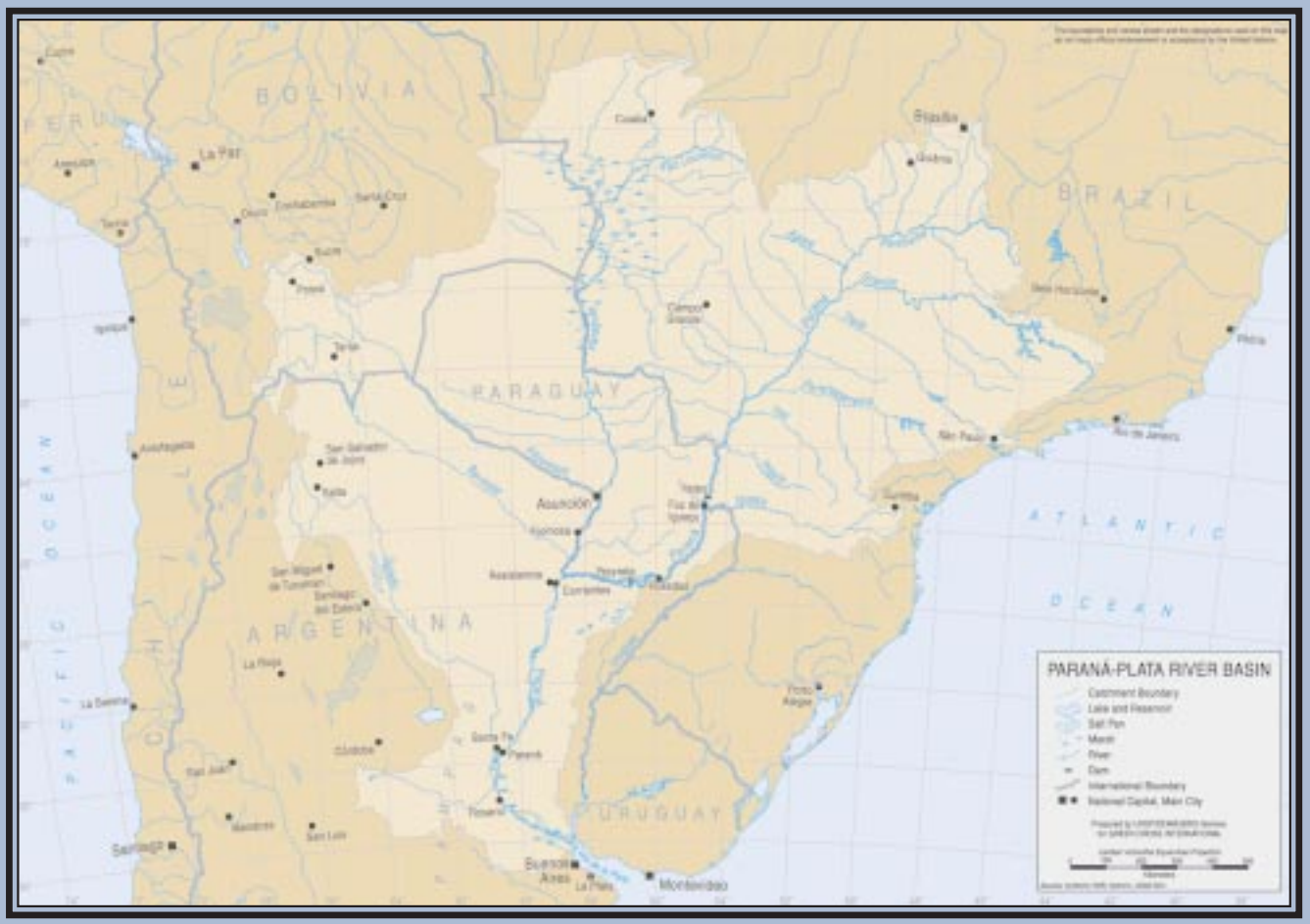
The La Plata River Basin [7]

The aim of this project is to apply a systematic and integrated approach to water management in a vast basin which has been relentlessly exploited for the past several decades for a single major asset - energy production, and which has never benefited from the multilateral cooperation of its five basin states. Harnessing the energy potential of the La Plata basin is credited with bringing the states of the region together, usually bilaterally for the purpose of particular hydropower projects, but it has also created conflicts and serious environmental and social problems which must also be resolved through cooperation. By adopting a territorial approach, this project intends to forge improved relationships not only between different layers of decision-making and the public within and across state borders, but also in order to reconcile the needs of human society and the natural environment. Activities will focus on identifying the causes of the water-related conflicts both latent and already apparent in the basin and conducting pilot investigations in one large sub-region and concerning five specific conflicting issues. The findings and recommendations of the pilot projects will be translated into proposals for the transformation of water management strategies across the basin, particularly regarding the management of existing, and the evaluation and construction of new, large interstate hydropower projects.

[7] *This project proposal was prepared by Green Cross Argentina, with the consultation of experts at the University of Buenos Aires, and in other basin states. Green Cross Argentina has been active in integrated water management projects for several years, most notably regarding the environmental and social effects of the Yacyreta Dam. GC Argentina will be the manager of the La Plata basin sub-project, with the close collaboration of Green Cross offices in Bolivia and Brazil and other institutes and organisations in the basin.*



Basin States and % territory of total basin: Brazil (46.08%), Argentina (27.57%), Paraguay (13.49%), Bolivia (9.11%), Uruguay (3.76%).
Basin Area: 2,966,900 km²
Basin population: over 113 million
Major infrastructure: The Yacyreta Dam (Argentina-Paraguay), the Itaipu Dam (Brazil-Paraguay) and the Corpus Dam (planned).

Background

The La Plata Basin is the fifth largest in the world and covers approximately 17% of the total continental surface of South America, including the south of Brazil, southeast Bolivia, Uruguay, Paraguay and the northeast of Argentina. The main rivers, the catchments of which form the basin, are the Parana, Tieté, Iguazu, Uruguay, Paraguay, Pilcomayo, Bermejo and Río de la Plata. The total territory of almost 3,000,000 km^2 contains a huge variety of natural resources and ecosystems. Several very large hydropower projects have already been constructed in the Basin and as many others are being planned. The Plata Basin constitutes a zone of great potential for the exploitation of natural resources, making interstate cooperation, transparency, environmental protection and the participation of all sectors of society in decision-making all the more necessary.

Climate has always been extremely important. The large area drained by the La Plata's hydrographic system extends from the subequatorial zone, through tropical zones, towards the temperate regions; precipitation varies widely from 3,000 mm a year in Carambú (Brazil) and Puerto Bertoni (Paraguay), to 2,000 mm a year in Orán (Argentina), to 840 or 763 in Río Cuarto (Argentina).

This territory is the most vital in the MERCOSUR region and the big cities of Buenos Aires and San Paulo are both located there. Because of this, human pressure on ecosystems, and especially on water as an energy source, is very strong. Over 70% of the combined GDP of the five basin states is produced in the basin, and 50% of the total population live there. The basin also boasts the most important wetland area in the world, the Pantanal, and the largest hydroelectric plant in the world, the Itaipu.

The relationships between Argentina, Brazil and Paraguay have steadily evolved towards increasing cooperation since 1979, when disputes over the use of the Rio de la Plata basin were first settled. The incentive for resolving these disputes was the common desire to harness the huge hydro-power potential of the basin, which resulted in bilateral agreements between Brazil and Paraguay, and Argentina and Paraguay for the creation of the Itaipu and Yacyreta dams, respectively. Cooperation over hydropower has been credited for encouraging the development of economic integration, cooperation over defence matters and agreements on ensuring that South America remains a nuclear free continent. However, these top-level agreements for the sake of national and regional development were made with little involvement or concern for the lives of the local people who would be effected, or the environment, and the Itaipu and Yacyreta projects have left a legacy of corruption and failure to compensate for environmental damage, or disrupted lives. Water management may have enhanced regional cooperation and stability at the state level, but the schemes have created new conflicts between effected peoples, governments and the authorities responsible for the dams. The benefits from these cooperative schemes have yet to be felt by many of the people who were most effected by them.

As more major hydropower projects are planned, to meet the growing financial and energy needs of the basin states, there is a unique opportunity to avoid repeating the mistakes of previous decades by approaching water resources management in a democratic and integrated manner.

Desciption of Problems and Issues

The main problem is the lack of a common strategy for all countries involved in the Basin management and control regarding multiple uses of water, developing the means to mobilize resources, and methods by which to occupy and organize space. Treaties have been signed, but they are not enough, and besides, they are not always adhered to. It is indispensable that greater cooperation between the States, and related basin-wide agreements and arrangements emerge. The same applies to all social actors. Un coordinated actions, based on local and sectorial interests have a negative impact on the Basin resources and generate accelerated environmental damage, which both adversely affect the potential of the basin to serve its population and could ignite conflicts between neighbouring countries in the future.

The magnitude of the basin, the different systems in place to organize the geographical space, and the competing uses of natural resources - especially water resources - present problems at different levels, including between the five states. The main problem is the lack of a common basin management strategy for the different countries, particularly regarding the compatibilization of energy exploitation and the coordination of actions aimed at controlling water pollution. Both issues have caused, on several occasions, international conflicts.

Although some countries have special national organizations to deal with the Plata Basin, these have proved to be ineffective in terms of specific actions. There are also multilateral and bilateral treaties and agreements between the countries in order to manage the major sub-basins, but, in general, the results have been the same and there are no clear and mutually respected inter-state policies. Even at the sub-national level, regions do not work efficiently together in the management of shared resources and spaces. Consequently, a basic problem is the lack of cooperation between the national States in order to arrive at the coordinated and integrated management of the Basin.

Territorial ordaining constitutes both a technique and a policy. It is an interdisciplinary technique that seeks to analyse relationships between society and the space it occupies. As a policy, territorial ordaining tends towards territorial planning, gathering techniques, and the analysis of tools, policies, strategies and plans for the service of society, aiming at ordaining the available resources in order to meet the desired objectives, and to attain a more harmonious relationship between society and the environment. The main antecedents regarding territorial ordaining as a policy can be found in Europe. France, with its "Amenagement du territoire", is a clear example. The European Union has produced the European Letter for Territorial Ordaining. This letter is the result of several documents, including Europa 2000+, and the European Territorial Strategy and Guidelines towards a European Territorial Policy.

This leads to a further problem; the various sectoral policies (lacking prevailing orientations and strategic reference frameworks) have negative impacts on the management of the basin's geographical space and on the sustainability and quality of the water resources. This creates difficulties in optimizing the different uses of hydric resources, most importantly impeding the obtaining of non-polluting energy. Finally, the "de facto" occupation of the territory, without a strategy on territorial uses and "ordaining" (see box), is causing accelerated environmental damage which greatly affect the hydric resources.

Characteristics of Conflicts

Several international conflicts have originated from the problems described above, specifically: incompatibility between major water works; important works which remain unfinished; and incompatibility between the different uses for hydric resources. Works are planned and built without a proper strategic framework for financing, protecting the environment or compensating and rehabilitating affected communities. International conflicts arise between energy production and navigation. The quality of the water is also seriously threatened by the uncontrolled expansion of urbanization; improper land use; localization of polluting activities and unsustainable infrastructure. Deterioration of natural environments has aggravated water risks, such as prolonged droughts and devastating floods, and threatens many of the unique natural ecosystems and features of the basin.

To sum-up, there are potential and actual conflicts arising from:

- Incompatibility between water exploitation works, especially those related to energy.
- Lack of efforts to make different projects in the basin compatible.
- Building of works and infrastructure projects without a strategic framework to contain or control them.
- Conflicts between energy production and river navigation.
- Exploitation of territories, their natural environments and resources, with severe problems of environmental deterioration, regarding the basin as well as regarding the quality of hydric resources, and the rise in conflicts created by water risks (swellings, floods, droughts, etc.).
- Among the main processes which cause conflicts at the national and international level are:
  - Uncontrolled urbanization and periurbanization processes. Anarchic development of human settlements and a pronounced increase in population and subsequent river pollution.
  - Uncoordinated dam construction.
  - Compulsive extension of vertical and horizontal farming and cattle frontiers.
  - Accelerated de-forestation.
  - Losses in biodiversity.
  - Migration and heavy demographic pressure on ecosystems.
  - Soil deterioration and erosion.
  - Increase in sedimentation in the Basin's watercourses and decrease in water flow speed within the river-beds.
  - Sudden changes in ground water levels.
  - Increase in frequency and duration of droughts.

This project aims to obtain an overall vision of the La Plata Basin, in order to focus later on selected pilot cases. These pilot cases will allow the populations and governments in the basin to identify and address problems and conflicts more effectively, as they will recommend specific actions in terms of cooperative management (planning, cooperation, agreement, coordination, etc.).

This is very important as most conflicts in this water rich basin are due to: management and institutional problems; lack of trust and, consequently, lack of agreeements between countries, states or provinces; and lack of communication and consideration between social actors. In order to overcome these many problems and conflicts, political will is required, and this is something never easy to achieve.

Project Foundations

The geographical space of the La Plata Basin constitutes, despite its large dimension, a unit within a bigger space, that of the MERCOSUR territory. Many studies have been done on the Plata Basin, especially regarding problems related to energy use and there is extensive documentation and analysis on the subject. However, none of these studies offers an overall view of the water problem as regards the occupation, organization and dynamics of the territorial system and the consequent internationalization of conflicts.

Consequently, it is imperative to have an integrated approach to the territory in the Basin and to apply this vision and the methodology ensued to a particular sub-region of the Basin (the selected region is the Upper Paraná), where three nations take part, which has been exposed to multiple uses and where water regulates the territorial system. Finally, five case studies will complete the vision of the interaction of different variables at the various selected levels.

Therefore, the proposal considers the following approach:

- Water should not be considered merely as a resource and even less as an economic asset. The current trend is to consider it as a physical medium (Moratilla, 2001) and a social asset.
- Water, considered as a physical medium, also becomes a strategic asset; there is an inseparable association between social development and the water culture.
- Efficient water management should be framed within a territorial development and ordaining strategy of the basin as a basis for sustainability.
- Consequently, it is necessary to consider different view-points which may associate and identify water uses with: urbanization processes; localization of productive activities; land uses and appropriations; infrastructure design and functioning; and the integrated management of natural ecosystems and their resources.
- Both the local and transnational dimension must be treated, both for the analysis of situations and the development of strategies.
- The territorial strategy offers the possibility to promote the integration of sectoral management measures for water resources with the objectives of protecting and preserving ecosystems and human welfare. Likewise, it is the reference framework used to coordinate between other sectoral policies (production, energy, transportation, urbanization, etc.) and the different levels of administration (national, regional, local); and, above all, to construct the framework for transnational integration.
- An integrated management of the resource should be inscribed within a general framework of territorial ordaining and development and should also be established as a means to avoid present and unforeseen international conflicts.

This approach, applied to the Plata Basin, indicates that efforts should be aimed towards two major points:

1. Water as a development factor, both as an energy source and as an asset for human development
2. Water as a risk trigger.

The concept of integrating actions should consider three levels.

1. Integrated and joint management of transnational basins.
2. Integrated and joint management for the different origins and uses of water.
3. Integrated and joint management with the participation of civil society and the different jurisdictions involved at national and sub-national levels.

The territorial capacity to sustain population and activities needs to be evaluated. Incorporating water management with a territorial ordaining strategy for the Plata Basin is a potentially highly beneficial initiative. It presents a new challenge and an innovation in management which, because of its many dimensions, requires the strengthening of cooperation between the basin's constituent states, regions and civil society.

Project Description and Justification

Principal Objective

The project's main objective is to achieve a systemic approach to problems and conflicts by identifying the causes, establishing the situation and practical recommendations tending to the solution of present and potential problems, promoting forms of cooperation, agreement, collaboration and coordination, within the framework of a territorial ordaining strategy, in accordance with international experience in other regions. Considering their wide regional and economic impact and conflict potential, priority will be given to the Binational hydropower exploitations projected for the region: Corpus (Upper Paraná), raising of the Yacyretá dam level (Upper Paraná); Garabí (Upper Uruguay) and Las Pavas; Arrazayal and Cambarí (Bermejo's Upper Basin) and Cierres North and South of the Middle Paraná.

Specific Objectives

- To identify hindrances and benefits (weaknesses and potentialities) for the improved management of the basin.

- To identify possible ways of improving management through pilot projects.
- To guide hydro-project developments in such a way that they will allow comprehension, perception and public and political awareness about integrated resources management. This should be done considering territorial ordaining aspects, anticipating and preventing inter-jurisdictional conflicts, especially international ones.
- To propose innovative ways of participation for society at all levels, in terms of analysis as well as in terms of management.
- To anticipate and prevent potential conflicts at the international level, as a result of unilateral actions or as a consequence of the dynamics of the "Society – Economy – Environment – Territory" system, with special emphasis on the management of shared hydro resources.
- To produce an objective study of the problems involved in the construction of projected dams in the Basin in order to foster coordination between authorities from the different countries, and preempt problems.

This objective will be applied at three levels: the Plata Basin, the Upper Paraná Axis and five cases with specific conflicts.

Expected Results

The realization of this project, its approach and methodology, will provide a global framework permitting the evaluation of projects in general, and hydropower projects in particular, related to the Basin's socioeconomic sustainable development. This study, added to the works which Green Cross has been doing in relation to certain specific cases linked to water resource management (especially in Yacyretá), will allow an interaction with the political authorities of the nations within the Basin in the search of management strategies based upon agreeement and cooperation, which will help to diminish the present problems and conflicts.

Activities and Actions

Activities and actions to be developed aim to attain a realistic view of the ruling principles which should be taken into account in the Basin development, and, from that, arrive at specific recommendations in the five pilot projects to be studied.

Project Implementation

The project will be implemented in three stages, partially superimposed in terms of time. The first stage will aim at obtaining a general view of the Plata Basin, starting from problems and conflicts. The second stage will approach the Upper Paraná Sub-region in the same manner, and in the third stage Pilot Projects will be developed. These were selected due to the existence of latent conflicts which require technical support in order to be resolved.

Project Justification

- There is a lack, within MERCOSUR in general and particularly within the Plata Basin, of a territorial ordaining and development strategy to guide processes in the search for a territorial re-balancing, greater economic and social cohesion and a balance between territorial competitiveness and environmental sustainability. Integrated water management must be an essential part of this strategy.
- The approach to river basin management, within a territorial ordaining strategy, is relevant to the project since it establishes an overall approach to interrelations between water, its possibilities as a vital resource and human activities in terms of territorial occupation and uses.
- In order to prevent new conflicts, to increase benefits and to reinforce cooperation among the Basin's member States, more effective participation of regions, provinces and municipalities, as well as more active citizens' participation and a permanent collective work between public Administration and the private sector are needed.
- The implementation of this project, with this approach and methodology, will permit a global reference framework for the future, from which it will be possible to analyze and evaluate different public and private projects and examine their impacts at different levels.
- The project is also justified as it promotes the idea and the awareness of the need and opportunity for joint management of the Basin's water resources and territorial ordaining in order to aspire to a sustainable development.
- This implies a total innovation in public policies, jointly agreed by the State members of the Plata Basin.

Reasons for selecting the Upper Paraná and Pilot Projects Sub-regions:

- The Upper *Paraná sub-region,* as well as the region which includes the pilot projects, have been selected to represent specific cases which show more clearly the problems and conflicts identified.
- Upper Paraná constitutes a trans-border fringe where the Paraná River articulates regional life. It is also subject to a strong pressure caused by several undertakings, among them the Yacyreta dam (one of the largest in the world), the effects of which are at present being amplified with new constructions over the outlet and the raising of the dam level. At the same time, another dam, Corpus, including a hydroelectric plant, will be built upstream from Posadas. To all this, there must be added the works corresponding to the Paraguay-Paraná hydroway, the foreseen ports (Santa Ana – Urugua-i) and existing undertakings such as Itaipú (Brazil) and Urugua-i (Argentina).

- Works linking new ports, highways and railways, as well as a re-ordaining for urban areas affected by the dam reservoir waters, should be underlined. All these will have a strong impact on the environment, with special emphasis on some protected areas such as the Iberá marshes and Iguazú National Park.

All of the above, briefly summarized, demonstrate the importance of the selected sub-region and its relationship with the territorial ordaining project.

Brief Description of Pilot Projects

a) It is important to evaluate the relevance of water as an energy generator, applied to *Yacyretá, Corpus and Garabí* exploitations and with regard to new possibilities such as the building of combined cycle utilities. The production of clean, non-polluting and renewable energy is confronted here with energy obtained from exhausted, polluting resources.
b) Certain *Bolivian mines* have caused pollution in the Pilcomayo River, due to the use of arsenic and heavy metals. This has caused great alarm downstream, where the river constitutes the international border between Argentina and Paraguay. Recently, certain corrections in the river's course have caused drought in some branches, with high fauna death toll, especially affecting the Yacaré Overo.
c) The horizontal and vertical extension of *farming and cattle ranching* in the north of Argentina's Pampean region has caused serious pollution problems in the river waters and in the Nappes, due to an excessive use of chemical fertilizers and pesticides.
d) In the *Upper Paraná*, the sub-region that will be primarily studied, serious problems have been detected, causing severe changes in water's physical and chemical properties. This has led to a loss in water quality, at the same time changing the fauna balance and affecting fish stocks. Main factors responsible seem to be human uses of the soil and the pressure on ecosystems.
e) The *Bermejo River* is shared by Argentina and Bolivia. It has a high energy potential in the upper basin, shared by both countries, and a potential for multiple uses involving irrigated land and the supply of drinking water to the middle and lower basin. Several polemical channeling projects already exist here. At the same time, the Bermejo drags sediments which contribute 70% to the filling of navigable routes in the Middle and Lower Paraná and affect the access channel to the Río de la Plata. There is a bi-national committee (Argentine-Bolivian) for regulation; in reality it is primarily dedicated to the hydropower exploitation of the upper basin where there are three undertakings (ARRAZAYAL; LAS PAVAS; and CAMBARÍ).

Green Cross's Role as an Actor in the Basin

Throughout the last years, Green Cross has taken part in several projects related to water management in the region. Of these projects, the most important ones are the intervention during the floods in Corrientes under the influence of the Niño stream, and a project developed since 1999 related to social and environmental problems generated in Yacyreta's bi-national (Argentina - Paraguay) dam zone of influence. Besides, for more than two years, Green Cross has been present in Uruguay and offices are being set up in Brazil and Bolivia and in Encarnación, Paraguay, as part of the Yacyretá project.

These circumstances, together with Green Cross International's acknowledged experience in the search of solutions for conflicts related to water use, show this is the idea time for this wider project to be realized. The above mentioned prior activities and the realization of the Water for Peace study now proposed will allow Green Cross to make a valuable contribution towards the seeking of political consensus between the Plata Basin states.

Measurable Results Expected from the Project

- The detection of present and possible international conflicts derived from inadequate management of the basin and hydropower infrastructure, and proposal of ways of solving them.
- Identify and characterize conflictive aspects within the basin, especially regarding sustainability of hydro resources. The importance of good water management in development sustainability and territorial ordaining will also be considered. Proposals regarding sustainable access to fresh water in the Basin will be provided
- Arrival at a more adequate knowledge and awareness at the basin level in the following tendencies:
  * Urbanization processes
  * Localization and re-conversion of productive spaces
  * Infrastructure systems and network development
  * Natural environments sustainability and resources and their influence on permanence and quality of the basin's hydro resources.
- To establish methodologies for the consideration of priority and compatibility criteria regarding water resources exploitation, particularly in relation to energy production.
- To propose actions involving participation of all agents involved, whether public (local, regional, national and community administrations) or private (social or economical agents, corporations, associations, universities, etc.).
- To make possible a joint and integrated management of the basin at transnational level, as a part of a wider territorial strategy for MERCUSUR

Project Activities

Three levels of activity can be distinguished:

a) OVERALL ANALYSIS OF THE BASIN ENVIRONMENT as a reference framework, which will be developed starting from specific subjects and prevailing issues.

b) REGIONAL ANALYSIS, which will include a transfrontier fringe dominated by the UPPER PARANA, between the cities of RESISTENCIA, CORRIENTES POSADAS and PUERTO IGUAZU. The methodology followed for the global analysis (REGIONAL PILOT PROJECT) will be applied in greater detail in this sub-region.

c) Specific pilot projects, which will attend to the prevention and/or resolution of conflicts: this will require in-depth analysis and a renewal of management mechanisms.

Main Activities

Activities will be organized around the following points:

1. Tendencies in water management within the basin.
2. Tendencies of change in city systems and urbanization processes: Spatial and social re-functionalizing.
3. Tendencies in productive systems: relationships between the productive system and the use and/or deterioration of the basin's hydro resources.
4. Tendencies in the transport and energy networks.
5. The problem of natural environments and their resources. Analysis of losses in natural environments due to expansion of productive processes, urbanization and peri-urbanisation, and lack of inter-state cooperation.
6. Water as a territorial organizer and development factor Water as risk trigger and phenomena that can cause social catastrophes.
7. Integrated analysis of the functioning of the territorial system, identifying problems and their degree of permanence and severity.
8. Identification of plans and projects within a strategic framework that will allow the project to recommend Ruling Guides for sustainable territorial development including integrated management of water resources.

The activities to be developed will be particularly applied to the Upper Parana trans-frontier space.

Another group of activities will include the analysis of the five pilot projects identified from the detection of "key problems" which affect sustainability of the regional water resources and which determine the territorial sustainable development.

The project will be successful if it succeeds in orientating investigations towards practical questions, based on solid technical knowledge, which might be useful in finding solutions to the questions, problems and conflicts which have been subject to errors for years.

It will succeed if the approach, question analysis and proposed actions enable the updating of methods of public-private management in handling natural resources especially water resources-, as well as uses, occupation and appropriation of territory, permitting the achievement of environmental and social sustainability.

Potential Project Partners

The project presented here has already raised the interest of many public and private organizations in the region, including:

- Ministry of the Economy, Argentina
- Secretary for Environment and Sustainable Development, Argentina
- Yacyretá Binational Organization
- The Regulating Authority for Electric Power, Argentina
- University of Buenos Aires
- National University of Misiones
- Universidad of Paraguay
- Salto Grande Binational Authority
- Bolivian Water Research Group
- Universidad de San Andrés (Bolivia)
- Asociación Paraguaya de Mediación
- Green Cross Argentina
- Green Cross Brazil
- Green Cross Bolivia