WATER FOR PEACE IN THE LA PLATA BASIN
MARCH 2003, DRAFT REPORT

This report aims at establishing a general framework of the Plata Basin, identifying its potential as well as its main conflicts.

The lack of a GLOBAL STRATEGY on basin management, which requires a horizontal co-operation between the countries involved and an articulation at a national level between the social actors, the jurisdictions and their specific interests, and attempts against the evaluation of the basin's potentialities is the main cause of CONFLICTS.

Within the general framework of the PLATA BASIN([1]), the stage currently being worked upon is limited to the UPPER PARANÁ axis between the cities of RESISTENCIA – CORRIENTES and PUERTO IGUAZÚ – FOZ DO IGUAZÚ and CIUDAD DEL ESTE.

The choice is an important one, because it involves three countries (ARGENTINA, PARAGUAY and BRAZIL) and because this region of the basin offers the greatest investments in infrastructure works, which are conflict triggers. It also constitutes a geographical space of trans-national integration, with great potential for human development, right in the heart of the MERCOSUR region.

Consequently, and as a case study, the MODEL recommended through the development of this project for the UPPER PARANÁ axis will be extremely useful to be applied to other spaces of the Plata Basin in successive studies.

[1] Project The Plata Basin. Water management in territorial ordaining", October

THE PLATA BASIN

WATER MANAGEMENT IN TERRITORIAL ORDAINING

Hydroenergetic exploitation of multiple uses. Clean energy with self-renewable, non-polluting resources, for a sustainable development of society.

Special analysis of the Upper Paraná axis (Resistencia – Corrientes –Posadas – Pto. Iguazú). Special case studies

"Water management within the framework of a territorial strategy for sustainable development"

1. ANALYSIS OF THE BASIN TODAY

♦ INTRODUCTION

The Plata Basin is distributed throughout several countries, south of Brazil, southeast of Bolivia, Uruguay, Paraguay and northeast of Argentina. The whole territory contains a great variety of natural environments and resources. Its area surpasses 3.000.000 km^2. The main rivers which form the Basin are: PARANÁ, TIETÉ, IGUAZÚ, URUGUAY, PARAGUAY, PILCOMAYO, BERMEJO, and, finally, the Río de la Plata. Several major hydropower projects are already functioning in the Basin and as many others are being planned. The Basin's territory is the most socio-economically vital within MERCOSUR and the big cities of Buenos Aires and San Pablo are located there. Because of this, human pressure over the ecosystems, and specially over water, is very intense.

♦ DESCRIPTION OF PROBLEMS AND ISSUES

The main problem is the lack of a common strategy for all countries on the management and control of the Basin, in terms of compatibility of hydric resources of multiple uses, as well as in the ways of mobilizing resources and manners in which space should be occupied and organized. Treaties have been signed, but they are not enough, and, besides, they aren't always kept. Greater cooperation between the States is necessary, in the form of agreements and arrangements. The same applies to all social actors. Sectorial policies have a negative impact on the Basin resources. The Basin is in danger of suffering from accelerated environmental damange, which would affect its potential, specially in terms of HUMAN DEVELOPMENT.

♦ CONFLICTS' CHARACTERISTICS

The problems which we have briefly pointed out spark several conflicts. Incompatibility between works; important works which remain unfinished; incompatibility between the different uses of a same resource: WATER. Works, i.e. major infrastrucure projects, are planned and built without a proper strategic framework. Problems arise between energy production and navigation. On the other hand, presence and quality of the waters is seriously threatened by the uncontrolled expansion of urbanization; improper land use; localization of polluting activities and the building of infrastructure. Deterioration of natural environments has aggravated water related risks, such as prolonged droughts and devastating floods. Many of these conflicts affect the populations which are already more socio-economically weak.
All of which leads to the need of designing a common strategy for WATER MANAGEMENT, within the framework of a more substanital and integrated strategy, that of TERRITORIAL SUSTAINABLE ORDAINING AND DEVELOPMENT.

2. PROJECT DESCRIPTION AND JUSTIFICATION

♦ OBJECTIVES

Within the framework stated, the PROJECT'S MAIN OBJECTIVE aims at achieving a systemic approach to PROBLEMS and CONFLICTS, establishing the CAUSES which originate them, as well as the SITUATION AND PRACTICAL RECOMMENDATIONS tending to prevent conflicts, aiding in the solution of current and potential problems and promoting ways of development and cooperation, agreement, concertation and coordination, within the framework of a TERRITORIAL ORDAINING STRATEGY, following international experience.

♦ EXPECTED RESULTS

The realization of this project, already started at a first advance stage, its approach and methodology, will provide a global framework, allowing to evaluate PROJECTS in general, related to the Basin's socio-economic sustainable development, within the framework of the PROGRAM WATER FOR PEACE.

The development of this PROJECT and its RECOMMENDATIONS will allow the design of new and renewed MANAGEMENT STRATEGIES, based upon agreement and cooperation, thus diminishing the present problems and conflicts, strengthening HUMAN DEVELOPMENT.

♦ **ACTIVITIES AND ACTIONS**

As it is stated in the main part of the PROJECT, the ACTIVITIES and ACTIONS to be developed will aim at fulfilling the MAIN OBJECTIVE and the SPECIFIC OBJECTIVES. The RECOMMENDATIONS (transfer of practical knowledge to society), will issue from these activities, tending to modify the ways of acting within the Basin.

3.- BASIN PRESENTATION

The Plata Basin is distributed among several countries: south of Brazil, southeast of Bolivia, Uruguay, all of Paraguay, and northeast of Argentina. That is to say, it comprises a great continental sector of South America, limited to the north by the southern end of the altiplanos or chapadas of Parecís, the Matto Grosso plateau, and Dos Veadeiros, located near the 15° southern latitude. The southern limit reaches, with both margins of the Río de la Plata, the latitude of 35° south.

To the east, the basin stretches up to the broken line determined by the summits of the Atlantic border of the Brazilian massif and the ragged mountains of Uruguay, which extend up to meridian 44° west longitude. The ragged mountains and sierras which constitute this limit in the north-south sense are: Tapiocanga, Tiririca, Dos Piloes, André Quince, Da Marra, Da Canastra, Da Saudade, Das Vertentes, Do Espinazo, Da Mantiqueira, Itaberaba, Cantareira, Del Mar, San Lorenzo, Paranapiecaba, Bocaina, Espigao, Geral, Do Mar and the ragged mountain Grande of Uruguay.

The Western limit is very wide if we consider the sub-basins of the rivers Pilcomayo, Bermejo, Salado and Carcarañá, but if we separate them, we could establish the limit following an imaginary line near the meridian 60° Western longitude (between parallels 15° and 30°), and from there through parallel 30° up to meridian 61°, which would be the lower part of the Western limit until reaching parallel 35°.

The zone thus delimited has an extension of more than 2,000,000 km^2, situated between parallels 15° and 35° and meridians 44° and 61°. The total basin, including rivers Pilcomayo, Bermejo, Salado and Carcarañá, arrives at 2,550,000 km^2, and considering the Great Chaco zone, without drainage, included between its boundaries, arrives at 3,170,000 km^2, that is to say, approximately 17% of South America's surface.

Río de la Plata's hydrographic system is formed by all tributaries to Paraná and Uruguay rivers, by its main river-beds, the estuary, and some minor rivers which flow directly into both margins of the Plata. The whole system has a north-south general direction, with northeast-southeast partial directions, and in some other cases, east to west and vice versa.

The hydrographic net is constituted as follows:

- **Upper Paraná River:**
  Paranaíba – Grande – Alto Paraná, tributaries to the left margin and the right margin. Among them, the most important are: Tieté, Paranapanema and Iguazú River.

- **Paraguay River:**
  From its spring up to the southern limit of El Pantanal, and from there up to its outlet in the Paraná.

- **Middle and Lower Paraná River:**
  The main rivers on the right margin are: Negro, Tapenagá, del Rey, Paraná Miní and San Javier, Saladillo, Salado, Colastiné and Carcarañá. On the left margin, the rivers Riachuelo, Empedrado, San Lorenzo, Santa Lucía, Batelito, Corrientes, Guayquiraró, Feliciano and Gualeguay.

- **Uruguay River:**

Tributaries to the right margin, in Brazil, rivers Do Peixe, Das Antas and Pepirí Guazú; in Argentina, rivers Pepirí Miní, Aguapey, Miriñay, Mocoretá, San Lorenzo, Gualeguaychú. Tributaries to the left margin in Brazil: Isuhy-Assú, Piratinim, Ibicuy Quareim or Guarabim, Arapey and Tacuarembó.

- **The Delta:**
  Extends from Villa Constitución (Santa Fe), where the Paraná opens itself in two branches: the one which follows Buenos Aires coastline is called Paraná de las Palmas and it has important ports, such as: Ramallo, Obligado, San Pedro, Zárate and Campana. The other branch, on the opposite coast, is Paraná-Pavón. It has, on its external part, several branches, such as: Paraná-Pavón, Paraná-Ibicuy, Paraná de las Palmas, Paraná Guazú and Paraná Bravo.

- **Río de la Plata:**
  Río de la Plata is a big estuary which starts flowing at the eastern limit of Delta del Paraná, where it opens up in the shape of a triangle, whose base would be an imaginary line (of about 200 km. long) between Cape San Antonio, in the Argentine southern coast, and Cape Santa María, in the Uruguay's northern coast. We may consider that it starts to flow at the confluence of Paraná's main branch (Paraná Guazú) and the Uruguay river. Río de la Plata separates the República Oriental del Uruguay from Argentina, and along its coasts, several major ports are located here, including Buenos Aires, Montevideo and La Plata.

Climate was and is extremely important. The huge area drained by the Plata's hydrographic system extends itself from the subequatorial zone, through the tropical zones, towards the temperate regions, experiencing all the thermohydric conditions inherent to the latitude and all the alternatives of continentality; in accordance with the situation and height of the orographic systems which prevent the passing of winds which carry humidity. If we observe an isohyet map, we can see that, at the Eastern springs, rainfall reaches 3,000 mm. a year in Carambú (Brazil) and Puerto Bertoni (Paraguay); 2,000 mm. a year in Orán (Argentina); 840 or 763 in Río Cuarto (Argentina); showing great variability, according to the included areas.

A great difference in economics and quality and extent of infrastructure can also be seen depending on which part of the basin is being investigated. The Plata Basin constitutes a zone of great resources, exploited as well as potential. Besides, some of the greater demographic settlements in the Americas and the world, such as San Pablo and Buenos Aires (both among the ten largest cities of the world), are located here.

4- DESCRIBING MAIN PROBLEMS AND ISSUES

Following the brief description of the Plata Basin, it's possible to observe that its magnitude, the different ways to organize the basin's geographical space, the use of natural resources -specially hydric resources, create problems at different levels. Even more so considering that the space concerning the Plata Basin, a unit from the hydric point of view, is shared by several countries: ***Argentina, Brazil, Bolivia, Paraguay and Uruguay***.

The main problem is the lack of a common strategy for the different countries on basin management and ordaining, specially regarding compatibilization of energy exploitation.

Although some countries have special organizations to deal with the Plata Basin [2], these have proved to be ineffective in terms of specific actions.

There are multilateral and bilateral treaties and agreements[3] between the countries in order to manage sub-basins, but, in general, the results have been the disappointing.

At the sub-national level, and especially in the Argentine case, the provinces do not work efficiently either 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 a complete and integrated management of the Basin.

A second problem arises from this: the lack of a common strategy between countries; that is to say, there is no interstate water policy.

This leads to a third problem: sectorial policies (lacking ruling orientations and strategic reference frameworks) have negative impacts on the management of the basin's geographical space and on the permanence and quality of the hydric resources.

A fourth problem is posed by the difficulties in optimizing the different uses of hydric resources (multiple uses), starting with them provision of non polluting energy and helping navigation, within the framework of a sustainable transportation system.

Finally, "de facto" occupation of the territory, without a strategy on territory uses and ordaining, is causing accelerated environmental damage which greatly affect the hydric resources. Furthermore, it also aggravates social problems, increasing poverty, marginalisation, exclusion, indigence and causing higher rates in child mortality.

5.- CONFLICTS CHARACTERISTICS

The great problems which have been pointed out generate a series of conflicts:

- Incompatibility between hydric resources exploitation works, specially those related to energy.
- Lack of actions tending to compatibilize projects between themselves, stressing their positive aspects and diminishing their negative effects.
- Building of works and infrastructure projects without a strategic framework which might control and correlate them.
- Sectorial project planning. Example: Paraná-Paraguay hydroway, disconnected from any global strategy of transportation and territory ordaining.

[2] An example in Argentina is the Comisi n Nacional de la Cuenca del Plata
[3] Such is the case of the Comisi n Mixta Argentino-Boliviana sobre el Alto Bermejo or COREBE —Corpo R o Bermejo-.

- 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, their permanence, and the rise in conflicts created by water risks (swellings, floods, droughts, ecc.).

- Among the main processes which originate conflicts we can mention the following:
  - Uncontrolled urbanization and periurbanization processes.
  - Compulsive extension of vertical and horizontal farming and cattle frontiers.
  - Clearing by fire of woods and forests, and accelerated de-forestation.
  - Losses in biodiversity.
  - Migrations and a strong demographic pressure on the ecosystems.
  - Soil deterioration, erosion and drayaging.
  - Increase in sedimentation in the Basin's water basins and decrease in water flows within the river-beds.
  - Greater rhytm and an increase in risks due to unforeseen swellings and floods.
  - Diminishing in the life span of hydric works, due to an acceleration in dam buildings.
  - Sudden changes in ground water levels.
  - Increase in frequency and duration of droughts.
  - Anarchic development of human settlements and a pronounced increase in population and river pollution.
  - Serious problems of increase in poverty and exclusion, causing that a great part of the population does not have access to clean water and sanitation.

- All this is aggravated due to the lack of integral plans and agreements between countries, jurisdictions, sectors and social actors.

All these conflicts are found all along the Plata Basin, although they are more serious in certain regions or sub-basins.

This project aims to obtain an overall vision of the Plata Basin, in order to focus later on the pilot cases, first of all that of Upper Paraná. These pilot cases will enable us to appreciate problems and conflicts better, allowing us to recommend specific actions in terms of management (planning, cooperation, agreement, coordination, ecc.).

Consequently, the actions (activities) which this project intends to develop are closely related to the main problems and conflicts identified.

This is where the project's main thesis acquires an important magnitude. Gradual overcoming of problems and conflicts requires a strategy for territorial ordaining and development which takes into account the hydric resources. This strategy should be driven by cooperation, agreements, planning and coordination between countries, jurisdictions and economic and social actors. We need clean energy in order to arrive at a sustainable socio-economic development within the Plata Basin.

This is important, considering that most conflicts are due to management and planning institutional problems; sometimes due to lack of trust and, consequently, lack of agreements between countries, states or provinces, or between social actors. In order to overcome many problems and conflicts, political will is required, and this is something which isn't always achieved.

This is why this project will be aimed at exhaustively acknowledging the situation, in order to provide recommendations tending to the solution of problems and conflicts.

PROJECT FOUNDATIONS

The geographical space concerning the Plata Basin constitutes, even with its massive dimensions, a space unit within a larger territorial entity, that of the MERCOSUR region.

Many studies have been done on the Plata Basin, specially regarding problems related to energy uses and there is an extensive documentation and bibliography 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 none of them, either, studies it from the perspective of human development. A transversal vision, extending beyond the sectorial approach which has prevailed until now, will allow us to interpret the interactions between the natural environment, with emphasis on the water and the built environment, specially as regards the needs and rights of the people to water access.

Consequently, it is imperative to have an overall approach of the space concerning the Basin. Then, it will be necessary to apply this methodology to a region of the Basin exposed to multiple uses, and where water regulates the territorial system. Such is the case of the UPPER PARANÁ AXIS.

Therefore, the proposal considers the following approach:

- Water shouldn't be considered only as a resource, and even less purely as an economic asset. The current trend is to consider it as a PHYSICAL MEDIUM (Moratilla, 2001), which implies it should also be considered as a social asset. That is to say, water for peace.

- Water, considered as a physical medium, becomes the strategic asset, that is to say, an inseparable association between social development and the water culture. Water for human development.

- Thus, *proper water management* should be framed within a TERRITORIAL DEVELOPMENT AND ORDAINING STRATEGY of the basin as a basis for SUSTAINABILITY.

- Consequently, it's necessary to develop *transversal visions and actions,* 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 habitats and their resources.

- *A local and transnational dimension* is required for the analysis of situations as well as for advising on strategies.

- This is the main thesis for the development of the project: **"Water management within the framework of a territorial strategy for sustainable development." Water for peace.**

- A TERRITORIAL STRATEGY aims at attaining balanced and sustainable development, through the reinforcement of social and economical cohesion.

- This method leads to socio-economic integration based upon the respect for diversity in the different territories.

- This implies PROVIDING TERRITORIAL ORIENTATION to sectorial policies, in the analysis stage as well as in the management stage, with special emphasis on those policies of high territorial impact. (See Annex –1-)

- Within this framework, water, from the point of view of territory development and ordaining, should be considered as a physical-natural medium of the said territory. Its protection and preservation, *through efficient and sustainable water management, are key elements in the integrated strategies of territorial development and ordaining,* in order to strengthen HUMAN DEVELOPMENT.

- The territorial strategy offers the possibilities to promote the integration of sectorial management measures for hydric resources with the objectives of protecting and preserving the ecosystems. Likewise, it is the reference framework used to coordinate with other sectorial policies (production, energetics, transportation, urbanization, etc.) and with the different administrations (national, regional, local) and, above all, with frontier cooperation, within the framework of transnational integration.

- An integrated management of the resource should be inscribed within a general framework of territorial ordaining and development and, besides, it should also be established as a priority for possible water uses. SECURITY AS AN OBJECTIVE; SUSTAINABILITY AS A CONDITION AND WATER USE AS A SOCIO-ECONOMIC FACTOR.

6. PROJECT OBJECTIVES AND JUSTIFICATION FOR GREEN CROSS TO BE INVOLVED IN IT

The objective has a main core and specific objectives:

Main objective or core

The main objective of the project aims at a systemic analysis of problems and conflicts present within the Plata Basin; specially in the identified subspaces (pilot projects) with the intention of establishing recommendations tending to preventing conflicts, guiding in the solving of potential or present problems and promoting forms of cooperation, agreement, arrangement and coordination, within the framework of a territorial development and ordaining strategy. Priority will be given to the projected hydropower exploitations: the new dam at Corpus (Upper Paraná); and the raising of the Yacyretá dam level (Upper Paraná).

Specific objectives

- To undertake horizontal analysis which will associate and identify water uses with the urbanization process; localization of productive activities with land uses and appropriations; infrastructure design and functioning and the integrated management of natural habitats and their resources.

- To orientate the analysis of the multiple interrelations derived from the previous objective, to explain and interpret water uses in territorial ordaining as well as to establish new technologies in integrated management of hydric resources (proper water management), with special emphasis on hydropower, navigation, sanitation and supplying of drinking water projects.

- Within this context, to identify hindrances and benefits (weaknesses and potentialities) for the adequate management of the extensive basin in a modern sense.

- To identify and show the possible means to improve management through a case study.

- To guide work development in such a way that it will allow comprehension, perception and public and political awareness about hydric resources management. This should be done considering territorial ordaining aspects, anticipating and preventing interjurisdictional conflicts, specially international ones.

- To propose innovative ways of participation for society at all levels, in terms of analysis as well as in terms of management.

- Within this framework, to promote dialogue and agreements between social actors, specially reinforcing dialogue between political parties, aiming at maintaining agreement and coordination mechanisms.

- To identify present and future scenarios in terms of the re-functionalizing processes of the territories which might arise within the Basin, due to political transformations, state reforms, decentralization, grants and privatization, new managerial logic on the territory, the incorporation of new technologies in the production of goods and services; changes in urban economics; modernization-exclusion processes; migrating currents; new infrastructure; pressure on the ecosystems and its resources; population growth and dynamics; new infrastructures and its effects on the geographic space of the Basin, all of which originate processes of global change.

- To anticipate and prevent conflicts which might occur, at international level, as a result of unilateral actions or as a consequence of the internal dynamics of the SOCIETY – ECONOMY – ENVIRONMENT– and TERRITORY system, with special emphasis on the management of shared hydric resources.

Project justification

Although the PROJECT basis has been developed in point 3, certain aspects which justify its realization should be added here.

- In a global perspective, the Plata Basin is not only a part of MERCOSUR, but also, because of its geographic position, is part of a central region. This region is that of the greater socio-economic dynamics, offering the most dynamic urban systems and the highest exchange flows through transport and communication networks. At the same time, natural environments, their resources, and specially hydric resources, are subject to a strong antropic pressure. There are also very high levels of poverty and exclusion.

- Consequently, the permanent interaction between surface water and socio-economic development reaches such magnitude in terms of dependency on the Basin's hydric resources and with the increasing deterioration due to society's pressure, that it justifies the development of this PROJECT, with the approach and methodology which has already been presented.

- There is a lack, within MERCOSUR and particularly within the Plata Basin, of a TERRITORIAL ORDAINING AND DEVELOPMENT STRATEGY which would guide processes in the search for a territorial re-balancing, greater economic and social cohesion and a balance between territorial competitiveness and environmental sustainability. Total and integrated water management must be an essential part in this strategy.

- The approach to hydric basins 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 territory occupation and uses and their resources within the Plata Basin.

  Furthermore, when recommending actions tending to solve problems and alleviate conflicts, the approach of territorial ordaining policies will enable solutions with an integral and integrated vision of the Basin. This will facilitate cooperation and agreements between countries, jurisdictions and social actors. This is the project's objective.

- Consequently, the PROJECT is even more justified, as it allows us to establish, according to the indicated objectives, an identification of ruling principles for a sustainable territorial development within the Plata Basin.

- Considering hydric resources, and particularly hydropower resources, as closely related to socio-economic processes, new challenges and perspectives appear, in terms of Management, in order to attain a sustainable territorial ordaining policy.

- It is crucial, in order to prevent new conflicts and to increase benefits, to reinforce cooperation among the Basin's member States; a more active participation of regions, provinces and municipalities, as well as more active citizens' participation and a permanent collective work between the public Administration and the private sector.

- The carrying out of this project, with this approach and methodology, will allow us to have a global reference framework for the future, where it will be possible to analyze and evaluate different public and private projects examining their impacts at different levels.

- Besides, a greater trans-border cooperation is also necessary, considering that the different river streams in the basin are potential basis for the development of wide transnational fringes. The main PILOT PROJECT selected is a perfect example of this case.

- Furthermore, the project is widely justified as it promotes the idea and the awareness about the need and opportunity of joint management for the Basin's hydric resources and territorial ordaining in order to aspire to a sustainable development and regional security.

- This implies a total innovation in PUBLIC POLICIES, jointly agreed by the State members of the Plata Basin.

- This strategy could later be extended to greater spaces, such as the integration of the Platinean territory to the Andean and Patagonian areas in South America.

Reasons for electing the subregion

The Upper Paraná subregion as well as the region which includes ***pilot projects*** have been selected to represent specific cases which show more clearly the problems and conflicts identified.

- **Upper Paraná subregion**: constitutes a transborder fringe where the Paraná river is fundamental to regional life. Besides, it is subject to a strong pressure caused by several undertakings. Among them, Yacyretá's dam (one of the biggest in the world), which at present is being enlarged with a new Central over the outlet and through the raising of the dam level. At the same time, another dam, Corpus, will be built upstream in Posadas, including an hydroelectric plant. To all this, there must be added the works corresponding to the Paraguay-Paraná hydroway, the foreseen ports (Santa Ana – Urugua-i) and related existing undertakings such as Itaipú (Brazil) and Urugua-i (Argentina).

- There should also be note taken of the works linking new ports, highways and railways, as well as a reordaining for urban areas affected by the dam waters. All this will have a strong impact on the environment, with special emphasis on some protected areas, such as Iberá's marshes and Iguazú National Park.

All of the above, briefly summarized, shows the importance of the selected subregion and its relationship with the territorial ordaining project. This view will be the most appropriate in order to promote WATER MANAGEMENT FOR PEACE.

CASE STUDY: THE UPPER PARANÁ AXIS

WATER MANAGEMENT AND TERRITORIAL DEVELOPMENT IN THE UPPER PARANÁ AXIS

- The main thesis should be the need and opportunity for a global, integrated approach of development for our countries. Physical integration, development and territory ordaining must create a common strategy which promotes cooperation between the countries.

  Water management and its multiple uses as an economic-social development factor of sustainable territorial ordaining, having as a main objective HUMAN DEVELOPMENT and ENVIRONMENT PRESERVATION.

  MERCOSUR's common space constitutes a unique space with multiple territories. One of the current challenges is how to integrate and articulate these territories in order to overcome fragmentation and exclusion. Integrated utilization of the hydrographic nets can help noticeably to insure social and economic cohesion, to promote human development and to preserve natural and cultural heritage.

  Territory ordaining, through strategic planning, can be defined as a systematic way of guiding changes, creating the best possible future for society regarding its environment and its territory. More specifically, it is a creative process which lays the foundations for long-term integrated action, establishing a continuous system for decision-making, identifying specific courses of action, enunciationg follow-up markers on the results, and involving local economic and social actors in the whole process. Besides, it constitutes a global framework, a future scenario where sectorial policies and their effects will be coordinated.

  Within this framework, the geo-historical meaning of regional integration process should not be forgotten. In this process, we must place HUMAN DEVELOPMENT at the centre of environmental ethics. The right that thousands of individuals have to live and work in safe conditions and to have proper health care must be fundamental objectives, along with the environment preservation and utilization. Within the basin, water management for peace.

- WATER must be the tool used to comply with these priorities within the Plata Basin.

  Water, considered as a physical medium, becomes the STRATEGIC ASSET; that is to say, an inseparable association exists between social development and the water culture.

Thus, proper water management must be framed within a territorial development and ordaining strategy of the Basin and the UPPER PARANÁ axis, as a basis for sustainability.

A main principle is that SUSTAINABLE DEVELOPMENT is in itself INTEGRATED DEVELOPMENT, finding a balance between the use of natural resources and territorial environments on one side, and ecosystems on the other. The central point of balance is HUMAN DEVELOPMENT.

With regional integration, our countries should organize themselves within a common macro-space, and in subregions such as UPPER PARANÁ. This would allow the full use of natural resources (water as a trigger for development and security), as well as capital, human and technological resources.

The intention is to attain, through integrated water management, a process of sustainable development in the UPPER PARANÁ axis region, which might serve as an example of integrated MANAGEMENT to be later applied in other regions of the BASIN.

- The UPPER PARANÁ axis constitutes in itself a transborder region extremely important within MERCOSUR's physical integration.
  The UPPER PARANÁ axis becomes even more strategically important when considering the works built and projected in order to ensure hydroelectrical production, navigation, flood swellings control and the promotion of economic and social development.

  From the point of view of HUMAN DEVELOPMENT, the fluvial space in question meets a system of human settlements; among them, regional metropolis and intermediate cities which concentrate great populations. The HYDROWAY's main axis connects MERCOSUR's two metropolis, SAN PABLO and BUENOS AIRES.

  Tropical and subtropical environments which the river axis crosses show conflicts in land uses, illegal settlements where exclusion and poverty are rife; an increasing deterioration in lands, woods and forests; erosion and drayaging processes; clearing by fire of forests in order to introduce crops, which later lead to soil exhaustion; severe alterations in the hydrologic cycle at local level and significant losses in biodiversity. All these conflicts aggravate social problems.

  HUMAN DEVELOPMENT, under improper water management, is seriously compromised. Rural - urban migrations cause, in peripheral cities, environment deterioration, as well as social exclusion. Rural - rural "itinerant" migrations produce occupation - abandonment - occupation of natural environments, leaving them severely deteriorated. Within this context, in tropical - subtropical environments, problems in human settlements regarding health, sanitation and food, get worse, affecting the socio-economically weaker populations.

The general picture, as seen through social conflicts in terms of human development, show high levels of social inequality and environmental unsustainability.

That's why the PROJECT's development must conclude in the building of different scenarios of INTEGRAL DEVELOPMENT and SUSTAINABLE TERRITORY ORDAINING, aiming at the future, and starting from a WATER MANAGEMENT which articulates opposing interests. Ways of PUBLIC - PRIVATE action should be found, involving private companies in integral development, thus making it possible to find new methods of cooperation between local and national governments.

Likewise, WATER, within this context, should become a VITAL RESOURCE for DEVELOPMENT, hydroelectric energy, navigation and tourism. Controlling catastrophic swellings, complementary irrigation and the supplying of drinking water are some of the multiple uses of hydric resources which should be taken into account. Granting access of all the population to water benefits, will insure PEACE.

Proper WATER MANAGEMENT may be the strategic factor which, under an integral vision – sustainable territorial development – might create conditions of social and economic development in the region, thus helping to overcome the serious problems of social injustice and lack of environmental sustainability already pointed out.

The Upper Paraná Axis in the Argentine - Paraguayan – Brazilian section, Resistencia – Corrientes – Foz do Iguazú, is subject to great interventions already made and others yet to be made. Those already made, not inscribed within any global framework, such as the methodologies this work considers, are generating both positive and negative influences. The works projected are not conceived as part of a system either. Consequently, it should be expected that the conflicts will get worse. *This project aims at correcting this situation.*

WATER TRANSPORTATION

Ports

The Argentinean Law 24.093, known as "law of ports", completely re-formulated port regulations. This law promotes the participation of private capitals in the exploitation and management of ports, moving their administration to their provinces or municipalities, aiming at de-centralizing them from the National State.

Regarding specifically river transportation, it should be noted that current conditions of the rivers may imply limitations to their use. Naturally, if the rivers are not in good condition, the transportation will be more expensive, or even impossible to perform normally.

However, these problems are gradually disappearing in Argentina, and today they can be found only in certain specific sea ports, where dredging works are in progress. Likewise, the access of the private sector to the operation and management of ports brought along investments and know-how which were badly needed.

As regards river transportation, the restrictions that threatened this means of transportation are also being withdrawn.

The study describes the improvements effected at the ports of the analyzed area, specially those located on the Paraná river, such as Barranqueras, Goya, Reconquista, Santa Fe, Diamante; private terminals located north of Rosario (Rosafé), Rosario, San Nicolás, Ibicuy and Zárate; on the Uruguay river, such as Concepción del Uruguay, or on the Upper Paraná, such as Ituzaingó and the western ports of Misiones; and that of Formosa on the Paraguay river. A special reference is made to the project Complejo Multimodal de Transferencia de Cargas Corrientes-Chaco. Although this project is still far from being completed, a description of same is presented.

It should also be noted, in the ports sector, the existence of a project for investment in infrastructure and institutional strengthening has been agreed with the Banco Interamericano de Desarrollo (BID), known as “Ports Infrastructure - Ports Modernization". This project is divided in two subprograms: one is that of ports improvement, aiming at reducing the costs of waiting in bay and of ships loading and unloading at key ports of the system, thus facilitating cargo entrance and exit to and from the port. The other subprogram is that of safety and environmental protection. This program aims at reducing pollution problems related to sea and river transportation, improving their ability to prevent losses, including fires, leakages and spillings in port areas.

River transportation becomes specially important in the Resistencia-Corrientes corridor. Cargo coming from and going to other locations interconnected through the corridor under study will be transferred to other modes at the port of Barranqueras.

PARANÁ – PARAGUAY - PLATA HYDROWAY PROJECT

Hydroways

There are five projects which clearly show the evolution experienced by waterways. During the last few years, specific actions were taken aiming at improving these waterways. These projects are: Santa Fe al Océano, Santa Fe al Norte, Dredging of the Martín García Channel, Dredging of the Uruguay River and Paraguay-Paraná Hydroway. It should be noted that the Paraguay-Paraná Hydroway project comprises the three first ones, and it also includes other countries in the region (Brazil, Bolivia, Paraguay and Uruguay).

Besides, we should also mention the Tieté-Paraná Hydroway, which, although is not yet operative, will connect, as soon as certain infrastructure works are carried out, the rich industrial zone of San Pablo in Brazil with the Río de la Plata, by both waterways.

The Santa Fe to Ocean project has been fully operational since 1997. It consists of the dredging works performed which define the depth of the waterway at 32 feet from Puerto San Martín (near Puerto Rosario) to the Ocean and 22/23 between Santa Fe and San Martín. The realization of this project has resulted in a remarkable improvement in the navigability conditions in the Paraná River in this section; enabling the access of bigger ships to the waterway. This has created an increase in the services offered, as well as greater volumes in load flow: in short, an increase in river transportation for the region.

The Santa Fe to the North project is about to start works financed by the CAF and monitored by the P.N.U.D.[4], and it aims at increasing river transportation. This would mean greater export volumes for Argentina, Brazil, Paraguay and Bolivia. The means to attain this is by ensuring at all times the 10 feet depth in the section that relates Santa Fe to the north, whether it be through the Paraná and Paraguay up to Asunción del Paraguay, or through the Upper Paraná up to Iguazú. It should also insure a width of 100 meters for the channel, a proper and effective marking with buoys, as well as taking the necessary steps to allow the updating of the nautical cartography. Unlike the previous one, this project doesn't consider a toll fare for those ships sailing north of Santa Fe. Works will be financed with National funds.

The dredging works for the Martín García Channel include those referred to the opening of dredging and its maintenance at 32 feet depth and 100 meters wide, all along the works. This work complements that of Emilio Mitre Channel, section of the Santa Fe to the Ocean project, providing the system with two exit possibilities.

Besides, progress is being made in the works of deepening and marking with signals the Uruguay River. Here the objective is to reach 23 feet up to the port of Concepción del Uruguay, in Entre Ríos. It is anticipated that in a further stage, it will reach 17 feet up to Puerto de Colón (Paysandú in Uruguay) and 9 up to Concordia (Salto in Uruguay)

[4] C.A.F.: Corporaci n Andina de Fomento
P.N.U.D.: Programa de las Naciones Unidas para el Desarrollo.

Paraguay - Paraná Hydroway

This project originated in 1988, with a study developed by Internave. It received a greater force with the creation of the Hydroway Inter-Governmental Committee (Comité Intergubernamental de la Hidrovía) in 1990, as a result of a political decision taken by the governments that share the waterway. The countries also agreed with the BID the development of studies, through funds provided by World Bank, FONPLATA and the National Governments.

In March 1995, studies to determine the feasibility of modules A, B1 and B2 were started, by the Consultants Hidro Services (Engineering) and Taylor (Environment). On April 3rd and 4th , 1997, the Hydroway Inter-Governmental Committee (Comité Intergubernamental de la Hidrovía , CIH) had its XXIII meeting in the city of Corrientes (Argentina). There, the final report of the B2 module was approved, and it was established that the member countries would submit it to their qualified institutions. In 2002, the Corporación Andina de Fomento (C.A.F.), will finance the project under the supervision of P.N.U.D.

Likewise, the final reports from the technical teams, the Regulations for free-boarding for Hydroway ships, and the Regulations for Infringements and Sanctions, among others, were also approved. The results of these studies are currently being openly discussed by the different actors involved in this great regional undertaking.

In a first study developed by the Brazilian Consulting Company Internave, the area of influence of the Paraguay-Paraná Hydroway was defined. This same study estimated and appraised loads and transportation flows from the region to the Hydroway.

This work defined the Brazilian territory in the States of Rondonia, Mato Grosso and Mato Grosso do Sul, comprising 112 municipalities in the country. In the case of Paraguay, the country was considered as a whole; and in the case of Bolivia, the Santa Cruz Department. In Argentina, it was considered as area of influence the area defined in the study of technical-economical feasibility for the improvement of the Paraguay-Paraná waterway, performed by the Consulting Company Argentina Conarsud S.A.

In the case of Brazil, the final analysis of costs of alternate transportation showed that the area of influence of this country in the Hydroway, and applicable to grain transportation –the main good to be transported, would comprise certain municipalities of Mato Grosso, because for the rest, the price to the ports of Paranaguá and Santos are more attractive; while for Rondonia the option of the rivers Madeira and Amazonas (Porto Velho-Belem) is cheaper.

Based on the studies mentioned, and adjusting even more the definition of the area, the area of influence was defined, from the analysis of new and projected corridors for merchandise flow, specially for exports, clearly defined by other competitive methods of water transportation. This area of influence included the two Brazilian states already mentioned (Mato Grosso and Mato Grosso do Sul, identifying the departments directly or indirectly affected by the project), the Department of Santa Cruz in Bolivia, all of the

Paraguayan territory, eight Argentine provinces (most of them include all of their territory), and the Department of Colonia in the República Oriental del Uruguay.

Ports settled on the Paraguay-Paraná Hydroway offer a great variety in size, uses and installations. In the upper part, ports are small and can only serve river barges. On the other hand, barges are, together with the tugboats which tow them along the river, the cargo boats suitable to the depths. Therefore, their movements are primarily limited to non processed forest or agricultural products and to minerals.

In the middle section of the Hydroway, ports show dimensions and movements slightly bigger, and to the movements mentioned for the upper part, there should be added processed agricultural products and general cargo, the latter in small to medium volumes. Bigger river barges have access to these ports, as well as small river/sea boats. This section is about to be given in concession in order to ensure the 10 ft depth at all times, thus allowing navigation and maneuvering for barges, as defined in the project.

In the lower part, ports change greatly. The natural depth of the river allow access to big ships. Considering that recently there were officially opened in this stage the works that brought draft at 32 feet to the ports of San Martín and San Lorenzo (north of Rosario) and at 29 feet from there to the Port of Santa Fe, the way allows easy access to the grain ports in Argentina. They export more than 70% of these loads, and they provide, in lesser quantities, the remaining cargo that they receive at the sea ports (Bahía Blanca, Quequén), resulting in cost and time savings.

In this section of the Hydroway, port installations show great differences according to the cargo they handle. There should be noted agricultural terminals (seeds and by-products), the dry goods terminals (coal and minerals), docks for general cargo, generally used for dry goods and agricultural products, and terminals for liquid hydrocarbons.

Current situation

Beyond certain specific criticisms made, specially the excessive amount of regulations, the organizations that use the waterway acknowledge, in general, a great advance during the last five years. However, they think that modernization of control mechanisms, specially regarding customs, should continue.

It should be noted that freight charges by the Paraguay-Paraná Hydroway are between 30 to 40% higher, due to the difficulties for navigation that still exist along this waterway.

Tietê-Paraná Hydroway

Although the first works for the Tietê-Paraná Hydroway go back to the 1950's, more serious studies were started by the Companhia Energética de Sâo Paulo (CESP), AIMING AT MAKING FULL USE OF THE WATERWAY KNOWN THEN AS THE alcohol hydroway, with the financial support of the Banco Nacional de Desenvolvimiento Económico y Social.

The area of influence of the Tietê-Paraná Hydroway includes five Brazilian states: Sâo Paulo, Goiás, Minas Gerais, Mato Grosso do Sul and Paraná, with a total surface area of 76 million hectares.

In 1996, when the floodgates of Três Irmaos and Jupiá started to operate, the Tietê-Paraná Hydroway had a navigable extent of approximately 2,400 km; of these, 1,700km correspond to main hydroways.

The increase in estimated shipment is of at least 12 million tn/year, for half the next decade, with a fleet of 500 barges and 250 tugboats. The investment to be made in the fleet during the next decade is estimated at US$ 500 million. The maximum cargo capacity in the hydroway is estimated at 20 million tn/year at the Tietê strait.

At present, grains are carried through the hydroway from Jupiá to Santos, enabling a reduction in freight charges of US$ 15 per ton, as compared to truck transportation.

With the active operation of the floodgates of Jupiá and Três Irmaos, in the Brazilian fringe of Upper Paraná, only the Itaipú fall will remain to be conquered and thus the producer and consumer regions of San Pablo, Mato Grosso do Sul, Goiás, Minas Gerais and Paraná will connect themselves to the Argentinian and Uruguayan market through the Paraná river, counting on a navigable extension of 2,400 kilometers, thus enabling commodities transportation. The system will be known as MERCOSUR' s Internal Hydroway System.

It is foreseen that 10 centres of regional development will be established around the main terminals, which are: Artemis/Piracicaba, Conchas, Pederneiras, Aracatuba, Sâo Simâo, Santa Fe do Sul, Panorama, Presidente Epitacio, Rosana and Ilha Solteira. An estimated investment of US$ 4 in infrastructure for each ton loaded or unloaded suggests an investment at the terminal of US$ 160 million to be verified during the next decade.

There isn't a program on fleet expansion and terminals installation, and commercial needs will be solved as they appear. The Brazilian government thinks his role is that of providing basic infrastructure for the channel, gates, etc., being the commercial development and effective use of the way responsibility of the private sector.

It is planned to build a dam at Santa María da Serra, extending the way along the Piracicaba river. This will bring traffic for about 107 miles to Gran Sâo Paulo (San Pablo) and to all the rich industrial region around Campinas.

With the opening of the last floodgates, during the first half of 1998, the Tietê-Paraná Hydroway is now fully working, allowing barges to navigate from Itaipú dam up to the highways and railway terminals near the city of San Pablo.

There are opportunities to build dams/gates of greater contribution, extending the way along secondary channels. These extensions, specially to the west of Paraná River, would favor a big agricultural area.

8 gates have been built along the Tietê-Paraná Hydroway, which are already in operation in the Tietê River section:

Barra Bonita	Km. 457
Bariri	Km. 397
Ibitinga	Km. 325
Promissâo	Km. 219
N. Avanhandava Superior Inferior	 Km. 169 Km. 168
Tres Imâos Superior Inferior	 Km. 31 Km. 30

When the Jupiá gate starts operating, the Tietê, Paraná's Northern Section and Southern Section systems will be connected with 2,400 km. fully navigable. Of these, 1,642 km. are in the main channels with a depth equal or higher than 2,5 meters, and 758 km. are secondary channels with a depth equal or higher than 1,5 meters.

At present, the Tietê River is fully marked with buoys, and the marking with buoys of the Paraná River in that area is under study.

Investments in the area of the Tietê-Paraná Hydroway are estimated at US$ 6,000 million, generating 6,600 jobs.

This system will allow the navigation for convoys with cargos from 6 thousand to 15 thousand tons, connecting Buenos Aires to San Pablo in 8 to 10 days. The connection between Upper Paraná and Middle Paraná, at Itaipú, where there are no floodgates and the fall is of 120 meters, will be made at first by land, with cargo transfer.

Transportation from San Pablo-Buenos Aires by land ranges between US$ 90 to US$ 110 per ton, via Porto Alegre-Uruguaiana. In spite of transporting great volumes, many exporters discard transportation by sea because of its many inconveniences: waiting time at port, high storage and stowage rates, container expenses, which may increase the freight charges up to an amount between US$ 120 and US$ 150 per ton of cargo between Santos and Buenos Aires. Railway freight charges are between US$ 80 and US$ 90 per ton. In spite of the cargo transfer at Itaipú, the hydroway freight charge, including terminals, is estimated at about US$ 55 per ton.

In order to start operations at the Tietê-Paraná Hydroway the Compañía de Navegación del Amazonia (CNA), a subsidiary of the Grupo Libra, has ordered the building of 5 tugboats at a cost of US$ 15 million.

The Grupo Libra has formed a new corporation, CNT, as shipowner and river terminal operator at the Tietê River. It started to operate jointly with CNA in June 1997. The company operates a terminal located next to the CNT multimodal terminal at Pederneiras, State of San Pablo, and another one at San Simón, State of Goias. The barge convoy will

have a cargo capacity of 2,200 tons and it will reduce the final freight cost in more than 30%.

Connecting both Hydroways

The study “Project Profile for River Interconnection between Paraguay and Paraná Rivers", developed by the Ministerio de Obras Públicas y Comunicaciones of Paraguay (MOPC) proposes to connect the Tietê-Paraná and Paraguay-Paraná hydroways through an artificial channel to be built in the eastern region of the country.

The document proposes three options:

Jejui-Guazú River / Ytambey River: north of Itaipú dam with an extension of 374 km. Of these, 200 are already navigable, with a depth of at least 3 meters. It requires the building of 5 floodgates.

Manduvirá River / Limoy: Designed to have an extension of 370 km. Probably less floodgates to be built, but building will be more difficult.

Manduvirá River / Ytambey River: Designed to have an extension of 140 km., this will be the most expensive of all.

Hydroway competition

It should be noted that these hydroways are not the only ones who will compete directly for an important cargo volume, since Brazil has shown the political decision of developing new river corridors. In that sense, they are considering the utilization of the rivers which form the Madeira-Amazonas hydroway. Thus, they would start to compete with the two hydroways detailed here, aiming at obtaining the soy market in Brazil's southern region, which shows a remarkable future as far as production is concerned.

To leave Brazil, this production must reach seaports. Transportation by land would imply a freight charge of about US$ 80 per ton to travel 2,500 km. Meanwhile, if it should be made through the Paraguay-Paraná Hydroway, the freight charges from Cáceres up to the seaport is estimated at US$ 40. The new hydroway mentioned here, Madeira-Amazonas, presents one difficulty, and that is that grain should travel an important stretch by land up to Porto Velho and from there, travel by barge a distance of 1,110 km. up to the port of Itacoatiara, on the Amazonas River, there to be loaded in ocean ships. The same difficulty appears for the Tietê-Paraná Hydroway, since the cargo must travel 900 km. before arriving at the port, situating the cost per ton in around US$ 65.

THE PLATA BASIN.

SELECTED CASE STUDY
THE UPPER PARANÁ REGION

FIRST ADVANCE REPORT

Water management for sustainable territorial development, with special emphasis on Human Development, in order to answer to the premise WATER FOR PEACE

Within the framework of the PLATA BASIN INTEGRAL PROJECT, already developed, efforts are now centered in the Upper Paraná section. Within MERCOSUR's physical integration, this is the most important section of the basin.

It is an APPLIED INVESTIGATION PROJECT, showing conflicts generated by the application of sectorial policies, which lead to unsustainable development. From this analysis, it will be possible to start building future and possible scenarios, recommending courses of action through RENEWED WATER MANAGEMENT, and considering Human Development and Sustainable Territorial Ordaining.

This implies the integral development of the region, through the compatibilization of the different water uses. It involves intervention over the basin, dams, power stations, navigation works, bridges, etc.).

The project's objective is to propose a strategic plan for water management, agreed with the social actors and carried out under the horizontal cooperation of the countries involved. It would also allow, through coordination tools, the articulation of sectorial policies applied in the region.

The STRATEGIC PLAN which will be proposed, with its alternatives and options, will aim at establishing a relationship between WATER MANAGEMENT, HUMAN DEVELOPMENT and Sustainable Territorial Ordaining, tending to obtain social and economic cohesion in the region, facilitating access to water in terms of water for health care, sanitation, hygiene and development, for the population in general, and specially for those socio-economically weaker. Water as a development factor should therefore outweigh water as risk factor.

In order to attain this, an extensive consulting plan will be developed, directed at private and public sectors of the countries involved, different local administrations, state-provinces, town councils, centralized and de-centralized institutions, corporations, distinguished personalities, technicians and academics, NGO's and different organizations of civil society.

The PROJECT's implementation through international cooperation between the countries involved will not require additional economic resources, since a new way of water management as DEVELOPMENT FACTOR will be recommended. On the contrary, this management will imply a more rational distribution of existing resources and of investments, either programmed or already in progress.

Our countries need renewed forms of articulation between public and private, and modern ways of designing public policies which might fulfill the requirements of society. This is what this project intends to do.

The STRATEGIC PLAN will be an adequate reference framework for private investors. Public management through international cooperation should be highlighted and articulated, always seeking sustainable human development.

The PROJECT will adapt, in its development and execution, to the reference operational points for projects on Water for Peace. It will show, in its objectives and activities, the intentions prepared in 2001, for Water for Peace, and the new modifications which have been added.

WATER AS A DEVELOPMENT FACTOR. WATER AS A RISK FACTOR.

1. As it has already been pointed out in the project, river basins are a special challenge in territorial ordaining, from the human development point of view, since they are located in relatively narrow territory strips. These spaces are also characterized by very important natural elements (water streams, humidity with rich and sensitive ecosystems, beautiful landscapes, natural reserves, etc.), and by intensive and diverse human activities, such as industrial and urban settlements, transportation infra-structures and traffic flows; power production, including huge hydroelectric power stations, sand and gravel and rock extraction; regulation of the water streams, draining and allottments for touristic development. There can also be found cultural landscapes, which have been transformed along the years, and that have a special economic and ecological potential. Territorial ordaining has crucial improtance in reducing floods, attenuating droughts and in alleviating the catastrophic results of both events.

2. That's why *water management,* within this socio-economic, cultural, environmental and territorial context, appears as a STRATEGIC FACTOR.

3. Conflicts between the different functions of water uses in the RESISTENCIA – CORRIENTES – FOZ DO IGUAZU – ITAIPU section, can be prevented and reduced through joint handling of *water management and territory ordaining.* Its most signigicant elements should be:

   - Protection of fragile ecosystems.
   - The highest sustainable management of the aquatic system in all of the sub-basin (Plata Basin), paying special attention to the relationship between water uses - hydric balance.

- Integration of the hydric system with all territory ordaining and development components at all levels.
- Limitation of the expansion of urban zones in areas of ecologic value or in lands which might later be used for producing food.
- Flood prevention through the promotion of cooperation, aiming at an integrated and sustainable management of transborder and transnational river basins.
- Establishing *special programs* in order to ensure *development sustainability in the Upper Paraná axis.*

4. Along with conflicts and problems identification, it will be necessary to strengthen cooperation between states and jurisdictions at sub-national level. This should tend to horizontal cooperation in the enunciation of territorial development projects, and to vertical cooperation, among the different actors of regions and territories.

5. Finally, the effective participation of society in the integrated management of hydric resources and territorial ordaining should be supported.

6. In order to promote sustainable development within the framework of joint integrated management of trans-national basins, and considering the different water uses and origins, it is proposed to extend the RESISTENCIA – CORRIENTES – PUERTO IGUAZU RIVER AXIS PROJECT, as far as BRAZIL (ITAIPÚ), exploring the possibilities of river navigation north of ITAIPÚ.
   - This *transborder river axis of diversified economy* may become a strategic articulating space within MERCOSUR.
   - Water management can and must become a tool in achieving sustainable territorial development in the region.
   - It is considered suitable to work along three main points:
     ⇒ Navigation (sustainable river transportation).
     ⇒ Hydroelectric energy (sustainable technical use of water).
     ⇒ Preservation of natural and cultural heritage.
     ⇒ Human development through management of human settlements and proper water management.

   - The promotion of these four points would allow sustainable territorial development, reducing socio-economic weakness in human settlements and agrarian spaces. It would also reduce marginalisation and exclusion in big cities, promoting food production and creating jobs.

The PARANÁ – PARAGUAY HYDROWAY PROJECT; THE COORDINATION OF THE MULTIPLE USES OF DAMS AND THE IMPROVEMENT OF LIFE CONDITIONS FOR PEOPLE THROUGH ACCESS TO WATER BENEFITS, are three strategic axis in order to reinforce the idea of WATER FOR PEACE.

WATER MANAGEMENT, USES AND CONFLICTS

Within the Plata Basin in general, and specially within the UPPER PARANA fringe, there is currentlly a lack of proper, integrated water management, and even less sustainable territorial use.

This leads to a series of CONFLICTS, due, in general, to three main aspects:

- Interventions correspond to sectorial policies, and these are neither coordinated at horizontal level nor included in any Plan (energy, transportation, housing, forestation, cattle and agricultural activities, etc.).

- Lack of a territorial ordaining and development strategy, where WATER MANAGEMENT might be the key to of socio-economic development.

- Lack of cooperation plans at international level, within a framework of common strategies, as well as the lack of an inter-jurisdictional vertical articulation, between the different national states, states or provinces, and municipalities.

Within this framework, it is possible to observe that, as management of hydric resources requires a systematic vision of the environment, human organization within the basin should also be considered with that perspective.

The absence of this dimension, of water, environment, and territory, which this project aims to overcome, leads to an interrelated system of conflicts.

Among them we can identify:

1. Lack of compatibilization between the bi-national dams, reducing the optimization of river uses.

2. Lack of coordination between water and energy uses – dams, navigation - causing damages in the levels required by navigation.

3. Building dams with no access to navigation (Salto Grande).

4. Lack of foresight regarding power supply to the region. Most of the production is exported at inter-regional and international level.

5. Remarkable daily drops in the water levels at the lakes, leading to the forming of swamps, as well as to the multiplication of insects which cause tropical diseases.

6. The WORKS PLAN for great dams (i.e. YACYRETA) has not been completed. The territorial reordaining at the perilake zone, which should have been done at the same time as the building of the dam and the station, hasn't started yet. Consequently, the station works with less turbines and less power. Current level of 79 meters must be brought to 83 meters. This will generate a series of conflicts which must be faced by means of a TERRITORIAL REORDAINING PLAN, including a great part of the city of POSADAS. Something similar, although in a lesser scale, takes place at SALTO GRANDE, where the lake level should be elevated by 1 meter.

7. No plans to provide water for irrigation or drinking and sanitation have been developed, specially affecting a socio-economically weak population, which has a high child mortality rate and severe problems related to health care and hygiene.

8. Although compatibility between dams for multiple uses has not been adequate, there still exists the possibility of certain correcting interventions, and these will be a CENTRAL PART IN THIS PROJECT'S PROPOSALS.

9. In the UPPER PARANA region, the great work of CORPUS dam is being planned. This work, which has been much discussed, requires a series of decisions to be taken, aiming at optimizing its uses and reducing conflicts (see annex table).

10. The same thing will happen with the works of GARABÍ and SAN PEDRO, in the Alto Uruguay, but next to Corpus and, due to lakes conformation, “it would strangle” the wetland territory of Misiones with a strong environmental impact.

11. New and serious conflicts might arise from the realization of some other projects, under serious debate, from an environmental perspective. Two of them are the most important. The first one is the MIDDLE PARANA PROJECT. This project, although it is not located in the river section we're now studying, has a strong impact on it. The project is that of the CHAPETÓN and PATY dams (locks South and North, respectively). The objective is to produce energy and to create a semi-deep navigation channel at 21 feet. The other project is the water pouring from YACYRETÁ, to the Iberá marshes (an ecological reserve) and the possible sending of surplus to the Paraná and Uruguay rivers. ITATÍ dam, as YACYRETA's compensator, is the other dubious project which should be analyzed with a multi-criteria methodology.

12. The PARANÁ – PARAGUAY – PLATA HYDROWAY might develop conflicts, if it's not integrated, as a STRATEGIC PROJECT, to a multi-modal plan of transportation, by route and railway, as well as the interfaces, land transportation, access, terminals, ports and navigable ways. This requires international cooperation.

13. An INTEGRATED WATER MANAGEMENT, should consider surface and underground waters in the region, from springs and brooks to the great rivers. However, irrational occupation of the territory attempts against the permanence and quality of hydric resources.

    Irrational devastation of the native forest, its clearing by fire and the introduction of crops, "land invasion", are all producing a serious deterioration in the ecosystems, changing the hydrologic balance and the hydric balance. As an example, the following processes can be pointed out: clearing by fire, cleaning of foliage, introduction of crops.

    Vertical movement of water, rainfall, evaporation and infiltration is seriously altered because of the absence of forest and leaves on the ground. In great rainfalls, fifty per cent of the water fallen is retained by the vegetation, and then it evaporates, while the rest slowly infiltrates. The disappearance of forest and leaves alters this process,

leaving the naked ground to receive the direct impact of rainfall. Lack of infiltration, under the natural conditions which carry away carbon dioxide, natural precipitating agent of aluminium, which tends to climb capillarly, causes its arrival at the surface where it incrusts the ground.

Thus, great rainfalls fall on the naked ground, causing their run towards the rivers, finally filling them and reducing their leading capacity. The “low water periods” are more severe and the "avenues" more catastrophic. This shows that an intervention in one aspect of the natural system causes a biotic and abiot systemic reaction, with serious social, economical and environmental consequences.

14. Nowadays, since agrarian spaces have low profitability, there is a massive purchase of agricultural lands for forestation. This causes tensions in the uses and conflicts of the land, leading to one serious problem: rural lands are abandoned by the people and these people become marginal when they migrate to urban peripheries, showing social exclusion and environmental deterioration problems. (This process is actually taking place in Misiones).

15. Cities of the region have grown in a disorderly way, causing serious social and environmental deterioration; poor peripheries, exclusion and social polarization. In such a way, cities aren't sustainable. Almost half of the city population has no drinkable water, sewers or sanitation. However, the scale of the cities involved makes their recovery possible. To succeed in doing so, it's necessary to modify the linear development of the city, through a cyclic development. STRATEGIC PLANS are an excellent tool to obtain this transformation.

16. As we have already mentioned, half of urban population does not have access to water services, and the problem is even more serious for rural populations. This profoundly affects human dignity and health, and drives us away from the WATER FOR PEACE motto.

17. The region is affected by different infrastructure works, which have uneven impacts on the territory's sustainable development. Big bridges, connections and links, airports, highways, etc. Many of them have a direct effect on the rivers and their basins and sub-basins.

18. The recent Law of Territorial Ordaining and Development, sponsored by the Government of the Province of Misiones is a favorable event, which responds to the objectives of this work. Precisely, one of the intentions of the project we're developing is to extend this strategy to all the region involved.

19. There is an increasing pressure over NATIONAL PARKS and PROTECTED AREAS, with certain tourism practices which do not harmonize with the preservation spirit. The Province of Misiones, in a great effort, has declared almost 25% of its territory as natural reserve areas.

20. The UPPER PARANÁ axis should be considered, in a transborder development strategy, jointly by ARGENTINA – BRASIL and PARAGUAY, within the sustainable

framework of WATER MANAGEMENT FOR A TERRITORIAL SUSTAINABLE DEVELOPMENT. In this sense, and adapting to the regional reality, it would be auspicious to consider the region in plans of transborder ordaining, such as those developed by the European Union within the framework of EUROPEAN TERRITORIAL STRATEGY.

Reference chart

a. With regional integration, our countries should organize themselves within a common macro-space, thus allowing full and sustainable exploitation of resources, and specially proper water management.

b. In the Argentine section of the Plata Basin, **energy should only be a complementary benefit of navigation** and a neutralizer of predatory, extraordinary swellings.

c. Although navigation faces certain objections because of water pollution, **navigation systems must be sustainable**. From an environmental perspective, it's a better option than the railway, and certainly better than car transportation, which is now prevailing in the region. The HYDROWAY work, for example, will adapt the river natural conditions to navigation, and not the other way round.

d. By doing so, “multiple benefits” will result from the CREATIVE COMPETITION between our countries, where each one will maximise its own interests within the framework of comprehensive cooperation.

e. To optimize navigability and conditions of the fluvial axis, so that it may become THE GREAT ALTERNATIVE for transportation from the interior.

f. To preserve safety conditions for the vast riverside fringe along the Paraná river, where important productive and urban systems are located. That is to say, to optimize defenses against extraordinary, predatory swellings and floods.

g. UPPER PARANÁ's global exploitation, a sub-system within a greater one, should be made compatible with the other navigable axis in the region, particularly with TIETE. The floodgate system in the dams upstream ITAIPÚ are already finished. Besides ITAIPÚ's floodgate, it's important to achieve compatibility between ITATI(*); YACYRETA – APIPE, CORPUS and ITAIPU.

h. A conflict derives from the building of YACYRETA such as it was agreed. In previous discussions, it was held that, had YACYRETA been designed at Level 79 (Volpi), the level at the lake's pool wouldn't have affected Posadas, thus avoiding the spending of millions in the territorial reordaining of the perilake when raising the level. A lesser jump in YACYRETA, amounted to a greater jump in CORPUS, balancing energy production. With YACYRETA built at level 84, a careful compatibility with CORPUS is required.

(*)Itatí dam is a project which does not appear in the Agenda, although it does appear in the plans for full exploitation of the basin, still more related to the project of semi-deep navigation at 21 feet, derived from the MIDDLE PARANÁ PROJECT.

i. It is important to rectify certain errors not yet completed, and to add to the basically hydroelectrical objective, other "key" services, which were not taken into consideration by the CONSULTANT in due time.

Regarding CORPUS, it's necessary to establish an adequate compatibility with ITAIPU. Then, it could produce more state-of-the-art-energy, which Brazil needs today. If Argentina has no imperative energy needs for the next decade, then the question is: will it be necessary to build CORPUS ? The answer lies, beyond the objections the people of Misiones have, and which should certainly certainly be taken into consideration, in the relationship existing between CORPUS and ITAIPU. Although CORPUS isn't indispensable for insuring river navigation during its natural regimen, it's necessary in case those navigability conditions were to be modified by ITAIPÚ's operation. In this case, CORPUS' function, beyond the energetic one, is to preserve navigation downstream ITAIPU, homogenizing the same floodgates upstream ITAIPU (PARANA - ITETE).

k. The higher is CORPUS frontal dam, the more energy ITAIPÚ can produce. To optimize CORPUS - ITAIPU at a hydro-economic level is the great challenge to confront. Benefits will show in ITAIPU's generating hydroelectric energy during peak hours, which has a higher market price, and in the obtaining of net profits in global production.

j. CORPUS, with several location possibilities and with a concrete gravity dam raised above the operation level, will allow, with an “empty volume” the control of alterations in the navigation parameters, and will help in the defense against unexpected hydric disasters.

k. In this stage of physical - regional integration of our countries, optimum navigable conditions will be essential for all Plata countries. If Brazil plans to build, at high expense, ITAIPU's floodgates as a strategical priority for the PARANA – TIETE HYDROWAY, then the compatibilizations pointed out make more sense. The objective of the mentioned hydroway will be impaired by a river with sudden strong currents and marked timely ups and downs in the water levels, which will render ports and docks, whether elevated or submerged, inoperable. Apart from this medium -long term objective, Brazil needs, in a short time, more energy in peak hours; and it needs to increase, at medium term, the global demand (12% / year). That's why it needs to ask for supply to its MERCOSUR associates.

To sum it up, in this first advance stage it can be said that:

If **peace among men** goes hand in hand with **development**; **environmental sustainability** and **social equity** must be the objectives of human development. **MANAGEMENT OF HYDRIC RESOURCES** should prompt this development, the only way in which **WATER FOR PEACE** will be ensured.