge were identified with their consequent limitations on efficiently modeling climatic variability and mitigating climate change effects. Improvement in this forecasting capacity is very important in managing for climate change, identifying dangers and addressing vulnerabilities under new climate and hydrological scenarios. The addition of gases, such as carbon dioxide, to the atmosphere through forest fires and crop burns (slash and burn practices) must be included as an element contributing to climate change in the Basin.

In order to better understand these risks, as well as the opportunities that changes in rainfall and runoff may represent, it is essential to further refine the global climate models that have, to date, been utilized to develop these scenarios. To this end, acquisition of more complete data on current hydrometeorological conditions in the La Plata Basin forms an important element of this project. These data will contribute to the development of Basin-specific models.

2.2 Subcomponent objective: Adaptation to climate change is comprised of one foundational activity: developing an Integrated Hydro-climatic projection System at the Basin level to generate hydrological and climatic scenarios.

The objective of this Component is to enhance the capacity of the basin countries to anticipate and adapt to climate change and variability related impacts.

2.3 Environmental benefits: The improvements in the hydroclimatic projection system will allow for the evaluation of hydrological and climatic scenarios and will enhance the capacity of the Basin countries to anticipate and adapt to the impacts of change and variability in climate. It will have a direct and positive impact in the application of contingency plans related to flood and drought and other extreme events as well as to the generation of electricity and, agricultural production among other results.

2.4 Overall sub Component Outcome: The outcome of this Component, through the formulation of the SAP, will permit the Basin countries to access Climate Change Adaptation funds for specific implementation projects. The five Basin countries have published their initial National Communications (NCs) in response to the UNFCCC requirements; Paraguay, Argentina and Brazil have or are completing their Second National Communications (SNCs) which recommend implementation of programs to prepare policies and strategies for identifying measures and responses to climatic variability and change. In particular, the SNCs recommend capacity building and institutional strengthening measures necessary to integrate climate change concerns into regional planning scenarios. This project, and its specific activities geared toward enhancing the capacity of basin countries to anticipate and adapt to climate change, directly complements these SNCs.

Specifically, Component III will focus on activities related to adaptation to climate change and variability by the Basin countries by creating an Integrated Hydro-climatic Projection System at the Basin level. Such Basin-wide Projection system would build on the riparian countries' existing systems and their regional programs for the La Plata Basin. Although, the information system would be hosted at the CIC, the system would build on specific expertise of the riparian countries (regional leading climatic scientific centers) which would each act as centers of excellence on specific issues. In addition to a long-term model-based projection and monitoring system, this

activity will look at the data gap and will coordinate the formulation of a climate change vulnerability assessment including vulnerability maps.

2.5. Consistency of the sub-project with national/regional priorities and plans: The five Basin countries have adopted a National Communication (NC) pursuant to the requirements of the United Nations Framework Convention on Climate Change (UNFCCC), with Argentina and Uruguay completing their Second National Communications (SNCs), setting forth not only national responses to climate change and variability but also proposing a regional approach to this shared concern. The activities set forth herein are wholly consistent with the regional approach and recommended strategy of institutional strengthening, capacity building, and scenario-response generation identified in the NCs and SNCs of the Basin countries. GEF support of these actions is identified in decisions 6/CP.7 and 7/CP.7 of the Convention of the Parties (COP).

2.6 Coordination and linkages to the umbrella project activities and other related activities in the basin: Recently, project FP7-ENV-2007-1 Proposal Nr. 212492 Claris LBP “A Europe-South America Network for Climate Change Assessment and Impact Studies in La Plata Basin” was approved, which is directly related the themes being develop within this subcomponent. Moreover, there are many national projects involving the subject matter considered in the present study.

### 2.7 Incremental reasoning:

Baseline The Basin is a complex climate region, with important “gaps” in the available data, which generate uncertainties for the modeling of spatial, temporal and global interrelations. This situation is also a determining factor for the heterogeneous hydrological system.

In order to better understand these risks, as well as the opportunities that changes in rainfall and runoff may represent, it is essential to further refine the global climate models that have, to date, been utilized to develop these scenarios. To this end, analysis of more complete data on current hydrometeorological conditions in the La Plata Basin forms an important element of this project. This information will contribute to the development of Basin-specific models.

Various national institutions (CIMA in Argentina, CPTEC and USPE in Brazil and Universidad de la Republica in Uruguay) are involved in the development of climatic scenarios by means of downscaling techniques. Each institution is using different regional and global models, however there is currently no joint effort to gather the results of the various regional and global models. The use of an ensemble of all of the available models from the various scientific institutions of the region would reduce the uncertainty of the analysis and would offer the communicational advantage of a single unified result by the regional scientific community. At the hydrologic modeling level, the institutions are using subbasin level models for the CIMA (AR) and IPH (BR). None of these models have been connected at the regional level with the climatic models.

Increment Ensemble of available regional climate scenarios resulting from various combinations of global and regional models, consolidated by the different academic institutes that work in the theme. Collection of hydrological regional scenarios.

Incremental reasoning The collection technique for the development of scenarios allows for the reduction in the level of uncertainty within the models by compensating for errors within the different models. This process will be analyzed within the joint framework of the different regional agencies and will allow for a product with less uncertainty. It will offer the communicational advantage of a single unified result arrived at through consensus within the scientific community of the Basin. This would lead to improvements in vulnerability assessment and in the planning concerning the adaptation to change within the different sectors

## 2.8 Working Elements – Outputs – Outcome:

Project objective	Description of Output indicator	Baseline level	Mid-term target	End-of-project target
To enhance the capacity of the basin countries to anticipate and adapt to climate change and variability related impacts.	Ensemble of regional climate and hydrological projections at basin level	Isolated climate scenarios developed in the countries either from ensembles of global model outputs or single runs of regional models in the three countries. - LPB hydrological data and information managed at the country level. - Climate change studies and gap analysis for the LPB status, from a panel of experts of universities of: Ar, Br, Ur and the USA (Ca. and My.).	Institutional arrangements at the CIC framework in a system to produce a consensual ensemble of regional climate and hydrological scenarios for LPB, based on regional models nested on global models. - Coordination tools at the CIC with academic institutions of the LPB and with LPB-EU project (co-financing) to access and share information, assessments, CC models and technical capabilities, by the 1 <sup>st</sup> year. - Historical LPB's hydroclimatic information integrated in a coherent and operative system. - National and sub national institutions and organizations from the 5 riparian countries trained to participate. - Partner's institutions and projects formally involved bringing information and scientific knowledge.	- System in place to include scenarios of probability functions of relevant hydrological variables for the LPB, information for prevent and adapt to climate change and variability accessible for decision making and the SAP. - Regional capacity building to produce regional climate and hydrological scenarios in all the CIC countries. - Key users of water resources in the LPB are concerned and interested in scientifically and technically identified vulnerabilities as well as adaptation measures to climate variability and change at the basin wide scale. - Communication tools available and reports posted on the Project Web page, IWRN node and IW-Learn.
	Assessment of vulnerability to climate change in some representative cases	- Risk maps of present climate in part of the flood valley of the Paraguay river. - General assessment of vulnerability to climate change in some sectors and regions developed during SCN enabling activities.	- Assessment with quantitative indicators focused on representative cases of vulnerability to climate change covering the issues of : - firm energy of hydroelectric facilities -urban vulnerability to the most frequent intense rains - agriculture - floods and droughts	- Mid-term target plus risk maps in the more important flood valleys of the Paraná and Paraguay rivers. - Information and awareness accessible for vulnerable communities and activities, - Contingency plans completed and adopted by stakeholders in the Pilot Project for <i>Alert System at the Confluence of the Paraguay and Parana River</i> up scaling for LPB.

Project objective	Description of Output indicator	Baseline level	Mid-term target	End-of-project target
	Adaptation measures for agriculture, water supply and intense rains	<ul style="list-style-type: none"> <li>- Low general public awareness on climate change impacts.</li> <li>- Autonomous adaptation in the agriculture sector.</li> <li>- Reactive adaptation to increased floods.</li> </ul>	First report on measures and policies in representative cases to: <ul style="list-style-type: none"> <li>- palliate incomplete adaptations in agriculture</li> <li>- overcome water supply problems</li> <li>- mitigate the effects of extreme rainfall events</li> </ul>	<ul style="list-style-type: none"> <li>- High awareness in the stakeholders related to agriculture, water supply and intense rain.</li> </ul> Measures and policies developed for representative cases to: <ul style="list-style-type: none"> <li>palliate incomplete adaptations in agriculture</li> <li>overcome water supply problems</li> <li>mitigate the effects of extreme rainfall events.</li> <li>- Adaptation measures for water related sectors (hydro-energy, water supply and sanitation; navigation, agriculture/irrigation and tourism) identified and prepared for the SAP.</li> </ul>

### III.1. Hydroclimatic Models and Scenarios for Adaptation Planning

*Objective:* To develop climate and hydrological regional scenarios to be used in the study of vulnerability and adaptation.

*Outcome:* Periodic updating of regional climate change scenarios of LPB

*Activities:*

- a) Plan and provide training for climate issues
- b) Complete a basin-wide gap analysis of basin models
- c) Using the LPB-CLARIS model, develop hydro-climatic scenarios for the LPB

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Output III.1 Basin-wide climate scenarios	Ensemble of regional climate and hydrological projections at basin level	Isolated climate scenarios developed in the countries either from ensembles of global model outputs or single runs of regional models in the three countries	- Integrated works and mid term report on hydroclimatic previsions for LPB.	Mid-term target plus system improvement to include scenarios of probability functions of relevant hydrological variables. Strengthened capacity in all CIC countries to produce regional climate and hydrological scenarios
a) Plan and provide training for climate issues				
	Coordination workshop to produce climate and hydrological scenarios in LPB.	LPB EU project (LPB-CLARIS model)	Definition of the details of a program of climate and hydrological scenario development in LPB in the context of climate change including the adoption of institutional responsibilities, by the end of the 2nd quarter.	Capacity building plan executed and services improved..
	Intensive courses on climate scenarios	National staff in hydro and climatic institutions and services; organizations of the civil society and	International LPB training course for national services involved in the activity (40 participants from 40 national and sub-national institutions, by the 2 <sup>nd</sup> quarter.	40 institutions, services and organizations from the 5 riparian countries trained by courses and by preparing LPB integrated climate scenarios to identify



Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
		private sector interested in climate change vulnerabilities		vulnerabilities and major social, economical and environmental risks.
b) Complete a basin-wide gap analysis of basin model				
	-Assessment of regional performance of Global Climate Models - Downscaling with regional models - Ensemble of regional climate projections - Coordination of different climate projections	CLARIS' Panel report about LPB model's gaps	- Document identifying the gaps between global models for the LPB and needs to resolve the gaps, by the end of year 2.  - Information and inputs about climate change vulnerabilities and risk for LPB used in the TDA	Regional climate projections to facilitate decision-making regarding adaptation measures at a regional and national level.
c) Using the LPB-CLARIS model, develop hydro-climatic scenarios for the LPB				
	- Assessment of distributed hydrological models - Assessment of models of stream parameters related to water management. - Ensemble of regional water scenarios	LPB EU project and CLARIS panel report about climate change impacts and previsions.	- First integration of LPB hydroclimatic scenarios (short, mid and long term),	Regional scenarios of probability function of maximum, medium and minimum flows, permanence curve and regularization curve for at least 6 regions.  - Hydro climatic scenarios used in the TDA and SAP and publicly disseminated.

### III.1.2 Vulnerability assessment

*Objective:* To assess vulnerability to climate change in some representative water related cases

*Outcome:* Basic information for long term water resource management and planning and mitigation of the effects of climate change.

*Output III.1.2 Vulnerability Assessment*

*Activities:* a) Prepare hydrological alert risk map from hydro-climatic scenarios  
b) Estimate climate change impacts

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Vulnerability Assessment	Assessment of vulnerability to climate change in some representative cases	Risk maps of present climate in part of the flood valley of the Paraguay river. General assessment of vulnerability to climate change in	Risk maps produced at a scale of 1:100.000 and 1:250.000 for particular areas).  - Assessment with quantitative	Mid-term target plus risk maps for selected flood valleys of the Paraná and Paraguay rivers. - Vulnerabilities and risk mitigation measures identified and mapped are used in the preparation of the SAP

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
		some sectors and regions developed during SCN enabling activities.	indicators focused on representative cases of vulnerability to climate change covering the issues of - firm energy of hydroelectric facilities -urban vulnerability to the most frequent intense rains - agriculture -floods - Assessment available for TDA preparation	
a) Prepare hydrological alert risk map from hydro-climatic scenarios				
	- Improvement of identification of areas vulnerable to flooding and water risk mapping - Development of a common methodology for Water Risk Area. Progressive implementation plan to Delimit Water Risk Areas at a suitable scale	LPB EU project and CLARIS panel climate change reports	- Mapping Sc. 1:100.000 and 1:250.000 and updated damage survey for particular areas . - Methodological guide to delimit Water Risk Areas. - Single vertical coordinate for LPB or hydrometric heights harmonization	- GIS information and documents informing vulnerabilities and risk for areas and sector disseminated and used for the TDA and SAP.
b) Estimate climate change impacts				
	Estimation of potential climate change impacts in pilot areas and subjects: - Estimation of potential impacts on the firm energy of hydroelectric facilities. - Assessment of urban vulnerability to the most frequent intense rains. - Estimation of climate change impacts on agriculture. - Estimation of potential changes in floods.	LPB EU project and CLARIS panel climate change reports	- Assessment of vulnerability to climate change in representative cases. - Assessment of vulnerability to climate change available for the TDA	Assessment of vulnerability to climate change available, used for TDA and SAP, and disseminated publicly

### III.1.3. Adaptation measures and public awareness

*Objective:* To develop plans for adaptation to climate change in representative sectors.

**Outcome:** Available information for the Basin countries to allocate and access Climate Change Adaptation funds for specific implementation projects.

**Output III.1.3** Adaptation measures and public awareness

**Activities:** a) Formulate a set of adaptation measures to be incorporated into the SAP  
b) Communicate with public on issues and adaptation measures

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-the project target
Vulnerability Assessment	Adaptation measures for agriculture, water supply and intense rains	Low general public awareness on climate change impacts. Autonomous adaptation in the agriculture sector. Reactive adaptation to increased floods.	First report on measures and policies in representative cases to: - palliate incomplete adaptations in agriculture - overcome water supply problems - mitigate the effects of extreme rainfall events	Final report on measures to : - palliate incomplete adaptations in agriculture and irrigation - overcome water supply problems - mitigates extreme rainfall event effect and cities - firm energy generation urban development - wetland management, used for TDA and SAP preparation.
<b>a) Studies of adaptation to climate change</b>				
	Measures and policies to : - palliate incomplete adaptations in agriculture and irrigation - overcome water supply problems, - mitigates extreme rainfall event effect and cities - firm energy generation - urban development - wetland management and ecosystem protection All of this in pilot areas and cities	Low general public awareness on climate change impacts. Autonomous adaptation in the agriculture sector. Reactive adaptation to increased floods.	Analysis of alternative measures and actions in specific areas to : - palliate incomplete adaptations in agriculture and irrigation - overcome water supply problems, - mitigates extreme rainfall event effect and cities - firm energy generation - urban development - wetland management and ecosystem protection	Measures and policies developed and analysis and strategic action proposed to: - palliate incomplete adaptations in agriculture and irrigation - overcome water supply problems, - mitigates extreme rainfall event effect and cities - firm energy generation - urban development - wetland management and ecosystem protection, for specific areas and pilot activities, considered for the SAP
<b>b) Social communication and relations with users</b>				
	- Activities of the climate and hydrological scenarios disseminated. -Vulnerability impact and adaptation options publicly known. - Evaluation of the effort and investment in this field, thus diminishing uncertainty and the perception of unjustified risk.	Low general public awareness on climate change impacts. Autonomous adaptation in the agriculture sector. Reactive adaptation to increased floods.	Medium term report communicated in relation with the climate and hydrological scenarios and LPB vulnerability in specific areas as: -Vulnerability impact and adaptation. - Efforts and investments needed diminishing uncertainty and unjustified risk. Communication plan available for the TDA	Communication plan implemented that will allow transferring comprehensible results to all the society. - Communication tools available and reports posted on the Project Web page, IWRN node and IW-Learn

## 2.9 Budget:

## Co-financing

Sources of Co-financing	Type of Co-financing	Amount
Government Contribution	In-Kind	5.800.900
<i>CPTEC/INPE/MMA - Brazilian Research Center</i>	In-Kind	2,400,000
PROSUR IAI CRN-055 “Program for the study of regional climate variability, their prediction and impacts in the MERCOSUR area”	In-Kind	156
GEWEX / CLIVAR La Plata Basin experiment (LPB)	In-Kind	3,000,000
National Agency for Scientific and Technological Promotion – Argentina (07- 12246) Study on the ocean and atmospheric dynamics of the La Plata River estuary with an integral numeric modeling system.	In-Kind	100
National Agency for Scientific and Technological Promotion - Argentina (07- 12402) Climatic trends and scenarios in Argentina	In-Kind	120
National Agency for Scientific and Technological Promotion-Argentina (07- 14420) “Scientific and technological bases for the study and forecast of mesoscale precipitating systems over Argentina. Support for a flood alert system”)	In-Kind	140
LPB Project –CLIVAR- European Union /INCO EU project FP7-ENV-2007- 1 Proposal Nr. 212492 Clarís LBP	In-cash	4,217,734

## GEF Budget

Concept	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200 Consultants	\$8.000	\$132.500	\$122.500	\$32.500	\$24.500	\$320.000
2200 Sub contracts with institutions	\$80.000	\$140.000	\$145.000	\$145.000	\$0	\$510.000

Concept	Year 1	Year 2	Year 3	Year 4	Year 5	Total
3200 Workshops & Training	\$0	\$40.000	\$30.000	\$0	\$0	70.000
4100 Teams & Supplies	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total</b>	\$88.000	\$312.500	\$297.500	\$177.500	\$24.500	\$900.000

Consultants to be hired for the project

Consultant Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
Local Technical Assistance			
Consultant 1	750	134	1) Estimation of potential impacts on the firm energy of hydroelectric facilities. 2) Assessment of urban vulnerability to the most frequent intense rains. 3) Estimation of climate change impacts on agriculture. 4) Estimation of potential changes in floods.
Consultant 2	750	120	Analyze measures and policies to 1) palliate incomplete adaptations in agriculture 2) overcome water supply problems 3) mitigates extreme rainfall event effect All of this in pilot areas and cities.
Consultant 3	750	174	Dissemination activities of the climate and hydrological scenario, vulnerability impact and adaptation options. Emphasize effort and investment made in this field, thus diminishing uncertainty and the perception of unjustified risk.

See ToR in Annex 2.

Sub contracts with institutions to be hired for the project

Sub contracts	Tasks to be performed	Amount
Subcontract 1	A.1 Training and planning activities A.2 Climate scenarios for LPB according to different possible emission scenarios A.3 Development of hydrological scenarios	\$350.000
Subcontract 2	B.1 Hydrological alert needs – risk maps	\$160.000

## 2.10 Timetable:

Working Element	Activities	Timeline of Activities																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>III.1.1. Development and use of Regional Climate Scenario</b>																					
1 Training and planning activities																					
2 Climate scenarios for the LPB according to different possible emission scenarios																					
3 Development of hydrological scenarios																					
<b>III.1.2. Vulnerability assessment</b>																					
1 Hydrological alert needs – risk maps																					
2 Estimation of climate change impacts																					
<b>III.1.3 Adaptation measures and public awareness</b>																					
1 Studies of adaptation to climate change																					
2 Social communication and relations with users																					

**2.11 Cost effectiveness:** Climate change in relation with vulnerability assessment and adaptation measurement has been shown to restrict the availability of water for economic purposes, and to cause, *inter alia*, losses related to flooding and droughts and other extreme events. Taking a regional approach to the action plan for assessing climate and hydrological scenarios has been shown to be much a more effective approach when compared to similar actions undertaken at the individual or national basin level. Cost effectiveness is two-fold when dealing with hydro-climatic projection system at the basin level, optimizing both human and financial resources through (1) considering the transboundary dimensions of the issue to be addressed and (2) taking transboundary issues in such a manner as to yield global benefits.

The program increases the resilience to economic, social and environmental impacts of climate change within the regional scenarios. It creates a superior result through consensus among different scientific groups in the region. It increases the ability to mitigate impacts by having better projections of future scenarios. Additionally, the basin will benefit from improved warning systems. Cost effectiveness at the technical and economic levels can be maximized by developing focused pilot interventions in multi-national areas, which can be replicated at the basin level in conformity with regional guidelines and agreements. In this way, the pilot project for the present subcomponent, dealing with the Flood Forecasting System at Parana-Paraguay confluences, involves three of the LPB countries (Argentina, Brazil and Paraguay), exemplifying the benefits of a multi-national approach. Additionally, technical and economic benefits will be maximized due to the synergy achieved through joint action at the local and basin level. By combining regional technical capacities, climate change scenarios capable of identifying vulnerabilities and alternatives for environmentally sustainable economic and social development may be developed.

## 2.12 Risk Analysis

Risk	Rating (L/M/H)	Risk Mitigation Measures
The project do not integrate the existing projects in the region	M	The key institutions acting in this field are involved in the project
Geographic extent of the Basin, which is a limitation to effective and efficient participation and the active involvement	L	Strong linkages with professional bodies (scientifics) and relevant governmental bodies (decision makers) will minimize this risk

### 2.13

**Sustainability:** Project activities and implementation are designed (including the public involvement and stakeholder participation processes) to achieve sustainability. All of the activities form the foundation of a multi-sector, multi-institutional, and basin-wide arrangement for the implementation of the monitoring system. The project will be carried out by relevant scientific and government agencies involved with the theme, and will strengthen the existing institutional and human capacities. The networks will be integrated at an agreed upon regional level using a common framework, which maintains national responsibility for executing the action plan established for this stage.

**2.14 Replicability:** The results of the SAP formulation Phase will be disseminated through government institutions, nongovernmental institutions, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including the institutions related thereto in each of the five countries, will permit the development of information transfer mechanisms, to ensure dissemination of new knowledge, active coordination and horizontal cooperation among countries and organizations involved in the integrated management of the water resources of the Basin.

The integration of the Project information and communication system with other similar networks will constitute another important element in the dissemination and transfer of experience in order to replicate the institutional arrangements, sustainable practices, technologies and methodologies elsewhere in the Basin and Region. Through the IWRN Net Nodes, and the Internet-based Information and Communication Systems to be developed under Component I, the results and products of this Project will be transferred to and through IW-LEARN for wider dissemination within and outside of the region.

**2.15 Execution arrangement:** This component will be executed through contracts with consultants and subcontracts with specialized agencies. It will involve the responsible agencies of the five countries: National Meteorological Units (SMN, CPTEC/INPE/MMA, INEMET/MAPA, SENAMHI), Defense Ministries, and Organizations responsible for hydroclimatic forecasting (CIMA, UBA, INTA, INA, SIFEM, LART, FICH, ANA, EMBRAPA, Universidad Federal de Río Grande do Sul, IPH, INPE, SEDEC, USP, UFPR, Universidad de Asunción, Universidad de la República, IMFIA, SNE, DRENARE, DINAMA, ANNP), among others.

**2.16 Public participation mechanisms:** The participative dimension strengthens Basin governance and its interaction with the institutions that are the scientific leaders in the field. It also strengthens the interaction between academics and the users of scientific information in order to promote the development of vulnerability and adaptation analysis. Promoting public participation in this project is integral present throughout the process, ensuring adequate participation and involvement of the public and private sectors as a whole: state, government, academics and universities, NGOs, private companies and organized groups within civil society — with a special focus on gender equity and indigenous peoples. This involvement will also favor appropriations and the social sustainability of the action plan during both its formulation and implementation, including the

consolidation of social capacity, generation of a Basin consciousness, and appropriate and targeted informational and educational programming.

**2.17 M&E:** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

#### Process Outcomes and Indicators

Process OUTCOMES		Process INDICATORS	
Multi-country agreement on transboundary priority concern, impact and cause			<p>An Integrated Hydro-climatic projection System at the Basin level by means of:</p> <ul style="list-style-type: none"> <li>- Formulation of weather scenarios for the XXI century for the la Plata River Basin countries: number of countries that formulate climate scenarios, models and projected variables according to the results of the model inter-comparison program, model developments and/or adjustments; number of students and trained professionals at the end of the 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> years of the project implementation</li> <li>- Implementation of Communication Plans related to the social and economic vulnerability under various climate change scenarios</li> <li>- Studies of current adaptation practices and strategies.</li> </ul>
Multi-country agreement on governance reforms and investment to address priority transboundary concern			<ul style="list-style-type: none"> <li>- Technical counterpart to the CIC relating to hydroclimatic projection consolidated by the Advisory Committee for the execution of the present Subcomponent: 2 months after the beginning of the Project. –</li> <li>- Reports and meetings of meetings of the Technical Counterpart of the CIC concerning hydroclimatic projection</li> </ul>
Effective national Inter-ministry Coordination			<ul style="list-style-type: none"> <li>- Inter-ministerial mechanism at the national level established by the agreement for the execution of the Subcomponent on hydroclimatic projection prediction (national group).</li> <li>- Reports and minutes of meetings of the national groups.</li> </ul>
Stakeholder involvement			<ul style="list-style-type: none"> <li>- Increase awareness of and participation in climate change project activities through more workshops and meetings with local authorities, institutions, and stakeholders. More participants from indigenous communities.</li> <li>- Preparation and wide dissemination of project-related documentation and project-related activities through the fund for civil society</li> </ul>



Process OUTCOMES			Process INDICATORS
Multi-country waterbody legal framework adopted and/or strengthened			- Harmonization of legal instruments related to the theme, through the CIC.
Newly established and/or strengthened (existing) transboundary waters institutions			- More cooperation agreements signed between CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations. - Institutional strengthening (training and equipment) provided to institutions related to the climate change effects.

## ANNEXES

### Annex 1: Sub-basin location map



## Annex 2: Terms of Reference for Consultants

### Consultation 1

**Objective:**

Evaluation of impacts

**Activities:**

Develop 4 parallel studies dealing with :

- 1) Estimation of potential impacts on the firm energy of hydroelectric facilities.
- 2) Assessment of urban vulnerability to the most frequent intense rains.
- 3) Estimation of climate change impacts on agriculture.
- 4) Estimation of potential changes in floods.

**Results:**

These studies let know the impacts of climate change on the availability of hydroelectric power, the impact of urban areas in creating in the frequency and intensity of rainfall, affects of agriculture and runoff from watercourses.

**Duration:**

The duration for this task will be 12 months.

### Consultation 2

**Objective:**

Mitigation of Impacts. Pilot Projects

**Activities:**

Develop 3 parallel studies to:

- 1) palliate incomplete adaptations in agriculture
  - 2) overcome water supply problems
  - 3)mitigates extreme rainfall event effect
- Analyze measures and policies regarding these studies.  
All of this in pilot areas and cities.

**Results:**

Evaluation and an adaptation of the various mitigation measures employed

**Duration::**

The duration for this task will be 12 months.

### Consultation 3

**Objective:**

Information dissemination activities

**Activities:**

Dissemination of climate and hydrological scenarios and vulnerability impact and adaptation options.

Make use of the effort and investments made in this field, thus diminishing uncertainty and the perception of unjustified risk. Design informative materials.

**Results:**

Public knowledge of the themes related to climate change. Availability of informative materials.

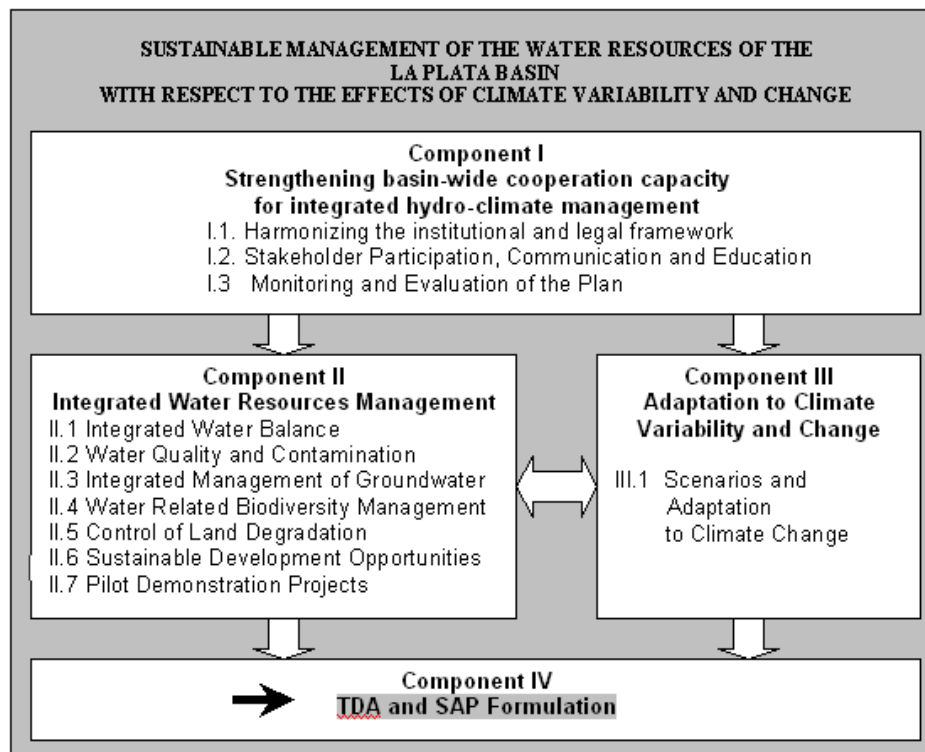
**Duration::**

The duration for this task will be 48 months.

**SUBCOMPONENT  
IV  
TRANSBOUNDARY DIAGNOSTIC ANALYSIS AND  
STRATEGIC ACTION PROGRAM FORMULATION**

**Part 1: Project Identifiers**

- 1.1 Sub-project title: Strategic Action Program Preparation  
 1.2 Link to umbrella project: Component IV: Transboundary Diagnostic Analysis and Strategic Action Program Formulation



- 1.3 Geographical scope: La Plata Basin  
 1.4 Executing Agency/entity: OAS, under OAS-CIC agreement, in cooperation with the following national institutions:
- Argentina: Ministerio de Planificación Federal, Inversión Pública y Servicios, Secretaría de Obras Públicas, Subsecretaría de Recursos Hídricos de la Nación.  
 Bolivia: Ministerio del Agua (MA), Dirección Nacional de Cuencas Hídricas.  
 Brazil: Ministério do Meio Ambiente. Secretaria de Recursos Hídricos e Ambiente Urbano (SRHU-MMA).  
 Paraguay: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos.  
 Uruguay: Ministerio de Transporte y Obras Públicas (MTO), Dirección Nacional de Hidrografía (DNH).
- 1.5 Duration: 5 years  
 1.6 Focal area(s): IW  
 1.7 GEF grant: \$ 1,292,824  
 1.8 Co-financing: \$ 3,638,500  
 1.9 Total funding: \$ 4,931,324  
 1.10 Associated financing: None

**1.11 Contact person:**

Name: Miguel Angel López Arzamendia  
 Title: CIC Secretary General and Project Director  
 Tel: (54-11) 431 22 506  
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**1.12 Project summary:**

A Strategic Action Program (SAP) for the la Plata Basin, which will be both technically sound and agreed upon by all involved stakeholders, will be prepared to advance and better define priority actions identified in the framework program, based upon a TDA focused on critical sub-basins and issues. This Component is comprised of two Working Elements: (i) TDA Preparation, including additional specific studies on priority issues not included in previous components, and (ii) SAP Preparation, based on the compilation and analysis of the technical and scientific elements of executed project activities.

**Summary Table of Subcomponent Work Elements, Outputs and Outcomes**

Work Elements	Output	Outcome
IV.1 TDA	Hydro-climatic assessment for TDA	The TDA, the basis for the SAP, identifies the priority hydro-climatic transboundary issues and root causes, and adaptive IWRM measures for the LPB
IV.2 SAP	SAP formulation	By the end of the project, the five riparian countries endorse the formulated SAP for the LPB, which includes an institutional framework and financing plan.

**Summary Table of Subcomponents Work Elements, Funding Sources, and Costs**

Work Element	Sources of funding				Total Cost (US\$)
	GEF Funding (US\$)		Co-financing (#) (US\$)		
IV.1 TDA	\$795,000		\$2,038,000		\$2,833,000
IV.2 SAP	\$497,824		\$1,630,500		\$2,128,324
<b>TOTAL</b>	<b>1,292,824</b>	<b>30%</b>	<b>\$3,668,500</b>	<b>70%</b>	<b>\$4,931,324</b>

(#) Government Counterpart and Co-financing (see details in 2.10)

**Part 2: Project design****2.1 Background and context:**

Background and introduction At the IV Inter-American Dialogue of Water Management (Foz de Iguazú, Brazil, 2001), initial conversations began concerning the preparation of a program for integrated water resources management in the La Plata Basin, within the context of climate change. Based on this initiative, the CIC-La Plata Basin, developed the *framework program for the Sustainable Management of La Plata Basin's Water Resources, in terms of the effects of variability and climate change*, recognized as the framework program, prepared with GEF financing and UNEP and OAS technical and administrative support,. The framework program's global objective is to assist the riparian governments of Argentina, Bolivia, Brazil, Paraguay and Uruguay in preparing an integrated water resources management plan, based on the principles for environmentally sustainable economic and social development, for the La Plata Basin, within the context of climate change and variability. This will be facilitated through institutional strengthening of the CIC.

*PDF Block B1 (2003-2005)*. During the period from November 2003 to December 2005, the PDF Block B of the framework program was implemented, ultimately yielding a baseline TDA. The TDA, which identified

priority issues that will be addressed in this GEF project (Stage 1 level of effort), has a duration of five years, and will serve as the building block for the preparation of the Strategic Strategic Action Program (SAP). The SAP, managed by the CIC, will be defined through a participatory consultative process in each country and within La Plata Basin. In sum, the PDF Block B achieved the following outputs: a) a defined La Plata Vision for the basin b) a baseline Transboundary Diagnostic Analysis (baseline TDA); and c) an agreed upon framework program, to be further developed through the SAP.

The *La Plata Basin Vision* is based on: i) the Millennium Development Goals agreed upon in 2000 and is within the scope of the United Nations Organization; and ii) the report on *Water for the XXI Century: Vision to Action - South America*, presented at the 2nd World Water Forum, held in Holland in the year 2000. During the framework program development, each country expressed their vision through national workshops and reports, which were later integrated in a comprehensive regional document, discussed, and agreed upon at an international event. From this, critical aspects of the water systems' condition and behavior were highlighted as were barriers to be overcome and issues to be mitigated.

In the following stage, the *baseline Transboundary Diagnostic Analysis (baseline TDA)* was prepared with the technical and social community, and identified the current and emerging critical transboundary issues in the La Plata Basin. The baseline TDA was developed through national workshops and regional engagement, elaborating on the preparatory process. In this first phase, both the main problems as well as the lack of information and strategic action proposals were defined, and predominant critical transboundary issues were identified. These issues are as follows:

1. **Extreme hydrological events**, particularly those connected with climate variability, such as The prolonged, recurring and intense floods as well as the long drought periods affecting the basin on a cyclical basis, with devastating social, economic and environmental effects. Recommendations were made to improve the capacity to prevent the effects of variability and climate change and strengthen technical capacity to model these phenomena so as to mitigate their causes, identify dangers and vulnerabilities as well as measures for adaptation to new climate and hydrological scenarios.
2. **Water quality degradation** from point and non-point sources, organic and chemical pollutants. Currently, there are no common standards or tools to determine quality parameters. There are limitations in the monitoring and control network of the five countries that limit the opportunities to make a coherent and comprehensive water quality diagnoses of the Basin's rivers.
3. **Sedimentation** in the basin's water bodies and courses, that limits the capacity of navigable ways and ports with significant maintenance costs, silts the dam reservoirs and modifies their water quality; processes caused by growing erosion and the land degradation that has increased due to changes in land use and loss of the vegetal cover.
4. **Alterations to biodiversity**, particularly of fluvial and coastal ecosystems, including wetlands, are problems mainly caused by habitat loss and fragmentation.
5. **Non-sustainable use of fishery resources**, due to over fishing or lack of captures protection methods. Fishing is an economic activity that provides basic food for important sectors of the countries' society, such as indigenous peoples and poor sectors of the population.
6. **Non-sustainable use of aquifers** in critical areas whose conservation makes it necessary for them to be managed in an integrated way with surface resources.
7. **Conflicts on water use and environmental impact of irrigated crops**, without a joint vision and a capacity to generate participatory processes of the involved players for their balanced solution.
8. **Lack of contingency plans before disasters**, including the issue of dam safety, problems related to accident and catastrophe prevention mainly associated with navigation and transport of hazardous and polluting material.
9. **Water insalubrities**, environmental health degradation and the associated effects on human health, resulting from pollution and water quality modifications.

Next, efforts to prepare a definitive Transboundary Diagnostic Analysis were initiated through various mediums, including consolidation of technical capacities, compilation of pilot project results and the execution of public participation workshops. Subsequently, the consolidated vision and baseline TDA information was further analyzed by experts from the five Basin countries during a series of thematic workshops, wherein the strategic actions to be included in the framework program were defined. These actions were later approved by the countries within the CIC.

During the **next Stage 1** (2008-2012), the framework program of Strategic Actions was defined as such: (i) Legal and Institutional Strengthening (ii) Capacity consolidation for Integrated and Sustainable Basin Management (iii) Execution of Demonstrative Pilot Projects with the objective of promoting local management experience and information for the preparation of the definitive TDA and SAP during Stage I, (iv) Preparation of a technically justified and socially agreed upon Strategic Action Program,, that furthers the program framework proposal, considering the adjustment and greater detail of specific studies and the necessary knowledge from the Transboundary Diagnostic Analysis-TDA., (v) Promotion of Public Participation, Communication and Education, as a transversal component intended to consolidate access to information and education within La Plata Basin and (vi) Program Monitoring and Assessment, which includes a follow-up plan that will be based on the indicators defined in the Logical Framework.

Statement of the Issue The La Plata Basin, which spans 3.1 million km<sup>2</sup>, is comprised of southern Brazil, south-eastern Bolivia, a great portion of Uruguay, all of Paraguay and an extensive area within central and northern Argentina. The three main water systems include the Paraguay River, with an annual minimum flow of 3.800 m<sup>3</sup>/s (at Pilcomayo Port), the Paraná River, with 17.100 m<sup>3</sup>/s (in Corrientes), and the Uruguay River, with 4.500 m<sup>3</sup>/s at its mouth.

The Paraná and the Uruguay converge in the La Plata River,, whose waters drain towards the South Atlantic Ocean and whose outflow, which feeds a rich ecosystem of marine species, is 25.000m<sup>3</sup>/s. At an outlet along the La Plata River an extensive corridor of wetlands links the Pantanal (at the head of the Paraguay River) with the Paraná Delta,, making up a water system with a remarkable biological diversity and productivity. Besides an abundance of surface water, the basin contains significant groundwater resources as well, with the underlying presence of diverse aquifers, such as the Guaraní Aquifer and the Yrenda-Toba-Tarijeño Aquifer Systems; the latter coinciding, to a great extent, with La Plata Basin's semiarid area: the South American Gran Chaco biome.

The richness of the Basin's mineral resources, the value of its forests and the fertility of its soils have turned La Plata Basin into one of South America's most economically prosperous and densely populated regions. With 57 cities of over 100.000 inhabitants (including the capitals of four of the five countries: Buenos Aires, Brasilia, Asunción, Montevideo- and Sucre, Bolivia's administrative capital), it collectively contains 70% of those countries' GDP. The economies of Argentina, Brazil and Uruguay, each with strong agricultural-livestock sectors, have also shown remarkable industrial and service production, whereas the Bolivian economy rests on its mineral resources and Paraguay's has developed based on agriculture and hydroelectric energy sectors.

This economic development requires multi-modal communication and transport means. In these circumstances, the hydrographic network is a fundamental element. At present, such extensive and navigable network is favored by regional agreements that promote its commercial use, such as Paraguay-Paraná Hydroway, among others. On the other hand, the Basin has an important hydroelectric potential, estimated in 92.000 MW, of which 60% has already been used or will soon be used.

During the last century quarter, changes in the frequency and duration of floods and droughts have occurred, which, in turn, has significantly impacted societies, national economies and the environment in general. . Moreover, the causes of quantitative changes in the availability of water resources, and the resulting variation in its quality, are mainly associated with the hydrological effect of variability and climate change. The respective connection with the change in land use, population growth, urbanization and industrial and agriculture and livestock development must also be taken into account.

2.2 Sub-component objective: A Strategic Action Program (SAP) for the La Plata Basin, which will be both technically sound and agreed upon by all involved stakeholders, will be prepared to advance and better define priority actions identified in the framework program, based upon a TDA focused on critical sub-basins and issues

2.3 Environmental benefits: The environmental benefits that will be accrued at the La Plata Basin regional level, can be summarized as follows:

- Increased knowledge on the natural resources of the Basin. The knowledge of water resources and ecosystems will allow for the introduction of basin-wide policies aimed at preserving the integrity of

surface and groundwater dependent ecosystems, in particular wetlands and humid zones, and the services they provide.

- Reduction in water related diseases, and mitigation of the impacts of climatic variability and change.
- Increases in freshwater resource bases, as integrated groundwater resources are assessed throughout the region.

At the global level, the TDA and SAP for the La Plata Basin, one of the largest river basins of the planet, will represent possibly one of the most significant demonstrations of IWRM to date, in which surface and groundwater will contribute to conjunctive uses and climate change mitigation strategies.

2.4 Overall sub Component Outcomes: Transboundary Diagnostic Analysis (TDA) completed and Strategic Action Programme (SAP) formulated and endorsed by the five riparian countries, within the framework of the CIC

2.5. Consistency of the sub-project with national/regional priorities and plans: The basin countries are developing individual national water resources plans as the basis for this project. On the other hand, the basin countries must uphold their commitments to relevant ratified United Nations Conventions.

2.6 Coordination and linkages to the umbrella project activities and other related activities in the basin:

Taking into account the main issues of common interest to the five countries, identified in the 1970's, the following GEF Projects have been initiated over the last decades at a transboundary level in La Plata Basin, besides the framework program:

- Strategic Action Program for the Bermejo River Basin (Argentina and Bolivia): Integrated management of transboundary basins that integrate the ecosystems from the Andes to the Chaco-pampeana plain, considering in particular the sediment problem.
- Integrated Hydrographic Basin Management Practices Implementation Project for the Pantanal and Upper Paraguay Basin (Brazil): Basin Conservation Plan, considering in particular biodiversity degradation and conservation processes in environments that include one of the region's most important wetlands.
- Environmental Protection of La Plata River and its Maritime Front: Pollution Control and Prevention and Habitat Restoration -FREPLATA (Argentina and Uruguay): Sustainable use of transboundary resources of La Plata River and its Maritime Front, considering in particular pollution and water quality-related problems.
- Environmental Protection and Sustainable Development of the Guaraní Aquifer System (Argentina, Brazil, Paraguay and Uruguay): Protection and Sustainable Use of the Guaraní Aquifer System, one of the most important in the region.
- Sustainable Land Use in the Transboundary Ecosystem of the South American Gran Chaco (Argentina, Bolivia and Paraguay): Project developed within the Subregional Action Program for the Sustainable Development of the South American Gran Chaco, at the Convention to Combat

The La Plata Basin program framework has been defined as an umbrella project for strategic actions to be carried out within the region. For this reason, this project will have direct interaction with other GEF projects in the watershed, as well as other initiatives, such as the basin plan of Pilcomayo River Basin, funded by the European Union.

2.7 Incremental reasoning:

Baseline PDF Block B of the framework program development was achieved considering the following stages:

- The definition of La Plata Basin Vision
- The preparation of a Transboundary Diagnostic baselineAnalysis (baselineTDA)
- The preparation and consensus of a Framework Strategic Action Program -framework program to be developed in Stage 1.

The structure of the framework program includes components with related strategic actions:

- Legal and Institutional Strengthening, which includes: consolidation of the coordination, planning and management capacity of CIC and of the technical and institutional capacities of the participating institutions, through framework program; the harmonization of the La Plata Basin's legal framework for the integrated water resources management, according to the sustainable development vision



that will be promoted in foreseeable scenarios of variability and climate change. This objective is reached through the three following strategic action groups: i) Strengthening of CIC and arrangements for framework program execution; ii) Strengthening of technical and institutional capacities in CIC Member States; and iii) Harmonization of the conceptual, legal and institutional framework.

- Capacity consolidation for the Integrated and Sustainable Basin Management, with emphasis on the integrated water resources management and adaptation to variability and climate change
- Execution of Demonstrative Pilot Projects with the objective of promoting local management experience and information for the preparation of the definitive TDA and SAP during Stage I. It includes: i) Pilot project for Pollution and Erosion Control in the Pilcomayo river Basin (Bolivia/Argentina/Paraguay); ii) Pilot project for a Hydro-environmental Alert System (Floods and Droughts in the Paraguay and Paraná rivers' confluence area (Argentina, Paraguay and Brazil); iii) Pilot Project for the Solution of water use-related conflicts (Cuareim/Quaraí rivers' Basin - Brazil and Uruguay); iv) Pilot Project for Biodiversity Conservation in a dam area of the Paraná river (Argentina, Brazil and Paraguay).
- Preparation of the Strategic Action Program, that will be both technically justified and socially agreed upon, to further the framework program proposal considering the adjustment and greater detail of the Transboundary Diagnostic Analysis-TDA. Specific studies complementing the necessary knowledge to prepare the TDA and SAP related to: i) limitations to navigation and its sustainable development in the Basin, including assessments as to how to overcome such challenges; ii) recognizing and analyzing the development of the remaining hydro-energetic potential and the possible use of alternative clean energy sources; iii) studying problems associated with the Basin's environmental clean-up, incidence on human health and transboundary effects and iv) dam safety, are included.
- Promotion of Public Participation, Communication and Education, as a transversal component intended to consolidate access to information and education within La Plata Basin in order to promote a greater and more conscious involvement and participation of civil society in the sustainable management of natural resources and development, considering in particular gender equity. The most remarkable tool will be the Fund for Public Participation Promotion, aimed at promoting involvement since its execution.
- Program Monitoring and Assessment, which includes a follow-up plan that will be based on the indicators defined in the Logical Framework.

Increment Strategic Action Program-SAP will be defined through a participatory process consolidated in each country and within La Plata Basin. The project contributes to a higher objective set forth by the five signatory countries to the La Plata Basin Treaty--Argentina, Bolivia, Brazil, Paraguay and Uruguay--as coordination of actions and investment in the La Plata Basin for the sustainable management of its natural resources. The increment will be: assembling, analyzing, and synthesizing the country-level information into and agreed regional level using a common framework.

Incremental reasoning The participation of the GEF in this Component implies the commitment of the five countries of the La Plata Basin to work together in coordinated tasks to achieve integrated water resources management. Taking a regional approach to the action plan at the basin level has been shown to be much more effective approach compared with undertaking these actions on an individual or national basin.

## 2.8. Working Element – Activities - Outputs – Outcome:

Sub-component Objective and Outcomes	Description of output indicator	Baseline level	Mid-term target	End-of-project target
A Strategic Action Program (SAP) for the La Plata Basin, which will be both technically sound and agreed upon by all involved stakeholders, will be prepared to advance and better define priority actions identified in the framework program, based upon a TDA focused on critical sub-basins and issues	Endorsed SAP Commitments to financing the SAP	Baseline TDA Framework Program	20%	100% endorsed SAP and 100%, all five riparians commit to financing the SAP
- The TDA, the basis for the SAP, identifies the priority hydro-climatic transboundary issues and root causes, identifies adaptive IWRM measures for the LPB	Hydroclimatic TDA	Baseline TDA (from PDF-B)	60%	100%
The five riparian endorses the formulated SAP for the LPB, inclusive of an institutional framework and financing plan, by the end of the project	SAP & Financing Plan	Framework program (from PDF-B)	20%	100%

### IV.1 TDA Preparation

**Objective:** Transboundary Diagnostic Analysis with a scientific and social basis, where the current and emerging critical transboundary issues in the La Plata Basin and their corresponding causal chains will be defined, based on the previous results of the baseline TDA and framework program. Supported by the special complementary studies, the TDA will encompass the results of the forecasting modeling and scenarios as well as the results of the climate change vulnerability assessment.

**Outcome:** The TDA, the basis for the SAP, identifies the priority hydro-climatic transboundary issues and root causes, as well as adaptive IWRM measures for the LPB

**Output IV. 1.1** Hydro-climatic assessment for TDA

Activities a) Prepare hydro-climatic assessment for TDA

b) Generate forecasts and adaptation scenarios

c) Identify vulnerabilities and risks

d) Compile and integrate supplemental studies that support the TDA

e) Riparian counterparts endorse TDA

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
Hydro-climatic assessment for TDA	TDA	Baseline TDA (from PDF-B)	60%	100%
a) Prepare hydro-climatic assessment for TDA				
Guidelines and actions that permanently strengthen and update the methodologies used in LPB for weather and climate prediction			Increased number of weather and climate forecast super-ensemble members with a resulting improvement in weather and climate forecast skills rates	
Development and application of distributed hydrological models and			Hydrological models distributed through sub-	

integrated hydrodynamic models	basin for rain volume transformation, taking into account the physical characteristics of the basin water systems. Integrated model for the entire basin including the hydrodynamic modelling of the main network. La Plata Basin hydrological scenarios (through sub-basin and integrated) in terms of climate scenarios
<b>b) Generate forecasts and adaptation scenarios</b>	
Construction of an operational precipitation estimation system for the basin	Hourly, daily and monthly precipitation charts over the entire LPB with their progressive quality improvement
Short term Prediction: Implementation and strengthening of Prediction centers.	Minimum covered needs of the physical facilities and the equipment and software in Hydrological Prediction Systems. Identification of qualified personnel needs
Short term prediction: To make the existing Early Warning System compatible and complementary.	Complementation and coordination of Hydrological Alert Systems that insure information exchange improvement. Definition of a minimum main network. Development of network proposals for the tributaries of the main rivers.
<b>c) Identify vulnerabilities and risks</b>	
Contingency Management	Contingency Plans prepared for transboundary risk management. Development of a technical cooperation network for sector to implement Contingency Plans
<b>d) Compile and integrate supplemental studies that support the TDA</b>	
Complementary studies fill in gaps in the knowledge base relating to critical issues identified in the framework program but not included in the previous Components. The results of such studies will support the preparation of a detailed TDA and SAP. These studies will address, <i>inter alia</i> : (i) navigation and sustainable development limitations in the Basin and their management; (ii) potential hydroelectric development projects and possible use of clean energy and technologies as alternative energy sources; (iii) transboundary environmental sanitation in the Basin and its impact on human health (e.g., the role of inadequate sanitation and stormwater management practices in stimulating and sustaining cyanobacterial blooms); and (iv) the contributions of dams to water security in the region	Complementary studies considering potential and possible problems associated with navigation, energy and power development, environmental health and water security in the La Plata Basin. These studies will be conducted in support of the TDA preparation
<b>e) Riparian counterparts endorse TDA</b>	
Preparation of the Transboundary Diagnostic Analysis with a scientific and social basis, wherein the current and emerging critical transboundary issues in La Plata Basin and their corresponding causal chains will be defined, base on the pervious results of the Macro TDA and framework program. The elaboration process will be through national workshops of regional integration. The main problems as well as the lack of information has to be defined.	Agreed upon document, containing strategies for the sustainable utilization of the Basin's land and water resources, considering the vulnerability to climate variability and change. This document will include a financing plan for the implementation of the proposed actions, with identification of partners, donors and investors.

## IV.2 SAP Preparation

*Objective:* A Strategic Action Program (SAP) for the la Plata Basin, that is both technically sound and agreed upon by all involved stakeholders, will be prepared to advance and better define priority actions identified in the framework program, based upon a TDA focused on critical sub-basins and issues

**Outcome:** The five riparian countries endorse the formulated SAP for the LPB, inclusive of an institutional framework and financing plan, by the end of the project

**Output IV.1.2 SAP formulation**

**Activities:** a) Collaborate with stakeholders, incorporate TDA-identified issues, and findings from priority activities and

pilot-demonstrations into the SAP

b) Riparian counterparts endorse SAP and pledge financing

The SAP is the synthesis of the conclusions and experiences of Components I, II and III, including the particular experiences gained in the pilot projects, priority demonstration projects, and other GEF-IW projects under execution in the Basin, which will provide more accurate information on the local management of and solutions to the main problems facing the Basin. It is supported by public participation workshops, meetings of the Thematic Groups, the National Project Units, Inter-ministerial meetings, and other consultations and studies. The Component will also look at the formulation of a financial strategy for securing funding for SAP implementation considering *inter alia* the use of financial instruments, including mechanisms such as revolving loan funds, water pricing, and public-private partnerships, and application of value to ecosystem services. Non-structural interventions to be evaluated could include, *inter alia*: consideration of alternative, sustainable livelihoods and/or production methodologies (such as use of aquaculture to protect and preserve stocks of native fishes with high economic value, for example); and implementation of clean technologies and alternative energy sources.

Outputs and Activities	Description of indicator	Baseline level	Mid-term target	End-of-project target
IV.1.2 SAP formulation	Endorsed SAP Commitments to financing the SAP	Baseline TDA Framework Program	20%	100% endorsed SAP and 100%, all five riparians commit to financing the SAP
a) Collaborate with stakeholders, incorporate TDA-identified issues, and findings from priority activities and pilot-demonstrations into the SAP				
The SAP is elaborated, including a chapter on climate adaptation. A menu of adaptation measures will be formulated through a comprehensive multi-stakeholder participation process; negotiated and endorsed at the country level through the national inter-ministerial committees; and endorsed and promoted at the regional level through the CIC. It will also be supported by the various meetings of the Thematic Groups, and the National Project Units. Although the SAP formulation is an iterative process and formulation of outlines for the TDA and SAP will be from the onset of the project, this Component will be executed during the final 4 years of the Project period.			Agreed upon document, containing strategies for the sustainable utilization of the Basin's land and water resources, considering the vulnerability to climate variability and change. The document will include a financing plan for the implementation of the proposed actions, with identification of partners, donors and investors.	
b) Riparian counterparts endorse SAP and pledge financing				
The SAP is formulated with a financing plan for investments. The riparian countries through the CIC endorse the SAP and financing plan			Endorsed SAP and Financing Plan	

## 2.9 Budget:

### Co-financing

Sources of Co-financing	Type of Co-financing	Amount
Government Contribution	In-kind	\$2,038,000
Waterway's Intergovernmental Committee (CIH)	In-kind/in-cash	\$1,000,000
PILCOMAYO – European Union	In-kind/in-cash	\$600,500

Sources of Co-financing	Type of Co-financing	Amount
Cooperation		

## GEF Budget

Concept	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1200 Consultants	0	85,000	15,000	70,000	30,000	200,000
2200 Sub contracts with institutions	156,480	181,830	181,830	181,830	42,854	744,824
3200 Workshops and Training	60,000	70,000	70,000	70,000	30,000	300,000
4100 Equipment and Supplies	20,000	0	0	0	20,000	40,000
5100 Misc: IW Conference Participation	0	4,000	0	4,000	0	8,000
<i>Total</i>	236,480	340,830	266,830	325,830	122,854	1,292,824

## Consultants to be hired for the project

Consultants Position Titles	\$/ person week	Estimated person weeks	Tasks to be performed
Local Technical Assistance			
Consultant 1	750	67	Contingency Plans prepared for transboundary risk management. Setting up of a technical cooperation network of the sector to implement Contingency Plans
Consultant 2	750	107	(i) navigation and sustainable development limitations in the Basin and their management; (ii) potential hydroelectric development projects and possible use of clean energy and technologies as alternative energy sources; (iii) transboundary environmental sanitation in the Basin and its impact on human health (e.g., the role of inadequate sanitation and stormwater management practices in stimulating and sustaining cyanobacterial blooms); and (iv) the contributions of dams to water security in the region
Consultant 3	750	34	Diagnostic (TDA) identifying the critical transboundary themes and their defined causal links as a base for the design of the SAP.
Consultant 4	750	34	Definition of strategic guidelines for the sustainable utilization of the Basin's land and water resources, considering the vulnerability to climate variability and change.
Consultant 5	750	27	Financing plan for the implementation of the proposed actions, with identification of partners, donors and investors

## Sub contracts with institutions to be hired for the project

Sub contracts	Tasks to be performed	Amount
Subcontract 1	Knowledge Development Activity 1.1 Forecasts and Scenarios Activity 1.2	\$415.000,00

## 2.10 Timetable:

Working Elements	Activities	Activity Schedule																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>IV.1 TDA Preparation</b>																					
<b>1. Hydro-climatic Assessment for TDA preparation</b>																					
1.1 Knowledge Development																					

Working Elements	Activities	Activity Schedule																			
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.2 Forecasts and Scenarios																					
1.3 Vulnerability																					
<b>2. Complementary studies conducted in support of the TDA preparation</b>																					
<b>3. Consolidación del TDA</b>																					
<b>IV.2 SAP Preparation</b>																					

**2.11 Cost effectiveness:** Taking a regional approach to the action plan for assessing strategic lines at the basin level has been shown to be a much more effective approach in comparison to undertakings directed toward individual or national basins. Cost effectiveness is two-fold, optimizing both human and financial resources through (1) considering the transboundary dimensions of the issue to be addressed and (2) addressing transboundary issues in such a manner as to yield global benefits. Cost effectiveness at the technical and economic levels can be maximized by developing focused pilot interventions in multi-national areas, which can be replicated at the basin level in conformity with regional guidelines and agreements. In this way, all the pilot and priority project experiences will be integrated with the TDA and SAP formulation.

#### 2.12 Risk Analysis

Risk	Rating (L/M/H)	Risk Mitigation Measures
Inadequate identification of the key stakeholders for the design of the TDA and SAP.	L	Appropriate process of participation.
Stakeholders show low willingness to participate in the design of the SAP.	L	Appropriation participative process with the key actors in the various levels identified.
Geographic extent of the Basin, which is a limitation to effective and efficient participation and the active involvement	L	Strong linkages with civil society, professional bodies, and relevant governmental bodies will minimize this risk

**2.12 Sustainability:** Project activities and implementation are designed (including the public involvement and stakeholder participation process) to achieve sustainability. All of the activities form the foundation of a multi-sector, multi-institutional, and basin-wide arrangement for the implementation of the monitoring system. The project will be carried out by relevant government agencies, and will strengthen the existing institutional and human capacities. The networks will be integrated at an agreed upon regional level using a common framework, which maintains national responsibility for executing the action plan established for this stage. The SAP will include a financing plan for the implementation of the proposed actions, with identification of partners, donors and investors to support future sustainability.

**2.13 Replicability:** The results of the Project will be disseminated through governmental institutions, nongovernmental organizations, universities and other stakeholder entities participating in the activities. The strengthening of the CIC, including the institutions related thereto in each of the five countries, will permit the development of information transfer mechanisms to share new knowledge and provide for active coordination and horizontal cooperation in the integrated management of the Basin's water resources. The pilot project deals with a common upstream basin problem and the insight obtained will be easily adopted at the regional level throughout the dissemination process. Since all of the proposed activities are multifaceted in nature and include a strong multi-stakeholder participation element, which will contribute to the "buy-in" of the project constituencies, the prospect for

replicating such activities are high and can be achieved with minimal efforts exchanging relevant information and experience learned.

2.14 Execution arrangement: The execution will be performed by National Executing Organisations with the support of the International Technical Coordinator at the SG/CIC, and in cooperation with the National Project Units.

2.15 Public participation mechanisms: In sub-component I.2 “Stakeholder Participation, Communication and Education” the activity “Incorporating Good Practices and Lessons Learned in the Preparation of the TDA and the SAP” has been included and is directly linked to the present development of Component IV “Strategic Action Program Preparation”.

The general objective of this Activity is to create a Transboundary Diagnostic Analysis (TDA) that considers, integrates and defines with a scientific analysis, the main environmental problems acknowledged by society, and identifies and prepares a Strategic Action Program (SAP) based on the proposals for strategic actions generated by the active participation of civil society. Specific objectives include:

- Civil society organizations and academic institutions of the Basin participating actively in planning and management.
- Transparent decisions regarding projects taken in consultation with competent public institutions in each country and in dialogue with the participating civil society organizations.
- Women and men participating actively according to their needs, capacities and wills, and encouraged by their active involvement in the execution of actions in the management of the Basin.
- Technical personnel of the competent sectoral institutions, members of civil society organizations, and organizations and water users participating in the preparation of the TDA and SAP.
- Ministerial authorities defining and validating proposals in their respective fields of responsibility, acting on participatory proposals.

The activity includes incorporating lessons learned from civil society organizations and the experiences of projects financed by the GEF in the elaboration of the TDA; including academic capacities that provide the scientific and technical base of perceived problems and permit prioritization by the public and private organizations essential for the social sustainability of the proposed planning process. Participation will be facilitated by the definition of prospective settings, national workshops and seminars dealing with the issues of the Basin. The TDA process will include interviews with key actors and meetings of the inter-ministerial working groups (IWGs) of the project in the countries. The work of these IWGs will be supported by the analyses and assessments to be completed as part of the Project. Virtual fora and videoconferences will be organized, dealing with issues related to the TDA and SAP, particularly among the National Coordinators and Technical Coordinators, facilitated by specialized consultants working on specific themes.

Additionally, in sub-component I.2 “Stakeholder Participation, Communication and Education” the activity “Public Participation Fund (PPF) for the Integrated Management of the Basin” has been included. The objective of this Fund is to involve private organizations and civil society organizations in specific activities, ranging from research, to dissemination and management of critical issues in the La Plata Basin, for which such organizations would have a comparative advantage and/or strong proven capacity. The Fund should consider gender equity criteria as well as disadvantaged groups. The Fund will function according to defined operational procedures captured in a Manual presented for consideration and approval of the Steering Group at its first meeting. It will finance actions closely linked to the framework program considering, *inter alia*, research projects, information dissemination and social integration as well as strategies for adaptation to climate change and variability, management of wetland corridors, etc.

The co-financing level, the technical quality of the proposals, and their relevance the formulation of the SAP will be determining factors for selection. The Fund will be open to donors and calls for proposals could continue to be announced based on the evaluation of the success achieved in the first calls.

The organizations selected for financing will form an Advisory Board for the Project that will monitor the Fund and make recommendations to the SC. The output of the activity will be the Fund for Public Participation established with approved Regulations, and the financing of up to 20 projects proposed by civil society organizations and/or academic institutions working on critical issues in the La Plata Basin, together with

related project reports and documented local impacts. The success of the Fund will be monitored and evaluated initially by the Fund's Proposal Selection Committee and, subsequently, during the monitoring and evaluation process at the mid-term and end of the Project. Accordingly, the Fund will achieve participation of academic and civil society organizations in the areas of communication, education and sustainable management of natural resources, by developing concrete projects for the TDA.

**2.16 M&E:** The Project will meet the standard monitoring and evaluation (M&E) procedures of UNEP (administrative, technical and financial), and include quarterly advance reports, quarterly and annual expense reports, monitoring of co-financing, and mid-term and final evaluations. A detailed Monitoring and Evaluation Plan (Component I), based upon the Logical Framework, will be further elaborated jointly by the national executing agencies and the CIC in close consultation with UNEP-OAS, and will be approved by the Steering Committee. The M&E system will use quantitative indicators as a tool for monitoring and ensuring feedback to decision makers to enable any necessary project modification in a timely manner (adaptive management).

#### PROCESS OUTCOMES AND INDICATORS

Process OUTCOMES		Process INDICATORS	
Project			Project
Multi-country agreement on transboundary priority concerns, impact and cause			<ul style="list-style-type: none"> <li>- TDA and SAP completed and endorsed by the five countries by the end of the project.</li> <li>- Pilot projects completed and documented; ready to be up-scaled by the end of the project</li> <li>- Institutional framework for the SAP implementation in place by the end of the project</li> <li>- SAP financing plan completed by the end of the project</li> </ul>
Multi-country agreement on governance reforms and investment to address priority transboundary concern			<ul style="list-style-type: none"> <li>- Constitution of the Technical Unit at the CIC relating to TDA and SAP preparation as and advisory committee for the execution of the Component 2 months after the beginning of the Project .</li> <li>- Reports and minutes of meetings of the Technical Unit of the CIC concerning water quality.</li> </ul>
Effective national Inter-ministry Coordination			<ul style="list-style-type: none"> <li>- Inter-ministerial mechanism established at the national level to agree to the execution of the TDA and SAP preparation (national group).</li> <li>- Inter-ministerial agreement of the agencies involved in each country to define the representation of the Technical Group of the CIC concerning TDA and SAP preparation.</li> <li>- Reports and minutes of meetings of the national groups.</li> </ul>
Stakeholder involvement			<ul style="list-style-type: none"> <li>- Increase awareness of and participation in the TDA and SAP preparation through more than 5 workshops and meetings with local authorities, institutions, and stakeholders.</li> <li>- Preparation and wide dissemination of project-related documentation and project-related activities through the fund for civil society (PPF.)</li> </ul>
Legal framework for transboundary waters adopted and/or strengthened			<ul style="list-style-type: none"> <li>- Legal framework in agreement with the CIC</li> </ul>
Newly established and/or strengthened (existing) transboundary waters institutions			<ul style="list-style-type: none"> <li>- Signed cooperation agreements between the CIC and government institutions, international agencies, Public and Private Universities, academic institutions, and civil society organizations.</li> <li>- Institutional strengthening provided to institutions related to the TDA and SAP preparation.</li> </ul>



## ANNEXES

## Annex 1: Terms of Reference for Consultants

**Consultant 1****Objective:**

Contingency Management

**Activities:**

Identification and evaluation of transboundary risks.

**Results:**

Contingency Plans prepared for transboundary risk management. Setting up of a technical cooperation network of the sector to implement Contingency Plans

**Duration::**

The duration for this task will be 12 months.

**Consultant 2****Objective:**

Complementary studies to existing information.

**Activities:**

Complementary studies fill in gaps in the knowledge base relating to critical issues identified in the framework program but not included in the previous Components. The results of such studies will support the preparation of a detailed TDA and SAP. These studies will address, *inter alia*: (i) navigation and sustainable development limitations in the Basin and their management; (ii) potential hydroelectric development projects and possible use of clean energy and technologies as alternative energy sources; (iii) transboundary environmental sanitation in the Basin and its impact on human health (e.g., the role of inadequate sanitation and stormwater management practices in stimulating and sustaining cyanobacterial blooms); and (iv) the contributions of dams to water security in the region

**Results:**

Complementary studies considering potentials and possible problems associated with navigation, energy and power development, environmental health and water security in the La Plata Basin. This studies will be conducted in support of the TDA preparation

**Duration**

The duration for this task will be 12 months.

**Consultant 3****Objective:**

Diagnostic (TDA) identifying the critical transboundary themes and their defined causal links as a base for the design of the SAP.

**Activities:**

Development of a Transboundary Diagnostic Analysis with a scientific and social basis, where the current and emerging critical transboundary issues in La Plata Basin and their corresponding causal chains will be defined, base on the previous results of the Macro TDA and framework program. The elaboration process will be through national workshops of regional integration. The main problems as well as the lack of information will be defined.

**Results:**

Availability of the TDA

**Duration**

The duration for this task will be 36 months.

**Consultant 4****Objective:**

Definition of strategic guidelines for the sustainable utilization of the Basin's land and water resources,

considering the vulnerability to climate variability and change.

**Activities:** The consultant, using all information available, will develop a SAP including a climate adaptation component or menu of adaptation measures. This will be formulated through a comprehensive multi-stakeholder participation process; negotiated and endorsed at the country level through the national inter-ministerial committees; and endorsed and promoted at the regional level through the CIC. It will also be supported by the various meetings of the Thematic Groups, and the National Project Units. Although, the SAP formulation is an iterative process and formulation of outlines for the TDA and SAP date back to the onset of the project, this Component will be executed during the final 4 years of the Project period.

**Results:**

SAP available.

**Duration::**

The duration for this task will be 36 months.