PROJECT DOCUMENT

1. IDENTIFICATION

Project Name:	Sustainable Management of the Water Resources of the La Plata Basin with respect to the Effects of Climate Variability and Change
Duration:	5 years
Implementing Agency:	UNEP
Local Executing Agency:	Intergovernmental Coordinating Committee (CIC) for the La Plata Basin 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, Dirección de Cuencas hídricas. *Brazil*: Ministério do Meio Ambiente, Secretaría de Recursos Hídricos e Ambiente Urbano. *Paraguay*: Secretaría del Ambiente (SEAM). Dirección General de Protección y Conservación de Recursos Hídricos. *Uruguay*: Ministerio de Transporte y Obras Públicas (MTOP), Dirección Nacional de Hidrografía (DNH).
Regional Executing Agency:	OAS
Requesting Countries:	Argentina, Bolivia, Brazil, Paraguay and Uruguay
Eligibility:	Under paragraph 9(b) of the Instrument
GEF Focal Area:	International waters and Climate Change Adaptation with relevance to crosscutting issues of Land Degradation and Biodiversity.

2. SUMMARY

LPB summary. The LPB, which covers approximately 3.1 million km^2, is one of the world's largest river basins. It includes almost all of the southern territory of Brazil, the south-eastern territory of Bolivia, a large part of the territory of Uruguay, all of Paraguay, and an extensive portion of the central and northern territory of Argentina. The basin's rivers drain approximately one-fifth of the South American continent. Water and nutrients from the central regions of South America drain into the La Plata River to the southwest and discharge into the Atlantic Large Marine Ecosystem (LME). The basin is comprised of three large river systems[1] the Paraná River, the Paraguay River, and the Uruguay River. Areas of the basin with relatively scarce rainfall and high evaporation levels define the arid and semiarid zones to the west (Gran Chaco Americano region), while strong rainfalls and runoff (runoff due in part to deforestation) characterize the north-eastern regions of the basin. The LPB has important groundwater resources, predominately the Guaraní Aquifer System, with a subsurface extent of 1,190,000 km^2, one of the largest continental groundwater reservoirs in the world; and the Yrenda-Toba-Tarijeño (SAYTT) Aquifer System, is another potentially important groundwater resource. At the headwaters of the Paraguay River, the natural ecosystem function of the Pantanal wetland stores is to store runoff from rainfall in the Alto Paraguay River catchment; the storage delays the maximum flows to the Parana River for almost six months, thereby minimizing downstream flooding. An extensive north-south wetland corridor links the Pantanal wetland with the Delta del Parana, of the La Plata River. This expanse constitutes a riverine ecosystem with great biological diversity and productivity. In a review by the World Resources Institute, the La Plata River ecosystem was identified as one of the most important river basins in the world, with the Paraguay River sub-basin having a significant number, variety, and degree of endemic fish species, and the Parana River sub-basin with highest numbers of native birds.

The basin's extensive mineral resources, forests, and soil fertility are conducive to economic development, contributing to 70 percent of the GDP of the five countries. The basin's present population exceeds 100 million, with 57 cities having more than 100,000 inhabitants, and includes the riparian's five capital cities: Buenos Aires, Sucre, Brasilia, Asunción, and Montevideo. The Argentine, Brazilian, and Uruguayan economies have a strong agriculture sector that is predominately based on cattle, with significant levels of industrial and service production associated with this sector, while Bolivia and Paraguay maintain agrarian-based economies. Economic development demands infrastructure networks in energy, communication, multi-modal transportation, of which the basin's hydrologic system is a fundamental element, connecting production, supply, consumption, import/export centers. The city of San Paulo, one of the largest cities with one of the largest industrial concentrations in the world, is located at the basin's headwaters, on a tributary to the Parana River. The extensive navigation system on the LPB operates in accordance to a number of regional commercial agreements.[2] In terms of energy infrastructure, the basin's hydropower potential is estimated at 92 GW; approximately 60 percent of this potential is already operational using more than 150

[1] The Paraguay River has an average annual flow of 3,800 m^3/s (at Pilcomayo Harbor), the Parana River has an average annual flow of 17,100 m^3/s (at Corrientes), and the Uruguay River has an average annual flow of 4,500 m^3/s. These last two rivers come together to form the La Plata River, draining into the Atlantic Ocean, with an average output of 25,000 m^3/.s

[2] Along the Paraguay-Paraná waterway, fluvial transport of goods increased from 700 thousand tons at the beginning of 1990 to 13 million tons in 2004, with a goal to reach 50 million tons.

dams,[3] 72 of which exceed 10 MV.

LPB issues. The LPB is in a complex climatic region with significant gaps in the available data, which generates uncertainties for the modelling of spatial, temporal parameters that are needed for adaptive transboundary water resources management. The climate is a determining factor in the basin's heterogeneous hydrological system. According to a series of climate change scenarios developed during the project preparation process, climatic variability associated with El Nino/La Nina periodicities have a dominant influence on the basin's hydrology. During the last 40 years, the LPB has indeed witnessed significant changes in rainfall and discharge patterns. Precipitation in the basin has increased by 10 to 15 percent on average with some places experiencing a 30 percent increase. Consequently, during this same period, the basin experienced unprecedented peaks in river discharge, especially during the El Nino period of the ENSO events that significantly affected basin economies. During the last three ENSO-related events the number of people affected, in the Argentine portion of the drainage area, was estimated at 150,000 during each event, and economic losses were estimated at US$ 17.5m affecting an area of 18.5m hectares. It is important to note, that despite the significant land use changes that coincided with this 40-year period, the increased precipitation and increased discharge throughout the basin has nevertheless been attributed mainly to the climatic and hydrological characteristics of the basin. The basin's generally low gradient limits the conveyance capacity of the basin's increased runoff, subsequently contributing to higher evaporation rates, from longer, or at times permanent, flooding periods in the lower reaches of the basin. This flooding is exasperated by land uses changes. These intrinsic characteristics of the LPB, together with negligible changes in precipitation have significant implications on discharge, making water-related activities highly vulnerable to climate change. The basin issues are complex and demand an integrated approach to address them. Through the project preparation process, during which a baseline transboundary diagnostic analysis was completed, priority basin issues were identified and they include:

a) high sediment transport rates[4] and associated soil erosion contribute to navigation problems, deterioration of water quality, and pose problems for the basin's energy infrastructure;
b) land and soil degradation, biodiversity loss in the Grán Chaco Americano, within the LPB, a vast plain that extends through northern Argentina, south-eastern Bolivia, north-western Paraguay and into a small area of south-western Brazil;
c) ecosystem deterioration of the Pantanal wetland, the world's largest and globally important wetland is being fragmented due to a multitude of anthropogenic impacts;
d) marine and fluvial biodiversity degradation, especially at the maritime front of the La Plata River and the southwest Atlantic LME;
e) unsustainable groundwater exploitation of the Guarani Aquifer System;
f) more frequent, intense and longer lasting floods of the Parana River contribute to significant economic, social and environmental impacts; and
g) uncontrolled urbanization and land-use changes contribute to microclimate changes.

[3] In terms of hydropower, three dams are bi-national: Itaipú (12.6 GW) and Yacyretá (3.1 GW) located on the Paraná River and Salto Grande (1.89 GW) on the Uruguay River.
[4] Approximately 100 million tons/year in the Parana River (at Corrientes) originates largely in the Bermejo River Basin.

Institutional history of water resource management. In 1967, during the First Meeting of the Ministers for Foreign Affairs of the LPB, the riparian governments - Argentina, Bolivia, Brazil, Paraguay, and Uruguay - established the Intergovernmental Coordinating Commission (CIC) as the basin-wide coordinating body. Two years later the riparians signed the LPB Treaty, the primary legal instrument for the LPB. The CIC, created as the permanent basin organization, is *"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 this treaty, a series of complementary agreements established different specialized bodies with specific competencies in the LPB. The FONPLATA is the financing agency, the Inter-governmental Committee for the Paraguay-Parana Waterway (CIH) is the inter-modal transportation agency, and the CIC Commission has technical and political representation. There is also the CIC-Unit for Projects and the Office of the Secretary General. The treaty also allows independent bi-national or tri-national agreements to focus on specific bi-lateral issues, creating additional organizations and programs. An institutional framework for regional integration reaffirmed by the Asuncion Treaty created the MERCOSUR in 1995 as an incentive for intraregional and international trade for the five countries.

The preparation of an integrated water resources management program in relation to climate change was agreed upon in 2001 during the IV Inter-American Water Management Dialogue. At that meeting, the president of the CIC, Foreign Affairs representatives of the LPB countries, experts, technicians, and project personnel from the five countries, with GEF support, agreed on the need to develop a baseline framework for the LPB in order to: "i) coordinate common interest projects for the La Plata Basin countries; ii) carry out projects in water resources management and select concrete prioritized actions; iii) highlight the importance of flood and drought phenomena in the Basin, among others; iv) define sustainable hydrology; and v) promote regional initiatives identified as priorities by two or more countries within the framework of the La Plata Treaty" To this end, the necessary technical management capacity in the La Plata Basin was approved by the meeting of Foreign Affairs Ministers in Montevideo during December 2001, with the appointment of two representatives from each country — a political representative with full authority and a technical representative, the latter forming the Projects Unit of the La Plata Basin system and charged with the preparation of an **Action Plan** for the LPB. This Action Plan, approved by the CIC during 2003, has guided the preparation of the **Framework Strategic Action Program** (framework program), itself based upon the common vision of the five countries, and defining strategies to guide development in the LPB during the short (5 years), medium (10 years) and long term (more than 15 years). Within this context, the CIC requested GEF PDF Block A support to identify the priority transboundary program elements and GEF PDF Block B support to prepare the Framework Program. The five countries catalyzed their own funds and agreed on cooperation efforts with the WMO and FONPLATA to assist in undertaking these efforts.

Project objective, outcome, outputs, and components. The overall project **objective** is to strengthen transboundary cooperation among the riparian country governments of

Argentina, Bolivia, Brazil, Paraguay, and Uruguay[5] to ensure management of shared water resources of the 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 water resources within the context of climate variability and change. This basin-wide project builds on existing projects and programs coordinated and executed by the Intergovernmental Coordinating Committee for the LPB countries (CIC), and by bi-national and tri-national committees created under the La Plata Basin Treaty (LPB Treaty); and provides context for, and linkages between, ongoing GEF-supported efforts within the LPB. This GEF project promotes synergies between GEF focal areas to increase the resilience and adaptive capacity of the LPB stakeholders in preparing a basin-wide structured menu of concerted adaptation measures that were identified in the vulnerability and adaptation assessments, and then promulgated and endorsed in the Strategic Action Program (SAP). The **principal outputs** include institutional coordination and transboundary cooperation agreements for formalized projects, established information resources and data network for adaptive-IWRM, hyroclimatic TDA, and an IWRM. SAP identified activities reflect integrated planned actions, implementation schedules, with satisfactory monitoring and evaluation (M&E) compliance. To achieve the project objective, accordingly, the project has three **Components**: (i) strengthening basin-wide cooperation capacity for integrated hydro-climate management; (ii) implementing priority activities and pilot demonstrations for lessons on integrated water resources management; (iii) developing hydro-climatic models and scenario for adaptation planning; and (iv) completing a hydro-climatic TDA and formulating a Strategic Action Program (SAP). The project document summaries the component activities and further details project specific activities, M&E and budget details are included in the detailed subcomponent descriptions.

Costs and Financing Summary (see detail budget in section 7)

GEF:	- SAP formulation project	**US $ 10,730,000**
	- PDF A:	(US $ 25,000)
	- PDF B:	(US $ 700,000)
Co-financing for FP		**US $ 51,034,087**
Total Project Cost:		**US $ 61,764,087**
Associated Financing[6]		**US $ 126,100,000**

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[5] The riparian governments operate within the framework of the Intergovernmental Coordinating Committee for the LPB countries (CIC), as the agreed intergovernmental organization set forth for this purpose in the La Plata Basin Treaty.
[6] The Associated Costs are the total for the baseline conditions in the La Plata Basin and estimated at US$ 126,060,00 (126.1 million)

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TABLE OF CONTENTS

ANNEXES

Subproject Documents

1. Program background and context

1.1. GEF program context

A baseline framework for the Integrated Management of the Water Resources of the La Plata Basin was prepared, utilizing PDF Block B funds allocated under the auspices of GEF International Waters Strategic Focal Area. This framework identified priority interventions focused on the application of appropriate land distribution and water resources strategies and policies, and reformulated sectoral activities, consistent with the principles of sustainable development. Considering the large area extent of the La Plata Basin (LPB), the main problems facing basin managers is that basin's water resources intimately interdependent with the causes and effects of climate variability and change. This interrelationship also influences concerns relating to sustainable land management and biodiversity.

The five countries which form the La Plata Basin, Argentina, Bolivia, Brazil, Paraguay and Uruguay, have ratified the following United Nations Conventions linked to the present program: (i) the Framework Convention on Climate Change and its main instrument, the Kyoto Protocol; (ii) the Convention on Biodiversity; (iii) the Convention on Combating Desertification; and (iv) the Ramsar Convention on wetlands protection. The five countries have presented their respective, first national communications and inventories as agreed under the United Nations Framework Convention on Climate Change (UNFCCC). These reports address vulnerability to climate change, define future climate scenarios, and propose the adoption of necessary adaptation measures. In addition, the five basin countries have published their initial National Communications (NCs) in response to the UNFCCC requirements; Paraguay, Argentina, and Brazil 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, these SNCs recommend capacity building and institutional strengthening measures necessary to integrate climate change concerns into regional planning scenarios, which activities form the nexus with this project.

Historically, for the LPB, agreements for policies, programs and plans included development principles and implementation measures, the tools necessary to meet the millennium development goals by 2015, as agreed by the World Summit on Sustainable Development (WSSD) in 2002. In terms of these goals, water resources are identified as key components for economic development and poverty reduction as well as for the rational use of shared natural resources. In relation to WSSD Objective 7 notes that resource management, including contamination control and water conservation, prioritized environmental sustainability measures incorporating the principles of sustainable development to improve water resources governance. These priorities coincide with those of the GEF International Waters Focal Area.

1.2. Country Programs Context

In 1967, during the First Meeting of Ministers of Foreign Affairs of the countries of the La Plata Basin, the governments of Argentina, Bolivia, Brazil, Paraguay and Uruguay established the Intergovernmental Coordinating Commission (CIC) as the coordinating organization; and, two years later, in 1969, signed the La Plata Basin Treaty, the main legal instrument of the Basin. 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.*" Within the treaty, a series of complementary agreements created different specialized bodies that have been designed with specific competencies in the LPB, 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 independent binational or trinational agreements to focus on specific issues, creating numerous other organizations and programs. This institutional framework for regional integration is reaffirmed by the Asuncion Treaty, which created the MERCOSUR in 1995, as an incentive for intraregional and international trade for the five countries.

The preparation of an integrated water resources management program in relation to climate change and variability was agreed in 2001 during the IV Inter-American Dialogue on Water Management. At that meeting, the President of the CIC, Foreign Affairs representatives of the LPB countries, experts, technicians, and GEF project personnel from the five countries, with GEF support, agreed on the need to develop a Framework Program for the La Plata Basin in order to: "i) coordinate common interest projects for the La Plata Basin countries; ii) carry out projects in water resources management and select concrete prioritized actions; iii) highlight the importance of flood and drought phenomena in the Basin, among others; iv) define sustainable hydrology; and v) promote regional initiatives identified as priorities by two or more countries within the framework of the La Plata Treaty...." To this end, the Meeting of Foreign Affairs Ministers in Montevideo during December 2001 amended the staff schedule of the CIC by adding a technical representative to the then existing political representative from each country — the technical representatives forming the Projects Unit of the La Plata Basin system were charged with the preparation of an Action Plan for the Basin. This Action Plan for the La Plata Basin, approved by the CIC during 2003, identified the main topics of common interest for the regional development of the La Plata Basin:[7]

(i) capacity building on water resources and management to reduce flood and drought vulnerability;
(ii) advancing integrated water and soil management;

[7] CIC No. 2/02-528

(iii) strengthening CIC to enhance regional integration through the existing projects identified in the Basin and preparation of baseline framework for GEF project design for project design;
(iv) implementing a "Digital Map" with updated Basin information, a "Regional Database" and updated "Documentation Center" within the framework of a decision support system the CIC General Secretariat;
(v) promoting environmental preservation through environmental mechanisms compatible with the Basin ecosystems and public participation in environmental management; and
(vi) Harmonizing policy integration among the CIC member states; and
(vii) promoting education and capacity building on common issues.

The preparation of the baseline framework was based upon the common vision of the five countries, defining strategies to guide development in the LPB during the short (5 years), medium (10 years) and long (more than 15 years) terms. Within this context, the CIC requested GEF PDF Block A support to identify the priority transboundary program elements, and GEF PDF Block B support to prepare the baseline framework for the project. The five countries catalyzed their own funds and agreed on cooperation efforts with the WMO and FONPLATA to assist in undertaking these efforts.

1.3. Global importance of the La Plata Basin

The La Plata River Basin, extending over some 3.1 million km^2, is one of the largest river basins in the world. The LPB drains approximately one-fifth of the South American continent. It includes almost all of the southern part of Brazil, the south-eastern part of Bolivia, a large part of Uruguay, the whole of Paraguay, and an extensive portion of the central and northern parts of Argentina, as shown on the map in Annex 2. 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 importance of the LPB and its global priority has been highlighted in global studies such as the GEF/GIWA Project.[8]

The LPB is comprised of three large river systems; the Paraná River, the Paraguay River, and the Uruguay River. The Paraguay River has an average annual flow of 3,800 m^3/s (at Pilcomayo Harbor), the Parana River has an average annual flow of 17,100 m^3/s (at Corrientes), and the Uruguay River has an average annual flow of 4,500 m^3/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^3/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 system of interconnected wetlands is essential to the existence of large biological diversity and productivity, a prominent characteristic of the La Plata Basin.

[8] Global International Waters Assessment, GEF/UNEP/Kalmar University, Sweden.

The availability of large volumes of groundwater demands an integrated approach to the management of surface and groundwater in the LPB, while specific measures and management strategies are required for the management of groundwater aquifer systems. Important groundwater systems include: most of the Guaraní Aquifer System (1,190,000 km^2 in size), one of the largest continental groundwater reservoirs in the world comprised of confined deep groundwater bodies;[9] and the Yrenda-Toba-Tarijeño (SAYTT) Aquifer System, entirely contained within the La Plata Basin in the semiarid *Chaco* of Argentina, Bolivia and Paraguay. Climate change scenarios show an increasing process of desertification within this region, which, when combined with high poverty index values and the presence of indigenous communities, make the SAYTT a top priority for the integrated surface-groundwater management.

A published review by the World Resources Institute defines 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).[10]

Mineral resources, forests, and soil fertility make the La Plata Basin an attractive population region and favors economic development, sustaining 70 percent of the five countries GDP. Present populations exceed 100 million people, with 57 cities having more than 100,000 inhabitants each — including five capital cities: Buenos Aires, Sucre, Brasilia, Asunción, and Montevideo. The Argentine, Brazilian and Uruguayan economies, with a strong agriculture and cattle component, include a significant level of industrial and service production, while Paraguay maintains an agriculture-based economy. Bolivia's economy is mainly based in mining, oil and gas. Nevertheless, agriculture represents an important source of income within the Bolivian part of the La Plata Basin.

This economic development demands communication and multimodal transportation systems, of which the hydrological systems are a fundamental component, interconnecting production, supply and consumption centers and harbors, from which products are exported to different countries. The City of Sao Paulo, one of the largest cities and industrial concentrations in the world, is located in 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 700,000 tons at the beginning of 1990 to 13million tons in 2004, due to lower costs relative to alternative transport means. In the near future, this tonnage is expected to reach 50 million tons.[11]

The important hydrological potential of the LPB, estimated at 92,000 MW, has justified the construction of more than 150 dams, 72 of which exceed 10 MW. Three dams are

[9] A GEF Full Sized Project is currently under execution for the protection and sustainable development of this mega aquifer system.

[10] Revenga, C., S. Murray, J. Abramovitz, y A. Hammond, "Cuencas del mundo," *Valor Ecológico y Vulnerabilidad*, World Resources Institute and Worldwatch Institute, Washington, DC, 1998, 205 pp.

[11] Final Report, "*Consorcio de Integración Hidroviario COINHI*," CIH, 2005.

binational: Itaipú (12,600 MW) and Yacyretá (3,100 MW) located on the Paraná River, and Salto Grande (1,890 MW) on the Uruguay River. Of this hydrological potential, two-thirds is already being used. These dams have not only led to significant social and economic benefits, but also have led to substantial changes in flows, sedimentation, water quality and species composition in these fluvial ecosystems—while providing the framework within which environmental restoration programs, such as the reforestation program of *Cultivando Agua Boa*,[12] are being conducted. The slight improvements in runoff foreseen in the long-term climate forecasts could offer great opportunities for a coordinated approach to dam management.

The La Plata Basin lies in a complex climate region. Climate, modified by short-term events associated with the El Nino/La Nina periodicities exhibited as a result of the thermal oscillations of the Southern Oceans (ENSO) is a determining factor in this heterogenic hydrological system. The relatively scarce rainfalls and high evaporation levels define the arid and semiarid zones (Gran Chaco Americano) in the west of theLPB, while strong rainfalls and runoff, exacerbated in part due to deforestation, characterize the north-eastern zones. The great Pantanal wetland plays a key role in the storage of runoff produced by rainfall in the Alto Paraguay River sub-basin, delaying for almost six months the maximum flows to the Parana River, thereby minimizing downstream flooding.

The economic and social impacts of flooding are very important, as available data for the last 20 years show that the floods on the Parana River are more frequent, intense and longer in duration. These changes in the hydrology of the LPB are certainly related to changing climate factors,[13] which, in turn, are overlain by the constant advance of urbanization and changes in land use. Floods are a major factor in the transport of sediment in the LPB. The La Plata Basin has one of the highest recorded average sediment transport rates of approximately 100 million tons/year in the Parana River (at Corrientes) associated with soil loss and water quality deterioration, which leads to navigation problems and problems of infrastructure maintenance. Most solids come from the Bermejo River basin, tributary to the Paraguay River, where measures to control human-induced erosion are being implemented under the auspices of a GEF IW project.[14] In the Upper Paraguay-Pantanal area, there are significant wetland conservation problems related to increases in sedimentation, and in the *Gran Chaco* soil degradation is the principal issue to be addressed through integrated land and water resources management projects being carried out with GEF support. In addition to these GEF-related initiatives, more than 20 institutions or agencies have been created with direct responsibility to implement water resources use and management strategies in the La Plata Basin.

[12] *Cultivado Agua Boa* is an integrated micro-basin management program implemented by ITAIPU Binational in the Upper Parana River Basin.

[13] See Ferreira, Rosana Nieto, Rickenbach, Thomas M., Herdies, Dirceu L., Carvalho, Leila M.V., *op. cit.*

[14] See *Strategic Action Program for the Binational Basin of the Bermejo River*, May 2000.

1.4. Threats and Barriers Identified during Project Development

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 LPB. In addition, these activities have allowed for the completion of a macro-diagnostic analysis of the LPB that identifies the main transboundary problems and their causes; these were identified in the baseline transboundary diagnostic analysis. These outputs, documented on the website of the CIC (www.cicplata.org), form the first comprehensive overview in the 21st century of this 3 million km^2 basin, at the macro scale. Strong anthropogenic interventions have accelerated the natural dynamic of the LPB and resulted in severe environmental impacts, which dominate development efforts, increase social problems, and threatens the environmental sustainability of the LPB, with the consequent erosion of physical and biological resources. The condition of the hydrological system was confirmed through a wide-ranging participatory process.

The baseline framework identified nine risks facing the countries and communities of the La Plata Basin. Among the present, critical and emerging issues are:

- **Extreme hydrologic events linked to climate variability and change,** particularly in terms of the more frequent, longer in duration, and more intense floods and extensive droughts that periodically affect some LPB communities as a result of the El Nino/La Nina periodicities, with devastating social, economic and environmental consequences. **Gaps in climatic data** and climate knowledge were identified with their consequent limitations on efficiently modelling 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, into the atmosphere through forest fires and crop burns (slash and burn practices) must be included as an element contributing to climate change in the La Plata Basin.

- **Water quality degradation** that result from organic and chemical contaminants from 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. Current development trends show an increasing pressure on the natural resources that demand 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 asses the causes and effects of transboundary environmental issues, and design strategies and identify measures to address them.

- **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.

- **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 hydrographic basin as well as longer-term and larger-scale climatic variations that affect the LPB.

- **Unsustainable management of fisheries 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 La Plata River and for the indigenous settlements and poorer (disadvantaged) population sectors dependent upon it for subsistence and livelihoods.

- **Unsustainable management of aquifers** in critical recharge and discharge zones has the potential to modify base flows in the La Plata River, and create further ecological modifications affecting human and natural uses of the aquatic systems of the La Plata Basin. Unsustainable abstraction of groundwater and the salination and contamination of groundwater resources can have similar impacts throughout the LPB, especially in the semi-arid *Chaco* (Argentina, Bolivia, and Paraguay.) Remediation of this unsustainable situation demands an integrated surface and groundwater resource management approach to accomplish shared development goals, while maintaining the underlying structure and function of the aquatic ecosystems that, in their totality, comprise the La Plata Basin.

- **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 the recognition of the La Plata Basin as a single hydrological resource, continued sectorally 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 LPB in a sustainable manner, especially in the face of climate variability and change.

- **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. Understanding the natural periodicity of hydrologic events, identifying potential changes in such periodicity, and planning for accident responses present opportunities to reduce the magnitude of negative impacts and effectively utilize the opportunities presented by increased runoff and availability of flows.

- **Unsafe water and environmental sanitation conditions** produced as a result of contamination and deterioration of water quality have effects on human and ecosystem health. It is important to note the coincidence of urban development with insufficient sewage treatment and the increase in cyanobacteria, which can form toxic varietals. Cyanbacterial blooms are further aggravated by agricultural runoff, industrial discharges, and anthropogenic river flow modifications. Resolving this issue demands greater financial support for water and waste management, mainly from national sources, and has a great importance in terms of its transboundary aspects. Wastes, wastewater, and associated contamination arising from both point and non-point sources, or generated *in situ*, can be transported downstream to affect communities other than those generating the contaminants, with concomitant human and ecosystem impacts.

Underlying these risks, are eight barriers or impediments to change that potentially limit the effective response to these challenges by the LPB countries. The Macro-Transboundary Diagnostic Analysis, conducted during the PDF-B process, enabled the identification of the principle existing barriers to be overcome or mitigated. To overcome these barriers, it is necessary to consider not only the insufficiency of budgetary allocations by national institutions, which limit the implementation of the Action Plan, but also the necessity for an integrated vision of the basin. Both aspects are closely related to an understanding of the complete hydrological cycle—and, therefore, of its vulnerability to short term climate variability and long term climate changes, as well as to an understanding of the active stakeholder involvement in creating and maintaining demands for water in addition to the natural demands imposed by the ecosystem. The 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 LPB 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 LPB 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 LPB-wide framework, and in turn allow 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 regarding 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. The CIC has a remarkable planning, management and coordination structure, as defined in the Treaty of the La Plata Basin, but is limited by its weak technical attributes. The new statute (2002) affirmed both the institutional and technical role of the CIC in the LPB, and strengthened the countries' command over the decisions of CIC. However, the national organizations that are working on issues of common concern focus on national priorities, and have not used the CIC to its fullest potential to address activities of a transboundary nature. This limits the ability of the CIC to develop and

transfer knowledge within the LPB. Furthermore, some asymmetries were identified in implementing an integrated management policy within the LPB as a whole, due to the diversity of national objectives and their differing legal and institutional frameworks. 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 LPB water resources management is a common feature in the five countries. An information network for the LPB is being developed by the CIC Secretariat, utilizing in part GEF-Block B funds and counterpart contributions from FONPLATA and CONICET (Argentina) This network, however, by itself, is insufficient to redress the institutional weaknesses inherent in the La Plata Basin.

- **Lack of an integrated water resources management vision** reinforces sectoral biases, and scant information from existing meteorological stations in key regions of the LPB limits awareness of the connectivity that is inherent in the component 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 LPB.

- **Inappropriate land and soil use**, resulting from the expansion of the agricultural frontier, and the encroachment of surrounding urban areas, has contributed to deforestation and soil erosion, with concomitant effects on the regional and global climate. Marginal and fragile zones have been converted to production due to exceptionally high international grain prices, 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 hydroelectric production capacity and dam capacity providing water for other human uses. 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.

- **Uncoordinated models for dam management at the Basin scale.** The natural changes in topography that occur within the La Plata Basin have created opportunities for humans to exploit these head differences by the strategic placement of dams. These

dams have provided the energy and regulation of river hydrodynamics that support other human economic activities. The dams are managed using models, which include regional information. However, the models are limited to specific impoundments and single purpose operations; such models face difficulties when applied to the management of the multi-purpose operations occurring at the LPB scale. These models can be improved, with wider climate forecasting and the inclusion of accurate data in their design, to yield greater social, economic, and environmental benefits. The implementation of a holistic system-wide program requires further planning before models can be used for integrated resource management and formulation of responses to climate variability and change.

- **Interferences in fluvial ecosystem dynamics**, such as overexploitation of commercial fish species in some regions, have affected the richness, volume, and quality of this renewable resource. The construction of dams in the Paraná and Uruguay rivers, while providing hydroelectric benefits to human developments, has had an impact on fish migrations, biological cycles and ecosystem tropical zones. Similarly, the introduction of exotic species, like the "*maillot Dorado*," to provide nutrients in the nutrient-poor tropical zones of the La Plata system, has had a negative impact on investments and infrastructure, especially in the water supply sector, as well as on the native species present in the waters of the La Plata Basin. These latter impacts have the potential most significantly affected disadvantaged communities' dependent upon the La Plata River for subsistence.

- **Urban development models with low levels of resource allocation, and marginal and poor settlements**, have a direct connection to unsafe water supplies and environmental deterioration through discharges of solid waste treatment residues and sewage (domestic, industrial and pluvial). Although flooding in floodplains and coastal zones is a natural and desirable process within normal levels, the last decades, with intensive urbanization, increased impervious surfaces and imposed (partial) canalization, have generated the new phenomenon of urban flooding, with devastating human consequences and economic impacts. These are especially severe in areas where land use is poorly regulated, such as areas of informal settlement characteristic of disadvantaged communities. Such occurrences are strongly exacerbated by climate change and variability, which create less predictable sequences of flood and drought, greater variability in water level elevations, and seemingly more erratic and severe occurrences of extreme events.

1.5 The Effects of Scale

Even though the threats and barriers summarized above are common throughout the LPB in general, their impacts and intensities vary considerably between sub-basins. Consequently, the mitigation of their most significant impacts on both humans and ecosystems require regional-level actions in the different sub-basins. These variations in levels of impact in the major component sub basins of the La Plata Basin are summarized below. These differences in emphasis, identified during the PDF-B activities, are reflected in the project components, set forth in Section 3 below, by the locations of

specific pilot demonstration projects in critical areas representative of specific concerns and providing the best opportunities for development, application and assessment (of economic and technical feasibility) of specific interventions to address these concerns. Successful and feasible interventions can be subsequently disseminated more widely within the LPB during subsequent phases of the program.

- **Upper Paraguay** (to its confluence with the Apa River, including the Planalto and the extensive Pantanal wetland). The Pantanal acts as a great dam in the headwaters of the La Plata system, retaining enormous and increasing amounts of sediment originated from agriculture on the Planalto. Sediments are a great threat to the species richness of this wetland ecosystem. A key feature of this area is that it acts to maintain a low level of runoff, limiting major flooding downstream on the Paraguay River and on the already affected Parana River. The GEF supported project on the Upper Paraguay and Pantanal in Brazil has led to a completed Strategic Action Program, and the proposal to incorporate Paraguay and Bolivia into a subsequent phase of the project. ITAIPU Binational is supporting citizen-based reforestation programs within this sub-basin and The World Bank has supported projects in micro-basins to limit soil loss and restore riverine vegetation, programs that need to be maintained and replicated.

- **Lower and Middle Paraguay River** (downstream of the Apa River to the confluence with the Parana River, including the *Gran Chaco Americano* biome to the east). The Paraguay River, in spite of the upper basin flows received, has a negative hydrological balance. Along the main river course, floods frequently affect the City of Asuncion, capital of Paraguay. This portion of the Paraguay River is an important part of the Paraná-Paraguay Waterway. This portion of the Paraguay River is affected on its right margin by two tributary systems, the **Pilcomayo** River and **Bermejo** River, which greatly affect its water quality. 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 with Argentina, Bolivia, and Paraguay to elaborate a Basin Plan. The Bermejo River has a similarly high level of sediment production, transporting more than 70 percent 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 to address the anthropogenic portion of this erosion, sustainable development, and water resources management in an integrated way. The *Gran Chaco Americano* is located on the western side of the LPB in an important semiarid region. The GEF has recently approved a PDF Block B grant to fight land degradation in this region, which overlies the Yrendá-Toba-Tarijeño Aquifer System (SAYTT).

- **Upper Paraná River** (upstream of the confluence with the Iguazú River). This sub-basin has the highest number of dams, which has diminished the river flow. The high deforestation rates expose the soils, making them more vulnerable to erosion. In the last decade production activities, such as pork farms, intensive agriculture and cattle have also intensified, increasing the production and deposition of organic effluents in

the river. Urban fluid waste from major cities, such as Brasilia, adds to all these factors accelerating the euthrophication process of the Upper Parana River. Micro-basin management projects are being implemented to address this issue. Among them, the project *Cultivando Agua Boa,* implemented by ITAIPU Binational, deserves a special mention. The hydrological balance has been positive.

- **Lower and Middle Paraná River** (from the Iguazú River to its confluence with the La Plata River). The main characteristics of this region are great floodplains and wetland corridors, some of which, such as the Ñambucú, Iberá and Delta del Paraná, are very extensive. Some wetland areas are under protection, like the Esteros del Iberá, but without a common and joint management policy. These systems are strongly dependant on surface and groundwater systems. This portion of the La Plata Basin is the primary navigational area for the Paraguay-Paraná Waterway and is occupied by the Yacyretá Dam, the first obstruction to fish migrations during their upstream reproductive journey. There are many important cities along its margins, which are frequently affected by the Parana River floods. These communities have been motivated to install alert systems, particularly in Argentina.

- **Upper Uruguay River** (to the Garabí River). The river originates as runoff from the basaltic strata of the Planalto of Río Grande do Sul and Santa Catarina, and drains, as a low gradient stream, toward the Campos Sulinos. This portion of the LPB is subject to a variety of agricultural land uses, with rice, soybean and grain crops being more common in the upper zone, while in the lower regions, with a greater number of dams, rice crops predominate. This is a great pork and poultry production area, runoff from which contaminates the river.

- **Lower Uruguay River** (downstream of the Garabí River to its confluence with the La Plata River). In this part of the LPB there are some conflicts between the use of water for irrigated rice production, city supplies and ecological flows, particularly in the Cuareim-Quarai River sub-basin that forms the boundary between Brazil and Uruguay. The hydroelectric dam on the Uruguay River (Salto Grande) creates hydrological alterations, including coastal erosion, and aquatic biodiversity alterations in the river. The Lower Uruguay River has a series of islands and coastal wetlands that potentially could serve as a development focus for ecotourism and nautical activities. CARU, in the Lower Uruguay River, is the responsible organization for water quality monitoring and control for Argentina and Uruguay. Current development trends show an increasing pressure over the natural resources that demands a water quality monitoring system.

- **Río de La Plata**. The La Plata River is the last part of theLPB's waterways, through which the Parana and Uruguay rivers discharge into the South Atlantic. Its main feature is the confluence with oceanic water and the high levels of nutrients and numbers of fish species with high commercial value. In its coastal zone is the City of Buenos Aires with its port, which is affected by the great volume of sediment deposited from the Parana River and by waste discharges from the high concentration of industrial settlements, and the City of Montevideo and coastal seaside of Uruguay.

The La Plata River and its maritime front are being studied by FREPLATA, co-financed by the GEF.

1.6 The Over-riding Impact of Climate Change and Variability

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, had a 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.[15] These climate change scenarios examined over a 30-year period during which precipitation in the La Plata Basin was forecast to increase by between 10 percent and 15 percent on average, with increases of up to 30 percent in specific areas of theLPB. These changes in rainfall affect land use and soil loss, and have the potential to upset the delicate balance between precipitation and evaporation in the LPB. At the basin level, these changes have the potential to increase the risk of flooding, especially when rainfalls consistently exceed historical levels. These scenarios are based on a variety of climate models, all of which demonstrated a consistency of output suggesting a trend toward increasing precipitation.

Notwithstanding, 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. These 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 LPB, 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 increased periodicity in precipitation, 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 reduce seriously the availability of hydroelectric power generation potentials. As hydroelectric power currently supports much of the economic development in the five La Plata 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 presented below.

[15] Ferreira, Rosana Nieto, Rickenbach, Thomas M., Herdies, Dirceu L., Carvalho, Leila M.V., *op. cit.*

Año	Río Paraná, en Posadas, (m3/seg)	Superficie afectada (millones de ha)	Pérdidas económicas (millones USD)	Número de personas afectadas
1982-1983	50.882	4.0	1.790	177.035
1992	48.790	3.0	905	133.106
1997-1998	33.000	18.5	17.502	121.348

Fuente: PNUMA/UNEP - 2004

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 La Plata Basin-specific models.

2. Rationale and Project Objectives

The sustainable development and management of the LPB requires the efforts of all five countries to take advantage of the opportunities and overcome the barriers to resolving the critical transboundary issues summarized in Section 1. No one country alone can address all of these issues and concerns. Therefore, integration of the independent, country-level actions is one of the main objectives of the CIC. This project contributes to the fulfillment of that promise.

2.1 Rationale for the Project

The preparation of an integrated water resources management program in relation to climate change and variability was agreed in 2001 during the IV Inter-American Water Management Dialogue, which took place in Foz de Iguazú, Brazil. At that meeting, the president of the CIC, foreign affairs representatives of the La Plata Basin countries, a group of experts, technicians, and GEF project staff from the five countries with expertise in water management, climate and transboundary waters, with GEF support, agreed on the need to develop a Framework Program for the La Plata Basin in order to "i) to coordinate common interest projects for the La Plata Basin countries; ii) to carry out projects in water resources management and select concrete prioritized actions; iii) to highlight the importance of the LPB flooding and drought phenomena, among others; iv) to define sustainable management of water resources and promote regional initiatives, identified as priorities by two or more countries; v) to consider the La Plata Treaty, its institutional system, and existing programs and projects to avoid duplication and to complement and collaborate with the current CIC framework."

The need for technical management capacity in the La Plata Basin, within the framework of the CIC, was addressed by the Foreign Affairs Ministers Meeting, which took place in Montevideo, during December 2001. This meeting authorized the appointment of a second, technical representative by each LPB country, in addition to the then existing

political representative. The technical representatives formed the Projects Unit of the La Plata Basin. This unit completed the **Action Plan**, adopted by the CIC during 2003 that formed the basis for the preparation of the Framework Program. The framework program outlined a common LPB vision guiding the development of short term (5 years), medium term (10 years) and long term (more than 15 years) development scenarios. Within this context, the CIC requested GEF PDF Block A support to identify the priority transboundary program elements and GEF PDF Block B support to prepare the baseline TDA project. The five countries catalyzed their own funds and agreed on cooperation efforts with the WMO and FONPLATA to assist in undertaking these efforts.

In the absence of such a Framework Program, the development in the LPB will continue in a haphazard manner. Issues such as flooding and drought management (including adaptation to climate change and variability), erosion and sediment transport, water contamination, energy generation and navigation problems, the lack of alert systems, loss of biodiversity and wetlands will continue to be only partially addressed, individually by each country.

The formulation of the Framework Program constitutes a first step in ensuring a holistic La Plata Basin-wide integrated approach to the management of theLPB. This proposed project through the formulation of an agreed SAP will further strengthened this holistic and integrated approach to the management of the LPB.

2.2. Project objectives

The overall project **objective** is to strengthen transboundary cooperation among the riparian country governments of Argentina, Bolivia, Brazil, Paraguay, and Uruguay[16] to ensure management of shared water resources of the 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 water resources within the context of climate variability and change. This basin-wide project builds on existing projects and programs coordinated and executed by the Intergovernmental Coordinating Committee for the LPB countries (CIC), and by bi-national and tri-national committees created under the La Plata Basin Treaty (LPB Treaty); and provides context for, and linkages between, ongoing GEF-supported efforts within the LPB. This GEF project, sufficiently supported with 82 percent co-financing, promotes synergies between GEF focal areas, to increase the resilience and adaptive capacity of the LPB stakeholders in preparing a basin-wide structured menu of concerted adaptation measures that were identified in the vulnerability and adaptation assessments, and then promulgated and endorsed in the SAP. The project objective, purpose and strategic GEF objective are detailed in Annex 1 Project Results Framework, of the Project Document.

[16] The riparian governments operate within the framework of the Intergovernmental Coordinating Committee for the LPB countries (CIC), as the agreed intergovernmental organization set forth for this purpose in the La Plata Basin Treaty.

The **result** of the project will be such that the governments of Argentina, Bolivia, Brazil, Paraguay and Uruguay will coordinate actions and investments in the La Plata Basin to achieve sustainable utilization of water resources, and initiate the process of adapting to climate variability and change, mitigating their negative impacts, and capitalizing on the opportunities that such variability and change may provide. These multiple approaches reflect the complexities of the LPD, the regional distribution of priority concerns, and the diversity of ecosystems, while recognizing the unifying role of the La Plata River and the connectivity of the upstream and downstream portions of the hydrologic system.

The proposed project will advance recommendations set forth in the Framework Program to formulate a detailed TDA and SAP, taking into account the implementation plan and financing strategies agreed by the LPB countries. The project also responds to recommendations adopted or proposed in the National Communications, in the case of Argentina and Brazil, the Second National Communications, prepared pursuant to the country obligations under the United Nations Framework Convention on Climate Change (UNFCCC) for the preparation of scenarios for adaptation to climate variability and change, which are wholly integrated into the Framework Program.

3. Components/Activity Program and Expected Results

This proposed project includes the following four Components: (i) strengthening basin-wide cooperation capacity for integrated hydro-climate management; (ii) Integrated Water Resources Management; (iii) hydro climatic models and scenarios for adaptation planning, and (iv) TDA and SAP formulation. The "identified executing partners" for each Subcomponent (including each country's public, private, and academic organizations, among others) will receive GEF support to execute their portion of the Work Program. These executing partners were identified during the project preparation process, without limitation or obligation, pending initiation of project activities. The Project Document's Annexes, provide additional information on the project organization, (Annex 7 Component Structure); Table 1 is a schematic work program illustrating the anticipated schedule for implementing the project, is further detailed in Annex 5 Work Program; and the sub-component outcomes, outputs and activities (Annex 1 Result Framework)

Component I: Strengthening Basin-wide Cooperation Capacity for Integrated Hydro-climate Management

Overall Objective: To establish the technical and legal conditions necessary for providing the participating institutions with the management capacity for the formulation of the SAP and its subsequent implementation. The purposed is to develop a harmonized legal framework for the La Plata Basin for the integrated water resources management based upon plausible climate change scenarios, and to provide coordination and oversight capacity for project planning and management.

Subcomponent I.1: Harmonizing the Institutional and Legal Framework

The five countries of the La Plata River Basin represent widely differing legal regimes and technical and institutional capacities. This Subcomponent objective is to develop a standardized framework within which the five countries can readily and effectively communicate with each other. Through the activities elaborated below, specific technical capacity and institutional strengthening activities will target gaps identified during the project formulation period to enable the five countries to interact. In addition, a similar review of country legislation will contribute to the ability of the five countries to coordinate planning, enforcement, and management actions within their jurisdictions for the benefit of the LPB as a whole. Differences in legislation will be identified and recommendations provided to ensure consistent application of environmentally sustainable measures throughout the LPB. The overall outcome provides institutionalized 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

Work Element I.1.1 Strengthening Technical Institutional and Capacity Building (for integrated management of the LPB), this Element is comprised of three activities that will develop: (i) horizontal cooperation programs among the participating countries, based on initial needs assessments and conduct of an institutional analysis;[17] (ii) technical and management capacity building, based on training courses to execute the various components and activities of the SAP; and (iii) inter-institutional knowledge exchanges for advanced students to collaborate with the Project national executing institutions, based on public announcements and an Operational Procedures Manual to be defined before the start of the Framework Program execution.

Element I.1.2 Conceptual of Legal Frameworks. Based on studies to be carried out with the support of workshops and technical meetings to be convened with the participation of political representatives and experts, this 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: (i) identification, systemization and dissemination of concepts, legislation and institutional structures related to national, regional and international water-related environmental issues; and (ii) elaboration of key components for a conceptual framework for proposed legal and institutional harmonization. The activities will be developed in consideration of the long term goal of a harmonized and integrated water resources management system for the La Plata Basin, and will include generation of proposals for consideration by the LPB countries for inclusion within their national legal frameworks—adoption of any new or refined legislation relating to the integrated management of the water resources of the La Plata Basin remains subject to the constitutional processes of each

[17] This activity will utilize the institutional mapping tool developed under the auspices of the UNEP-OAS GEF-IW project on the San Juan River Basin in Central America to identify and analyze the relationships between agencies and organizations within and between the Basin countries. As such, this element contributes to the technology transfer elements of the San Juan project as well as enhancing understanding of the organizational climate of the La Plata River Basin.

of the LPB countries and to collective action by the five governments within the framework of the CIC, as well as action by the provincial and state authorities as required in the federal countries. A first step in this regard will be the determination of shared water quality indices and standards.

Element I.1.3. The LPB-Decision Support System. The purpose of this effort is to establish the groundwork to access, articulate, process, integrate information concerning the LPB, and make it available to the GS/CIC, in support of decision making for the integrated management of water resources. The system mainly focuses on the high risk, extreme hydrological events (floods, droughts and water pollution, and alerts for natural and anthropoid 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. 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).

Results for Subcomponent I.1:

a) National Project Units (NPUs) installed and operating as a mechanism for the Inter-sectoral and Inter-ministerial coordination and collaboration.

b) Systematized and organized information within a Decision Support System for the integrated Management of the Water Resources in the La Plata Basin, pursuant to Activity II.2, centralized in the CIC, and with direct access from the five countries (through a network comprised of five identical mirror centers allowing access to the central data base through national gateways). The System will include the Digital Base Map of the Basin.

c) Agreed upon collaboration with the Foreign Affairs Ministries of the five countries to deliver requested data and technical advice to the National Coordinators.

d) Proposals to harmonize the conceptual, legal and institutional framework necessary to carry out strategic actions addressing resource management.

e) An organized, effective and consolidated structure for the execution of a future SAP (during the fifth year of Project execution).

f) A stronger CIC as the permanent organization to promote, coordinate and follow up on multinational water resources management actions and harmonized development in the region, as established in the Treaty of the La Plata Basin and its associated statutes.

g) An administrative system for the implementation of the SAP, within the CIC, with country members and NPUs, equipped with the capacity to perform the necessary follow up.

Identified responsible institutions: The activities will be carried out by the CIC Secretary General, in cooperation and association with the federal and state agencies of the country governments, including, among others, the Subsecretaría de Recursos Hídricos, Secretaría de Ambiente y Organismos Provinciales and CONICET in Argentina; the Viceministerio de Recursos Naturales y Medio Ambiente del Ministerio de Desarrollo Sostenible in Bolivia; the Secretaría de Recursos Hídricos y la Agencia Nacional del Agua del Ministerio del Ambiente in Brasil; the Secretaría del Ambiente de la Dirección General de Protección y Conservación de Recursos Hídricos in Paraguay; and the Dirección Nacional de Hidrografia del Ministerio de Transporte y Obras Públicas in Uruguay. The sectoral activities within Component I are included under the responsible institutions' respective institutional responsibilities, which will be included in the respective NPUs.

Financing: This Subcomponent I.1 will be executed throughout the 5 year Program. The financing is as follows: GEF US$ 1,958,756; Government counterpart US$ 2,823,850; other co-financing US$ 137,000 (total co-financing US$ 2,960,850) and sub-component total US$ 4,919,606.

Subcomponent I.2: Stakeholder Participation, Communication, and Education.

As part of the Framework Program, 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). In order to achieve this purpose, the following activities are proposed in the Plan:

(i) enhancing the database and interaction with stakeholders identified by the Institutional Mapping Tool;
(ii) specifying new coordination and articulation activities 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 of the TDA and the SAP;
(v) communicating and disseminating information on the framework strategies of the Basin;
(vi) executing environmental education activities and training in IWRM, and promoting comprehensive stakeholder participation;
(vii) 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 four pilot demonstration projects and three priority projects (Component II) to be executed with local communities.

It is further expected that representatives of the participating communities in these pilot demonstration and priority 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. Subcomponent I.2 focuses on communication and promotion of public participation, as well as education for responsible and conscious participation by stakeholders and civil society, together with the establishment of a Public Participation Fund (PPF). The expected outcome is enhanced communication and public participation increase stakeholders and civil society public awareness, facilitated through the Public Participation Fund (PPF), engage in basin

activities and formulate the SAP.

Element I.2.1 Public Participation Program. The objective of this Element is 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. This activity will focus on access to information in the La Plata Basin, such as technical information from the TDA and its root cause analysis, and the proposals for remedial actions (Framework Program/SAP) to ensure a responsible and fully informed constituency. The General Secretariat of the CIC will continue to coordinate this activity with the assistance of local experts in the preparation and implementation of the Communication Plan under the SAP. The CIC also will coordinate all activities related to the preparation and dissemination of informational materials and public information. The project will consider using the following media:

- CIC Web page: www.cicplata.org;
- Online interactive virtual fora;
- Monthly bulletins;
- Videos and TV spots;

With the support of sponsors, creation of a Publication Fund for the La Plata Basin, including, *inter alia*, thematic publications;

- Database of press cuttings and information bulletins;
- Contests and festivals related to relevant thematic issues in the Framework Program/SAP.

Element I.2.2 Public Awareness Education Program. An important part of Subcomponent I.2 relates to the educational and capacity building activities to strengthen the public participation process in the Project. The objective of this Element is to incorporate into the Project the technical capacities and scientific knowledge of the various academic institutions in the LPB and complement them with education and training in IWRM. Special emphasis is on climate and hydrologic warning systems, prevention and adaptation to climate change and variability and their effects on the hydrology of the LPB, 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 LPB. 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.

Element I.2.3 Public Participation Fund (PPF) for the IWRM. 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.

There will be a **first call** for proposals geared towards civil society organizations and basin organizations, municipalities and private companies, for the presentation of project initiatives, in the following two critical issues:

- 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 impacted by the operation of dams and threatened by the modification on land use 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 for its recovery and maintenance in response to perturbations due to the impacts of climate change. Public and private participation in land tenure issues are critical to ensuring the implementation of protection measures.
- Adaptation to the effects of climate change and variability, implementation of clean technologies development for replication throughout the La Plata Basin, and conjunctive use of surface and ground waters.

A second call for proposals will take place to encourage the generation of knowledge, support for capacity building and improved communication with respect to critical basin issues, with the participation of universities and educational centers, on the following two aspects:

- Innovative approaches to sustainable water resources management and their relationships to climate change and variability with a view to strengthening capacity in the basin countries through supporting post-graduate studies, and
- Communications and informational projects on critical issues identified in the Framework Program to be executed by "centers of excellence" within the La Plata Basin.

Results for Subcomponent I.2

a) Internet-based communication system including on-line virtual fora, informational materials (newsletters, video and TV spots, etc.); an established and operational Publication Fund; a press database; and thematic contests and festivals.

b) Courses and seminars designed and implemented; and manuals, teaching and educational materials prepared, contributing to:

- Enhanced environmental education, measured in number of participants in courses and seminars promoted by the Project,

- Published educational materials relating to priority issues identified in the Framework Program,
- At least 20 courses offered in identified "centers of excellence" (or through mobile and/or distance learning courses) and implemented within the framework of the Project,
- Dissemination of environmental education course materials, including environmental education documentation from other GEF projects

c) 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.

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. 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. 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.

Financing. The Subcomponent I.2 will be executed throughout the five years of the project. Total US $ 1,021,280. (GEF, US $ 655,000; counterpart, US $ 366,280).

Subcomponent I.3: Monitoring and Evaluation of the Plan

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 components: (i) Monitoring of progress; and (ii) 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. The outcome for this subcomponent that the progress and performance in all project components, and achieving the development objective are monitored and evaluated with satisfactory ratings.

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 (Annex B), 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 set forth in

Annex E. 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 for Subcomponent 1.3

a) M&E Plan in place.
b) 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.

Identified responsible institutions: The OAS, CIC and executing institutions in each country, as well as UNEP will execute this task.

Financing. The Subcomponent I.3 will be executed throughout the five years of the project. Total US $ 398,000. (GEF, US $ 100,000; counterpart, US $ 298,000).

Component II: Integrated Water Resources Management

Overall Objective: To provide the diagnostic and feasibility analyses, implementation costs, and technical information necessary to formulate a Strategic Action Program for the La Plata Basin. To synthesize and compile the information gathered from scientific investigations, feasibility studies, and institution/capacity assessments into a management strategy for the LPB.

This Integrated Water Resources Management Component will include elements necessary for the development and implementation of the principles of integrated water resources management in the La Plata Basin. This Component will generate replicable management measures to implement practices promoting sustainable resource utilization in the LPB. The Outcomes of subcomponent II.2 will inform the formulation of the basin-wide TDA and SAP, to be compiled under Component IV, looking *inter alia* at providing the conceptual framework for groundwater management, at the harmonization of national biodiversity strategies within the La Plata Basin, consolidating the actions of the LPB countries under the United Nations Convention on Biodiversity, formulating a dynamic information system with integrated water balance data for the whole LPB to support an integrated management program, and quantified water supply and demand information, specifically including water for hydroelectric generation, agricultural activities, transportation, recreation and commercial activities, municipal use and sewage discharges, as well as producing the framework for a water quality baseline for the LPB and a protocol for monitoring.

Subcomponent II.1 LPB Integrated Water Balance. The objective is to develop an Integrated Water Balance for the La Plata River as a support instrument for the integrated management of the water resources in the LPB, considering the distribution, quality, use and demand for water. This Element includes five activities: (i) development of a work methodology, with UNESCO-IHP support; (ii) elaboration of the surface and ground water hydrological balance; (iii) evaluation of resource supply

and demand; (iv) elaboration of an integrated water balance; and (v) dissemination of results.

Results for subcomponent II.1:

The results include a dynamic information system with integrated water balance data for the whole LPB to support an integrated management program, and quantified water supply and demand information identified by present and future LPB population, specifically including water for hydroelectric generation, agricultural activities, transportation, recreation and commercial activities, municipal use and sewage discharges.

Identified responsible institutions. 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.

Financing. The Subcomponent II.1 will be executed throughout the five years of the project. Total US $ 1,603,525; with GEF, US $ 370,000; counterpart, US $ 1,233,525, co-financing US $ 250,000).

Subcomponent II.2 Water quality assessment and monitoring. 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 Element will include the following six activities: (1) strengthening existing monitoring systems (including the ones developed under GEF projects) and implementing shared databases and operational plans; (2) capacity building and network optimization plans; (3) 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; (4) applying existing mathematical models in the La Plata Basin, and implementing and identifying data needs in critical areas for the formulation of future scenarios; (5) preparing a proposed normative framework for water quality assessments in shared rivers; and (6) capacity building programs with workshops, seminars and courses, together with professional exchanges among the different responsible organizations, joint field work and inter-calibration programs for participating laboratories.

Results: A water quality baseline for the LPB 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. Completed contingency management plans, support structures, and technical information for the development of common policies on water quality, and equipping of stations and personnel.

Identified responsible institutions: This element 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), organisations and institutions for water resources and environment of the Brasilian 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.

Financing. The Subcomponent II.2 will be executed throughout the five years of the project. Total US $ 2,958,821. (GEF, US $ 1,391,500; counterpart, US $ 1,367,321, co-financing US $ 200,000).

Subcomponent II.3 Integrated Groundwater Management. The objective is to develop information and preliminary guidelines for the integrated management of the surface and ground water resources of the La Plata Basin, based on the experiences of the Guarani Project and the execution of the Project for the Management of the Yrendá Toba Tarijeño Aquifer System (SAYTT) within the semi-arid *Chaco*, with the support of the ISARM Americas Program and with the cooperation of the Italian Ministry of Environment, and the European Union. This Element includes the following six activities: (i) development of a conceptual methodology for the integrated management of surface and ground waters in the La Plata Basin (including elaboration of a geo-referenced database of the main aquifers and schematic maps, at best possible scale); (ii) integration of regional experiences; (iii) strengthening of legal and institutional systems for the protection and management of groundwater; (iv) identification of implementation criteria and methodologies for experience transfer, and validation of the proposed methodologies; (v) execution of a priority project for the SAYTT (see Annex 8 for detailed description of the project), including the formulation of a specific Transboundary Diagnostic Analysis and Strategic Action Plan; and (vi) application of the conceptual framework for the integrated management of the transboundary aquifers of the La Plata Basin in the selected aquifers.

Results. An inventory of the La Plata Basin transboundary aquifer systems integrated into the CIC Information System. A proven methodology for the integrated management of surface and ground waters, based on the experience of the Guarani Aquifer and the SAYTT demonstration project. A specific TDA and SAP for the SAYTT, including its continued recharge and maintenance of its water quality. An assessment of priority aquifers for the implementation of the conceptual framework, and a characterization of selected transboundary aquifers.

Identified responsible institutions: National program executing agencies and National Project Units, INASLA and CRAS-INA from Argentina; national executing institutions of the Program, Servicio Geológico Técnico de Minas (SERGEOTECMIN) and the

Departamento de Hidrogeología del SENAMHI in Bolivia; Secretaría de Recursos Hídricos/Ministerio do Meio Ambiente, Agencia Nacional de Águas, IBAMA, Ministério das Cidades, and the Serviço Geológico Brasileiro (CPRM) in Brazil; 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 in Paraguay; and Dirección Nacional de Medio Ambiente and Dirección Nacional de Hidrografía in Uruguay.

Financing. The Subcomponent II.3 will be executed throughout the five years of the project. Total US $ 2,530,385. (GEF, US $ 1,018,800; counterpart, US $ 1,183,585, co-financing US $ 328,000).

Subcomponent II.4 LPB Ecosystem Management. The objective is to harmonize national biodiversity strategies within the La Plata Basin, consolidating the actions of the LPB countries under the United Nations Convention on Biodiversity. Joint actions of the five countries will be out to preserve and manage the biodiversity of the LPB, with a particular focus on wetlands, coastal ecosystems, and biological corridor conservation, sustainable fishing, and exotic species control.

Activities will include the definition of guidelines for Water Related Biodiversity Management in the La Plata Basin, while considering the integration, articulation and development of complementarities with existing GEF biodiversity projects in the LPB, Cultivando Agua Boa priority project and Biodiversity project. The guidelines will lay out common strategic actions at basin level, to preserve and sustainable manage biodiversity according to the rules of the five countries, implemented pursuant to their national strategies developed in terms of the Biodiversity Convention. The proposed actions will take into account the extensive coastal wetland corridor of the La Plata Basin, which links the Pantanal with the Delta del Paraná on the La Plata River, including the Parana hydrological system, which is one of the world's most diverse and biologically productive wetland systems). It will also include the design of the priority project between Itaipú-Pantanal, the implementation of a system of protected areas for the protection of aquatic ecosystems and their associated ecotones, the integration of ecological corridors (including habitat identification and implementation of a ecological corridor to serve as a pilot experience) with monitoring and control of transboundary contaminant flows to aquatic and terrestrial habitats. The project will carry out the priority project in the Itaipu drainage area, Cultivando Agua Boa, which will include the management of solid wastes and recycling programs, youth gardening and the participation of indigenous communities, cultivation of medicinal plants, the promotion of organic farming and adoption of sustainable agricultural and fisheries practices, leading to protection of biodiversity and environmental health throughout the region. This latter priority project will make use of a revolving fund, utilizing revenues from water charges to secure investments in priority areas ("hot spots") within the drainage basin. This priority project will serve as the basis for similar public-private partnerships proposed for other areas of the LPB.

Results: A harmonized LPB-wide regional strategy for biodiversity conservation consistent with the objectives and requirements of the Biodiversity Convention. It will include a strategy of conservation and sustainable use of the fluvial wetlands and ecosystems of the Paraguay, Paraná, Uruguay and La Plata Rivers, integrating as a pilot experience the ecological transboundary corridors of aquatic and terrestrial habitats (Itaipú-Pantanal riverine corridors and wetlands) and sustainable management of fisheries resources and aquaculture (considering exotic species control protocols). Program activities will result in socio-economic assessments based on biodiversity conservation, and identification of economic opportunities associated with such conservation. In the case of the Cultivando Agua Boa priority project, a replicable public-private partnership program, based upon the foregoing results, will be established.

Identified responsible institutions: 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 (see Component V).

Financing. The Subcomponent II.4 will be executed throughout the five years of the project. Total US $ 8,606,500 (GEF, US$ 900,000; counterpart, US$ 106,500, co-financing US$ 100,000, other counterpart US$ 7,500,000).

Subcomponent II.5 Controlling Land Degradation. The objective is to harmonize national actions related to the control of land degradation within the La Plata Basin, consolidating regional strategies under the United Nations Convention on Desertification. Include compilation of available soil information, integrated at a coherent scale, within the La Plata Basin, and to synthesize assessments and analyses among the five countries, as a basis for harmonized action, including identification of degraded critical areas, integrating water and soil concerns. Existing related information from 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 work elements to be carried out will permit (i) articulation and complementation of actions with existing projects related to the issue within the La Plata Basin; (ii) harmonization and dissemination of existing best practices at the basin level; (iii) elaboration of a common soils map showing the extent of degraded areas, soil suitability, regional erosion susceptibility (erosion risk) and potential for impacts on water resources; (v) design a priority project in the critical ecosystem of Selva Misionera Paranaense, including the formulation of a diagnostic analysis of the current situation and proposed measures to mitigate erosion and rehabilitate lands, with corresponding monitoring systems; (vi) conduct educational and public participation activities; and (vii) elaboration of common agreed actions in the La Plata Basin, integrating the National Action Programs against Desertification.

*Results***:** 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. A project designed for the ecosystem of the Selva Misionera Paranaense

region, including experiences and best practices drawn from the priority project and other GEF projects (Bermejo, Gran Chaco, and Upper Paraguay.) Commonly agreed upon actions in the La Plata Basin, complementing the National Action Programs against Desertification.

Identified responsible institutions: 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.

Financing. The Subcomponent II.5 will be executed throughout the five years of the project. Total US $ 1,032,000 (GEF, US $ 450,000; counterpart, US $ 582,000).

Subcomponent II.6 Sustainable Development Opportunities. The objective is the development of sustainable practices for the management of common issues in two or more LPB countries, through coordination of activities with shared objectives. This Element concentrates on the identification and preparation of projects in two areas actively undergoing development and having opportunities for the mobilization of financing for inclusion of sustainable development principles in the following two activity areas: (1) projects that promote clean technologies and the capture of greenhouse effect gases that mitigate the climate change 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.

Results: Formulated projects promoting clean technologies and practices that capture greenhouse effect gases to mitigate climate change, and recreational development and ecotourism projects to be implemented in the Lower Uruguay River.

Identified Responsible institutions: Country Environment Ministries, social and production organizations, Ministries of tourism and marine transportation, international tourism agencies and civil organizations.

Financing. The Subcomponent II.6 will be executed throughout the five years of the project. Total US $ 571,800 (GEF, US $ 250,000; counterpart, US $ 321,800).

Subcomponent II.7: Pilot Demonstration Projects and scaling up strategy. The objective of the pilot demonstrations is to provide local management experience, test the feasibility of the proposed measures, and determine the actual costs of specific interventions hence are in some form equivalent to pseudo “feasibility” projects. They are focused on the resolution of critical problems, in selected areas and sub-basins. They will be carried out by local committees with the participation of key governmental and non-governmental organizations. These projects have the financial support of multilateral regional banks and mechanisms–FONPLATA and CAF, with a significant investment at

the local scale. Four pilot demonstration projects are proposed. The outcomes of this subcomponent will develop, document and disseminate feasible and cost-effective land and water management measures to address priority transboundary concerns within the La Plata Basin, and provide the basis for sustainable use of the land, water and biological resources in the LPB as input for the SAP formulation including for its adaptation measures plan.

Element II.7.1 Pilot demonstration for the **Biodiversity Conservation in the Regulated Parana River.** The experience to be gained will contribute to the strengthening of integrated water resources management capacity in the Parana River basin, at the confluence of the Parana and Paraguay Rivers and Saltos del Guayrá, where two of the most important transboundary dams are located: Itaipu and Yacyretá. This project engages Argentina, Brazil and Paraguay and will complement the on-going efforts of Itaipu Binational. A management plan to preserve aquatic resources will be developed. A documented 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.

Element II.7.2 Pilot demonstration for a **Hydrological Alert System at the confluence of the Paraguay and Parana Rivers.** A monitoring and alert system for risk 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. This project involves Argentina, Paraguay and Brazil.

Element II.7.3 Pilot demonstration to **Resolve Water Use Conflicts in the Río Cuareim/Quarai Basin**. This project engages Brazil and Uruguay. The proposal is to generate local experience to improve integrated water resources management capacities in this basin, seeking to harmonize use at the national and transboundary levels. 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. This project informs critical transboundary issues by developing knowledge on water use conflicts and the impacts of irrigated land.

Element II.7.4 Pilot demonstration to **Erosion Control in the Pilcomayo River. This project engages** Bolivia/Argentina/Paraguay. The purpose is to generate local management experience in reducing mining contamination and soil erosion, and sedimentation and river system in the Pilcomayo River. It includes a group of actions at the local level (Cuenca de Cotagaita in Bolivia) to preserve the integrity of the water

resources system of the Pilcomayo River basin, improving water quality and erosion control, and replicate the experience. The project will contribute to improved 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.

Identified responsible institutions: The direct coordination and supervision will be carried out by local experts in each country under the direct supervision of the Project Technical Coordinator. Technical Advisors will be contracted for specific tasks including technical report preparation, conduct of meetings, dissemination of press releases and support to public participation.

Financing. The Subcomponent II.7 will be executed throughout the five years of the project. Total US $ 4,564,076 (GEF, US $ 872,000; counterpart, US $ 2,072,076; co-financing, US $ 1,620,000).

***Total financing*.** Component II will be executed throughout the 5-year project period. Total financing is US $21,867,107 (GEF, US $ 5,252,300; government counterpart, US $ 6,616,807; other co-financing US $2,498,000, other counterparts US $ 7,500,000).

Component III: Hydro-climatic Models and Scenarios for Adaptation

Overall Objective: Component III is composed of one Subcomponent, which focuses on foundational activities required to support adaptation to climate change and variability within the La Plata Basin. The objective of this Component will be to develop capacity for integrated water resources management including enhanced capacity for adapting to climate variability (related to El Nino/La Nina periodicities) and climate change, as recommended in the Second National Communications of Paraguay, Argentina and Brazil.[18]

Subcomponent III.1 LPB-wide climate scenarios. This Subcomponent is a "foundational" activity pursuant to the UNFCCC and will increase knowledge, and technical and operational capacity within the five countries of the La Plata Basin to predict more accurately the hydrological effects of climate variability and change, particularly to mitigate flood and drought disasters and to help adapt current and future sustainable development activities to future climate and hydrological regimes, as set forth in the National Communications of the five LPB countries and in the Second National Communications of Argentina and Brazil. As set forth in the applicable

[18] 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 Brazil 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).

National Communications and Second National Communications prepared pursuant to the UNFCCC, this Component will:

(i) develop and apply climate-based hydrological models integrated at the LPB level;
(ii) develop and adapt regional climate models to the La Plata Basin;
(iii) develop sub-regional projections of climate scenarios and their associated hydrological responses, directly related to adaptation to climate variability and change;
(iv) utilize soil coverage classifications prepared using remote sensing and data systematization for modelling of soils, vegetation and aerosols (aerosol and vegetation biophysical parameters) necessary as inputs to regional hydrological and climate models;
(v) assess vulnerability, identifying flooding zones and hydrologic risks on an agreed map base;
(vi) assess potential impacts of climate change on hydroelectric power generation and development, and evaluate urban and rural vulnerability and agricultural impacts; and
(vii) generate adaptation strategies to climate change for agriculture, hydro-power generation, water supply, and urban development (with regard to flood control).

In addition, within the context of a multi-purpose dam operation strategy, and consistent with the applicable National Communications and Second National Communications prepared by the LPB countries pursuant to the UNFCCC, this Component will:

(i) facilitate operation of an atmospheric and micrometeorological observation system;
(ii) develop a climate database with free public access;
(iii) prepare a data management and remote sensing data assimilation plan for use in forecasting systems;
(iv) prepare an atmospheric monitoring system in a pilot zone, involving weather and climate forecasts with field measurements at a pilot scale for appropriate adjustments to the regional climate models;
(v) optimize short term forecasting systems associated with currently available national alert systems, with the construction of an operational rainfall estimation system for the basin, compatible with, complementary to and enhancing already existing alert systems;
(vi) implement long term forecasting systems within the existing forecasting systems by sub-basin;
(vii) elaborate and implement contingency plans for transboundary risk management through a technical cooperation network; and
(viii) involve the LPB stakeholders at all time thereby ensuring awareness and informed decision making capacity in adapting to climate change and variability.

Results: The Integrated Hydro meteorological-climatic Forecasting System at the LPB level developed through this component will generate meteorological, hydrological and climatic forecasts and scenarios that will contribute to enhanced capacity within the LPB to anticipate floods, droughts, and extreme events (related to El Nino and La Nina periodicities), inform regional land use and economic development programs, and permit the LPB countries to anticipate and adapt to climate change and variability related impacts. In addition to a long-term model-based forecasting and evaluation system, this Component will also coordinate the formulation of a climate change vulnerability assessment and will facilitate the pilot scale application of monitoring and response systems, including associated alert systems and data dissemination systems. This Component will promote multi-stakeholder participation throughout its activities, as outlined in Component I above. As a result, the basin and its stakeholders will be scientifically well equipped and will have a better understanding of the adaptation needs and required structured responses to enable society at all levels to better adapt to the anticipated climate change. Thereby the outcome will inform the formulation of the basin- wide TDA and SAP including a menu of adaptation measures.

Identified responsible institutions: This Component will be executed by the National Project Units, National Meteorological Units (SMN, CPTEC/INPE/MMA, INEMET/MAPA, SENAMHI), Defense Ministries, and Organizations responsible for hydro-climatic 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.

Financing. Total financing for Component III US $ 16,319,150 (GEF, US $900,000; counterpart, US $ 5,800,900; co-financing, US $ 9,618,250).

Component IV: Transboundary Diagnostic Analysis (TDA) and Strategic Action Program (SAP) Formulations

Overall objective. A Strategic Action Program (SAP) for the La Plata Basin, technically sound and agreed, 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 Work elements: (i) TDA Preparation, including additional specific studies on priority issues not included in previous components and SAP Preparation base on the compilation and analysis of the technical and scientific elements of the activities executed in the Project

Subcomponent IV.1 Hydro-climatic assessment for TDA. The objective is the 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 special complementary studies and result of the different component of the project . The TDA will encompass the results of the

forecasting modelling and scenarios as well as the results of the climate change vulnerability assessment.

Subcomponent IV.2 SAP Formulation. The objective is the SAP design base on conclusion a 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 LPB, which will provide more accurate information on the local management of and solutions to the main problems facing the LPB. 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 grant 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. The outcomes is the Strategy (SAP) for the sustainable utilization of the LPB's land and water resources , considering the vulnerability to climate variability and change, including a financing plan for the implementation of the proposed actions, with identification of partners, donors and investors

Results: The outcome will be a strategy (SAP) for the sustainable utilization of the LPB's land and water resources including a financing plan for the implementation of the proposed actions, with identification of partners, donors and investors. The SAP including a climate adaptation component or 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.

Identified responsible institutions: The execution of Subcomponent IV will be performed by National Executing Organizations with the support of the PCU, and in cooperation with the National Project Units.

Financing: This Component will be carried out during the last four years of the project. Total component financing US$ 4,931,324 (GEF, US $ 1,292,824; counterpart, US $ 2,038,000; co-financing, US $ 600,500, other counterparts US $1,000,000).

Project Management

Project management. The La Plata Basin is comprised of five countries and extends over approximately one-fifth of the South American continent. The proposed work program includes activities to be carried out by an even larger number of agencies, organizations, and partners, representing the many and diverse stakeholders within this large basin. Consequently, there is a need for different layers of coordination responsibilities.

Coordination of project activities. A Project Coordination Unit - PCU in charge of overall project coordination and management issues, will be housed by the CIC. National activities will be executed under the coordination of each NPU, acting as, *inter alia*, inter-ministerial committees to coordinate sectoral interests within their national territories, whereas the overall coordination and execution of specific LPB-wide activities will be under the CIC. The CIC will be charged with the development and implementation of a Decision Support System (DSS) for the Integrated Management of the Water Resources in the La Plata Basin, which includes the Digital Base Map for the Basin. The DSS will be supported by the hydro-climate forecasting system to be developed under Component III. In addition, it will support the assessment and monitoring of water quality, and the Plan of Communication to be implemented under Subcomponent I.2. The arrangements for the execution of the project are described in detail in Section 5 below.

As per the GEF requirements and as outlined in the M&E plan, the project under the coordination of the PCU will prepare at least three experience notes codifying good practices emanating from the project. In addition, lessons learned will be disseminated through the IW:LEARN network, to which the project website will continue to be linked, and through participation in the biennial knowledge and information sharing efforts convened by the GEF.

Financing: Project Management will be carried out during the entire five years of the project. The costs for project management are disbursed through the project sub-components. A cumulative ***Project Management Total is*** US$ 12,307,700 (GEF, US $ 571,200; co-financing, US $ 11,736,500).

***Total project financing*:** The total project financing during the five years of project implementation is US$ **61,764,167** (GEF, US $ **10,730,080**; government counterpart, US $ **17,943,837**; co-financing, US $ **8,500,000**, other counterparts US $ **24,590,250**).

4. Risks, Sustainability and Replicability

Cooperation risk. The SAP presents an opportunity to integrate diverse development parameters, into a sustainable water resources management program. However, the existing diverse, heterogeneous nature of the legal jurisdictions in the five countries as they pertain to water resources and climate, unto themselves, define risk. Politically, from the national level, to the provincial or state levels, failures to adopt, implement and/or cooperate on the SAP recommendations may negate any efforts initiate by this GEF projects. As such, to minimize this risk, the project is designed to involve the appropriate governmental and non-governmental stakeholders, and develop inter-ministerial coordinating mechanisms to address sectoral concerns within the framework of IWRM in the LPB. - MODERATE

Unilateral risk. Despite the riparian governments and the CIC's strong support and interest for this project, the geographic expand of the basin and the multi-sectoral and multi-institutional characteristics require focused coordination. Strong linkages with civil society, professional bodies, and relevant governmental bodies will minimize this risk. The upstream-downstream orientation of the basin countries could potentially introduce risks with interest in unilateral actions when national interests of a specific country are concerned. Incentives for cooperation and legislation harmonization, and introducing mechanisms for coordinated actions provide incentives for stakeholders to minimize the identified risks. - MODERATE

Fiscal 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. - LOW

Implementation risk. The level of risk associated with project implementation 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 project. - LOW

Geographic-context risk. The SAP presents an opportunity to integrate diverse development variables, including legislation to provide a harmonized legal framework among the countries, to give a solid base for the program sustainability. The diverse, heterogeneous and different jurisdictions involved in the five countries, as regards 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 LPB, there is a further risk that the failure of the provincial or state governments to adopt and implement the SAP may negate the actions of the federal authorities in certain areas of activity where the provincial or state governments have constitutional jurisdiction. Failure of the countries—and their administrative units where applicable—to approve the

proposal would not allow the project to go forward; however, the strong commitment of the LPB 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 LPB, which is a limitation to effective and efficient participation and the active involvement of the stakeholders in the Project execution. The extent of the LPB 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 LPB 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. – MODERATE

Climate change risk. The intrinsic characteristics of the LPB, together with changes in precipitation have significant implications on discharge, making water-related activities highly vulnerable to climate change. The basin issues are indeed complex and demand an integrated approach to address them. By creating the Basin-wide capacity to mitigate the negative effects of climate change and climate variability in the basin, this project is meant to reduce risk associated with regional scale hydrological events through increased understanding of climatic influences in the LPB, and subsequently, increased sustainable transboundary management of surface and groundwater basin water resources. This project will ensure that national efforts are coordinated into a basin-wide forecasting system and vulnerability assessment for informed basin-wide alternative solutions to build resilience to the effects of adverse climate change and variability. This joint effort allows for scientific and technical cooperation between countries with asymmetric capabilities. Considering the current level of scientific efforts and technical research in most riparian countries, working at the basin level is of low risk - LOW

Sustainability: The Program has been conceived to be implemented over 15 years, in three successive 5-year stages. The baseline remains weak in the face of the problems related to the dimensions of the LPB, and this needs to be resolved. GEF support and other cooperation catalyzed toward the resolution of these concerns within the LPB 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 Framework Program. 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 execution 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 LPB, 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 LPB 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, student inter-institutional knowledge exchanges, assistances (horizontal cooperation), and a "Basin spirit" within the participating institutions because 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 Framework Program and its activities are key elements for the social sustainability.

***Replicability*.** Each pilot demonstration requires preparation of a replicability plan. In addition, **t**he outcome from 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 LPB.

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 LPB. 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 LPB 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.

5. Project Implementation Arrangements

UNEP, as the GEF Implementing Agency (IA), 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 Division of GEF Coordination (UNEP/DGEF) will monitor implementation of the activities undertaken during the execution of the project and will provide technical and administrative oversight. It will be responsible for clearance and transmission of financial and progress reports to the GEF. UNEP retains responsibility for review and approval of the substantive and technical reports produced in accordance with the schedule of work.

GS/OAS, due to its historic involvement in the basin and 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**.**

CIC is according to the La Plata Basin Treaty, the organization designated to coordinate the implementation of basin-wide programs. This project will ensure that its regional coordination mandate is strengthened. During the SAP formulation phase, CIC will thus be specifically charged with the development and implementation of a Decision Support System (DSS) for the Integrated Management of the Water Resources in the La Plata Basin, which includes the Digital Base Map for the Basin. CIC will also be charged with the implementation of activities in Component I related to legal issues and the institutional strengthening of the CIC.

The **Project Coordinating Unit** (PCU), hosted at the CIC, will, in close consultation with the CIC, 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 budgeted 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. In this context, the PCU will ensure adequate coordination with on-going GEF initiatives in the region to ensure relevant synergies.

The **local execution** of the project in each of the LPB countries will be done by national institutions under the coordination of the **National Project Units (**NPUs). A national technical representative who will serve as National Coordinator for the project will lead the NPUs. 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** will be 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. They will continue to meet as required and will be coordinated by the NPUs.

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:

- CIC Political and Technical Representatives from each of the five riparian countries.
- An additional national technical officer to cover the various thematic issues of the project. Representation of the national environmental institutions will be secured through one of the two technical representatives;
- A representative of UNEP, acting on behalf of the GEF Implementing Agency;
- A representative of the DSD/OAS, acting on behalf of the Executing Agency;
- A representative from the major co-financing institutions might be invited to participate as deemed necessary.
- Representatives of other on-going GEF projects in the basin could be invited on a case by case basis and as the need arises.

The Secretary General of the CIC 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 budgeted work plan for validation by the SC. As the need arises, on-going GEF initiatives in the region will be invited to participate in project coordination meetings.

6. Relationship with other Projects (GEF and others)

An OAS-led study of the La Plata Basin in the 1970s and again in the 1980s identified potential opportunities and limitations for economic and social development. It noted the LPB's great hydroelectric potential and the strategic importance of using the tributaries of the LPB for navigation. Critical areas were identified, such as the Pilcomayo River and the Bermejo River basins, with great soil erosion rates and sedimentation concerns, and the Pilcomayo River, with serious environmental impacts due to mining activities, and recognized as "hot spots." The hydrological analysis of the LPB showed the importance of the Pantanal both in terms of its hydrological role and in terms of biodiversity value.

It is thus no coincidence that the first GEF-IW projects in the region were informed by the OAS studies. However, although these projects were in many aspects very successful, they lacked of a coordination framework. The Plata project provides the linkages and context for these ongoing and previous efforts. The active GEF funded projects in the LPB are:

- *Strategic Action Plan for the Bermejo River (SAP-Bermejo).* **UNEP/GEF – OAS** 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. Total Cost: US $ 25,726,000 (GEF US $ 11M).
- *Implementation of Integrated Management Practices for the Water Resources of the Pantanal/Alto Paraguay.* **UNEP/GEF – OAS** 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. Total Cost: US $ 16,403,000 (GEF US $ 6,615,000).
- *Environmental Protection of the La Plata River and its Maritime Front, to prevent and control contamination and habitat restoration - FREPLATA.* **UNDP/GEF** The La Plata River and its maritime front, shared by Argentina and Uruguay, have an enormous biological diversity. This is the rationale for a GEF project designed to improve knowledge and protect this important ecosystem. Total Cost: US $ 8,119,036 (GEF US $ 5,682,290). This project will continue to entertain close working relationship with the new FREPLATA project phase II under approval ensuring beyond cooperation on technical fronts that *inter alia* the estuary commissions CARP and CTMFM (Comision del Rio de la Plata and Comision Tecnica Mixta del Frente Martítimo) are adequately connected to the Plata Commission – CIC, and that information sharing and monitoring functions are optimised.

- *Environmental Protection and Sustainable Development of the Guarani Aquifer System.* **WB/GEF – OAS** 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. Total Cost: US $ 26,760,000 (GEF US $ 13,400,000). – Closing
- *Sustainable Land Management in the Transboundary Ecosystem of the Gran Chaco Americano.* **UNEP-UNDP/GEF** 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. Total Cost: US $ 14,000,000 (GEF US $ 6,000,000).

In addition to those mentioned above, other projects, such as for example the EU funded Master Plan for the Pilcomayo River basin, are also being executed, all without an integrated framework to ensure coherent efforts and an efficient use of human resources and financing applied. Hence the proposed Plata initiative will look into coordinating all existing efforts under a consolidated management framework and the leadership of the CIC.

7. Project financing and incremental costs

The total budget of the Project is US $ 61,764,167 with the GEF grant amounting to US $ 10,730,000 and co-financing amounting to US $51,034,087. Detailed financing information per component is presented in the Project Document Annex 2 Budget Summary Table, also available in Excel format the details of project financing in terms of GEF, co-financing and the GEF financing for each subcomponent.

The total government counterpart is US $ 24,002,837 corresponding to in-kind contributions from: Argentina US$ 7,370,226, Bolivia US$ 3,888,868, Brazil US$ 6,320,731; Paraguay US$ 4,491,756, and US$ Uruguay 1,931,257. The major change in project financing is attributed to a reduction in the original funding at the request of GEF. With reduced funding from GEF, there was a subsequent reduction in the government counterpart's contribution (from US$ 25,271,077 to US$ 24,032,837). In terms of other co-financing sources, during the project preparation period, the contributions both decreased and increase with a positive gain of US$ 602,694 in co-financing contributions. The changes from original to current co-financing funding status are identified in Table 2.

With respect to incremental costs, the scope of the **baseline conditions** are spatially set by the natural limits of the basin, and thematically, the project components and outcomes create the framework for defining the parameters of the baseline. The current baseline conditions for water resources management, in the LPB, fundamentally consist of either a) individual national economic development programs, such as water supply and sanitation and/or transportation, which are the responsibilities of various levels of government and primarily focus on individual country needs; b) bi-national or tri-national investments for hydropower generation; and/or c) other environmental

management activities that are coordinated by CIC, but executed by government and/or private agencies. The latter activity includes ongoing environmental monitoring programs, informational programs, and related activities at the national and local levels. Moreover, through these investments, the riparian governments, together with the respective private sector, are indirectly investing in institutional capacity within the sub-basins of the LPB. Generally, various multi-national committees implement a country's individual program and/or investments in specific sub-basin funded through FONPLATA, the financing facility created under the LPB Treaty to support the activities. The total for the baseline conditions in the basin is estimated at US$ 126.1 million. FONPLATA financed activities that are considered to be part of the baseline conditions, and detailed in the incremental cost analysis in Annex 4 of the Project Document. In addition, currently there are a number of active GEF co-financed projects taking place in the LPB. The GEF funded projects total US$ 91.1m (GEF U$ 45.5m) are detailed in Annex 4.

The project-related baseline conditions for this GEF project are estimated at US$ 213.5 million, as set forth in the Project Document's Annex 4 Table 1, the Incremental Cost Matrix.

In terms of ***GEF alternative scenario***, studies and analyzes, conducted to formulate the baseline framework for the TDA, the basis for the project design for this GEF project identified several existing activities, and included in baseline conditions, which begin to deal with some of the problems being addressed by this project. Some of these activities, already supported by the GEF, extend transboundary benefits to only small portions of the LPB. Thus, these baseline projects are insufficient to achieve the broader development goals for the LPB. The alternative scenario includes investments during the five years of implementation, which require resources sought from the GEF, as well as additional investments from national counterparts' donor institutions and private sector to implement actions to coordinate on-going and programmed actions and investments in the LPB for the sustainable management of its water resources. The alternative scenario includes enabling actions for adaptation to climate variability and change. The governments of the LPB are committed to making these financial contributions, and this commitment extends across all governmental levels, (federal, national, state, provincial, departmental, and municipal). With existing baseline activities, GEF financing and additional co-financing, the alternative under this scenario is estimated at about US$ 275.5 million. The incremental cost, by which the alternative scenario exceeds the costs of the baseline situation, is estimated at about US$ 61.9 million, or 22.5% in which the GEF contribution is 4% to the alternative scenario. In addition, but not included in the incremental cost analysis, US$ 25,000 and US$ 700,000 PDF Block A and Block B grants, respectively, already disbursed.

8. Monitoring, Evaluation and Dissemination

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 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 have been disbursed and all activities completed. The Project Document's Annex 3, the Monitoring and Evaluation Plan, details the M&E, identifies project and IW (process, stress reduction and status) indicators, and respective responsibilities and the M&E time schedule.

In addition to Project Monitoring and Evaluation activities, the project will include activities aimed at assessing the effectiveness of the Framework Program implementation in achieving its goal. The purpose of this assessment is to identify corrective measures and/or changes in the Framework Program 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, supported in a M&E system based on the Results Framework (Project Document Annex 1). 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 above (see also Annex D), together with the activities undertaken under the "Public Participation Fund."

In terms of financing the M & E process, the total cost for M&E is US$1,012,500.00 (GEF US$714,500.00, US$298,000.00 counterpart from the governments); of the US$714,500.00 of GEF contribution to the M&E Plan, US$370.00 is allocated under Component I, within the Technical Coordination and Administration activity, of the

project. An additional US$244,500.00 is allocated under the specific M&E Plans of the Pilot Demonstrations (US$200,000), and Priority Activities and Studies (US$44,500). The remaining US$100,000 corresponds to the MTR and FE, and the meetings of the Inter-ministry Committee, allocated under this Work Element I.3.2 as follows with a total US $ 398,000. (GEF, US $ 100,000; counterpart, US $ 298,000). The subcomponent will be executed during the five years of the program.

9. Additional Comment

Additional information on each of the proposed activities can be found on the web as follows.

www.cicplata.org -> Programas y Proyectos -> Programa Marco -> PDF-B

Table 2 Schematic of LPB Project Implementation Schedule

COMPONENT/ ACTIVITY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Component I					
Integrated Water Resources Management					
Technical Institutional and Capacity Building					
Harmonization of Conceptual, Legal and Institutional frameworks					
Stakeholder Participation					
Communication and Promotion to the Public Participation					
Education for Responsible and Conscious Public Participation					
Public Participation Promotional Fund (PPPF)					
Coordination of Project Activities					
Technical Coordination					
Decision Support System					
Administration – OAS/DSD					
Monitoring and Evaluation					
Component II					
Integrated Water Resources Management					
Integrated Water Balance					
Water Quality Assessment and Monitoring					
Integrated Management of Groundwater: SAYTT					
Biodiversity Management					
Control of Land degradation					
Identification of Sustainable Development opportunities					

Table 2 Schematic of LPB Project Implementation Schedule

COMPONENT/ ACTIVITY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Pilot Demonstration Projects					
Biodiversity (Parana River)					
Forecasting System (Paraguay-Paraná)					
Use Conflict (Cuareim-Quaraí)					
Mining Contamination (Pilcomayo)					
Component III					
H hydro-climatic forecasting system for the Basin					
Development and use of regional climate scenarios					
Vulnerability assessment and adaptation measurement					
Component IV					
TDA & SAP Formulation					
Complementary studies and TDA Consolidation					
SAP Preparation					

Table 2 Schematic of LPB Project Implementation Schedule

COMPONENT/ ACTIVITY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5

 Indicates development of the activity

 Indicates maintenance or update

Table 2 Co- financing sources, differences, and status

Name of co- financier	Type	Original Amount (US$)	Current Amount (US$)	Difference (US$)	Status
Countries					
Argentina	In-kind	7,756,270	7,370,226	-386,044	Confirmed in endorsement letter
Bolivia	In-kind	4,095,542	3,888,868	185,370	Confirmed in endorsement letter
Brazil	In-kind	6,652,702	6,320,731	-511,341	Confirmed in endorsement letter
Paraguay	In-kind	4,729,493	4,491,756	279,604	Confirmed in endorsement letter
Uruguay	In-kind	2,037,070	1,931,257	-379,417	Confirmed in endorsement letter
Total Government in kind co-financing		**25,271,077**	24,002,837	**(-1,268,240)**	Changes in project component activities
OTHER					
CPTEC / INPE/MMA Brazilian Research Center finances III Adaptation to climate change	In-kind	6,400,000	6,400,000	0	Confirmed
CLARIS Europe-South America Network for Climate Change - Assessment and Impact Studies finances III Adaptation to climate change	In-kind	650,000	0	(-650,000)	Activity finalized
ITAIPU BINATIONAL "Programma Cultivando Agua Boa" finances II.4 Integrated Water Resources Management- Water Related Biodiversity	Co-financing	7,500,000	7,500,000	0	Confirmed
ITAIPU BINATIONAL [19] support II.4.3 ; II.2.; I.1.3 and II.7.2	Co-financing	1,240,000	1,240,000	0	Confirmed
UNESCO ISARM Américas support II.3 – Integrated Management of Groundwater	In-kind	28,000	28,000	0	Confirmed
UNESCO – IHP support II.1 –Integrated	In-kind	250,000	250,000	0	Confirmed

[19] ITAIPU BINATIONAL US$1.240.000 for: US$ 600,000 co-financing Activity II.4.3 Design of an harmonized basin-wide regional strategy for water related biodiversity management; US$ 200.000 for Work Element II.2 Water Quality and Contamination; US$ 90,000 for Work Element I.1.3. Decision Support System; and US$ 350,000 for II.7.2 Aquatic biodiversity Pilot Project

Name of co- financier	Type	Original Amount (US$)	Current Amount (US$)	Difference (US$)	Status
Water Balance					
PILCOMAYO European Union Cooperation finances II.2 –Water Quality and Contamination (EU$417,823)	In-kind/co-financing	600,000	600,000	0	Confirmed
CARU finances II.2 – Water Quality and Contamination[20]	In-kind/co-financing	200,000	0	(-200,000)	Activity remains but, to date letter for co-financing not received
JICA/SEAM-SENASA finances II.2 – Water Quality and Contamination	In-kind/co-financing	200,000	0	(-200,000)	Activity Finalized
FONPLATA finances II.7 – Pilot Demonstration Projects		1,200,000	0	(- 1,201,000)	Within CIC commitment letter
CAF finances II.7 – Pilot Demonstration Projects	Co-financing	0	70,000	+ 70,000	Agreed to funding
OAS finances I – Strengthen Basin Wide Cooperation Capacity	In-kind	225,000	225,000	0	Confirmed
Technical Office of Pilcomayo and Bermejo Rivers – Bolivia finances II.3.2. SAYTT priority project)	In-kind/co-financing	300,000	300,000	0	Confirmed
PROSUR IAI CRN-055 "Program for the study of regional climate variability: prediction and impacts in the MERCOSUR area" finances III Adaptation to climate change	In-kind	155,650	155,650	0	Confirmed
GEWEX / CLIVAR LPB experiment (LPB) finances III Adaptation to climate change	In-kind	3,000,000	3,000,000	0	Confirmed
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 modelling system. finances III adaptation to climate change	In-kind	100,000	100,000	0	Confirmed
National Agency for Scientific and Technological Promotion - Argentina (07-12402)	In-kind	120,000	120,000	0	Confirmed

[20] Cost of water-quality sampling campaigns for the next five years.

Name of co- financier	Type	Original Amount (US$)	Current Amount (US$)	Difference (US$)	Status
Climatic trends and scenarios in Argentina. finances III Adaptation to climate change					
National Agency for Scientific and Technological Promotion-Argentina (07-14420) "Scientific and technological bases for the study and forecast of meso-scale precipitating systems over Argentina. Support for a flood alert system" finances III Adaptation to climate change	In-kind	140,000	140,000	0	Confirmed
CIMA - UBA Climate variability in different temporal scales over South America. finances III Adaptation to climate change	In-kind	15,000	0	(-15,000)	Finalized
UBACYT-UBA Distribution of extreme precipitations in a context of dynamic climate. finances III. Adaptation to climate change	In-kind	15,000	0	(-15,000)	Finalized
LPB Project –CLIVAR-EU/INCO finances III Adaptation to climate change	Co-financing (EU$3,359.000),	4,702,600	4,702,600	+ 4,702,600	New and Confirmed
Comibol finances II.7 Pilot Project Pilcomayo River	In-kind	340,666	0	(-340,666)	Included in country counterpart
Pilcomayo finances II.7 Pilot Project Pilcomayo River	In-kind	211,000	0	(-211,000)	Included in country counterpart
Waterway's Intergovernmental Committee (CIH) finances IV TDA-SAP preparation	In-kind/co-financing	1,000,000	1,000,000	0	CAF Technical Cooperation to CIH, finalized. Information available for the TDA/SAP
Sub-total of other co-financing		**25,160,316**	**27,031,250**	**+1,870,934**	
Grand total co-financing		**50,431,393**	**51,034,087**	**+602,694**	