

# Institutions and research for the Pantanal: towards a bi-regional research agenda to support policy institutions, legal frameworks and social action - INREP

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Specific Support Action

**Coordinator:** Dr Rob Jongman, Alterra, Wageningen UR, The Netherlands<sup>1</sup>

## Context and Objectives

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The project aimed to develop cooperation within the Pantanal and the Upper Paraguay River Basin in order to develop sustainable water management at river-basin scale and efficiency in water use. Its background motive was to strengthen the cooperation between policy makers, stakeholders and scientific institutions in Brazil, Bolivia and Paraguay and to stimulate the cooperation between these three countries, the European Science Community and NGOs working in the region. It has been concluded that the need for cooperation was great as there are economic, political and landscape ecological links between the three countries involved: All three are depending on wise water management; all three have common interests in the Pantanal for water, shipping and economic development and all three share this area but have different political systems that are not yet well coordinated. This project has been considered of interest for Europe as it has a long-standing tradition in river management, biodiversity and related research. The Water Directive and European concepts for water management have been partly guiding water legislation in Brazil. European environmental research groups from different countries have long-term research ongoing in the area, but cooperation and linkage with authorities were weak or absent. NGOs work in the region, but did not yet cooperate closely with European research.

The project proposed to build an agenda for international research cooperation between Brazil, Bolivia and Paraguay, the European Union teams and others. Therefore the objective of the project was twofold:

- Developing insights into the scientific, political and socio-economic actions, problems and solutions in relation to sustainable management of the Pantanal and the Upper Paraguay River Basin (UPRB);
- Strengthening institutional and scientific cooperation at national and international levels for the region.

To attain these objectives a process has been started to bring people of all parties together in workshops and a biregional symposium (Latin America-Europe); country reports and a research agenda for the Pantanal have been developed and reported to the Brazilian, Bolivian and Paraguayan governments and the European Commission. The process of formulating this agenda has been open to everyone, promoting transparency in all phases of the process.

## Activities

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Development of a policy-supporting research agenda has been carried out involving representative groups in the region. With support of enthusiastic persons involved in the Pantanal two preparatory workshops, a symposium and an additional workshop in Bolivia have been held.

A preparatory workshop in Cuiabá (Mato Grosso) with 37 participants (representing Paraguay, Bolivia, Mato Grosso and Federal Government of Brazil) has been held making use of a SWOT framework (Strengths, Weaknesses, Opportunities, Threats). A second workshop has been held in Campo Grande with 35 participants (representing Mato Grosso do Sul, Paraguay and Federal Government of Brazil) in April 2006. Both workshops were based on country reports for each country and discussed the problems and opportunities for the future.

The documents produced here have been the basis for the Campo Grande symposium in July 2006, where 82 participants from Brazil, Paraguay, Bolivia, Germany and the Netherlands have been discussing the SWOT analysis and turned this into a research agenda. During this Symposium use has been made of interactive computer maps for discussion of localised problems as well as for identification of spatial relationships. Observers were present from the EU representation in Brazil, UNESCO, the Dutch embassy and the US embassy.

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<sup>1</sup> As the website is temporarily out of function, the documents can be obtained through the coordinator. The website will be restored as soon as possible and this information will then be updated.

The consortium was aware of the social situation in the region as well as developments in the political arena. The symposia and workshops had to be organised in periods that this was politically and socially convenient. That meant that periods of holidays in Latin America, Carnival and elections had to be avoided. All politicians and other important representatives (representing, among others, Embassies, EU representatives, larger NGOs), the press and television have been kept informed.

In this period of 18 months of the project, the political situation was changing in Bolivia as a result of the elections and the referendum on decentralisation. As the civil servants and politicians with whom appointments had been made changed position, special visits had to be made to Santa Cruz de la Sierra and La Paz. Nevertheless, the situation in Bolivia was rather fluid at the time of the symposium. This made the Bolivian participants decide to organise an additional workshop in Santa Cruz de la Sierra to validate results and enable engagement with a broader set of people and groups. It was organised with participation of 20 local organisations (public sector, private sector and research groups) on 7 November 2006.

The final results have been presented by representatives from governments and NGOs from the three countries involved as well as the European researchers on 24 April 2007 in a workshop in Brussels to representatives from the European Commission and the Embassies of Brazil and Paraguay. The presentation of the research agenda has been done by the regional partners in the project as they are considered to be best placed to speak for the region.

Meetings have been organised to inform potential partners and interested parties (not complete):

- Federal Government of Brazil, Ministry of Environment, Programa Pantanal
- Federal Government Ministry of Science and Technology (FP7 Contact)
- Agência Nacional de Aguas (Brazil)
- Delegation of the European Union in Brazil, Environmental Department
- Embassy of the Netherlands in Brasilia and La Paz
- Environmental Agency of Mato Grosso (SEMA), Cuiabá, Brazil
- Environmental Agency of Mato Grosso do Sul (IMA-P) Campo Grande, Brazil
- Environmental Agency of Paraguay (SEAM), Asunción, Paraguay
- Ministry of Environment of Bolivia La Paz, Bolivia
- Department of Hydrology La Paz, Bolivia
- Embassy of the Netherlands in La Paz, Bolivia
- Environmental Department of the Prefecture of Santa Cruz, Bolivia
- Brazilian Embassy in Brussels
- Telephone contact with the Paraguayan and Bolivian Embassy in Brussels
- WWF Brazil, Bolivia, Paraguay, The Netherlands, Germany
- The Nature Conservancy, Brazil
- Conservation International, Brazil
- Fundación dos Amigos del Museu Noel Kempff (Bolivia)
- Various regional NGOs in the field of environment, agriculture and water management in Brazil, Bolivia and Paraguay.

## **Results and Outcome**

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The project produced country documents for the three countries, analysing the political and institutional situation and results of the SWOT analysis. These documents have been produced in Spanish, Portuguese and partly in English. Based on these country-focused documents the symposium resulted in a document with priority actions for the region. Sustainable management of natural resources requires an innovative way of acting with respect to safeguarding economic development in a restricted biosphere. It was concluded that there is a need to develop integrated analytical approaches to cope with the complexity and the inherent uncertainty of the natural system at the scale of the UPRB and the Pantanal. Consequently, it was concluded that it is imperative to promote research activities focusing at filling these gaps, as well as to provide tools to help making decisions such as Decision Support Systems (DSS). This can allow stakeholders and decision makers to make well-balanced decisions, meeting the challenges of the integration of resource use and natural resources management for future generations.

The Research Agenda links river management in different countries and across borders. Research therefore has to aim on integration of hydrology and ecology into integrated river organisation and management, including economic, social and institutional aspects. River systems in the Pantanal need integration and a cooperative

management approach, which can contribute to the development of regional and international coordinated knowledge basis. The Research Agenda has been made to:

- Focus objectives and guidelines for sustainable water management on the key processes in river systems, including the role of flooding;
- Emphasise the role of stakeholders, socio-economic developments, national water resources legislations, policies and policy options in the countries involved;
- Address research questions that link ecological river processes and socioeconomic consequences into an institutional environment for river management, including the interests of stakeholders.

The Research Agenda for the region has been formulated based on the outcomes of the INREP project. Within the major themes desirable actions have been formulated to focus the action and research question. The following issues have been presented as major themes:

1. *Environmental impacts*: diagnosis and remediation; this includes the Hidrovía of the Paraguay River and the role of the Pantanal for the climate of the region and the Plata Basin under changing climatic conditions. This issue can become a major case for conflicts but also for environmental and climatic deterioration of the region. The Hidrovía Paraguay is part of the Hidrovía Paraguay-Paraná navigation project that is considered by the governments of Argentina, Bolivia, Brazil, Paraguay and Uruguay to be the infrastructure backbone of plans for integrating the regional economy. However, the Pantanal is also the most important evapotranspiration window in a region where desertification and salinisation are potential threats. The participants concluded that a better navigable Paraguay River can be especially of interest for transport routes from and to Bolivia. Until now, all studies and evaluations have been done by parties that are thought to have an interest in the development or in the conservation of the *status quo*. A study towards the development of the Paraguay as a waterway is, however, complex and includes international political, economic, hydraulic, hydrological and ecological aspects. A rational way to help resolve the debate between *status quo* and pro-Hidrovía parties is through hydraulic modelling of the river, with hydrological modelling of the river basin, and an analysis of the land use, biodiversity and policy consequences under supervision of an independent steering committee. The participants concluded that analysis of the function of the Pantanal and the UPRB for the regional climate and its relation to climate change, biodiversity, agriculture and productivity of the Cerrado and the Chaco regions are important issues in the decision making on its future development of Latin America.
2. *Assessment and mapping*; this includes the international cooperation in a monitoring system and the exchange of data for the whole of the UPRB that is crucial for the understanding of human influence on the ecosystems and can promote international cooperation in the region. It was concluded that setting up a monitoring system and the exchange of data for the whole of the UPRB is crucial for the understanding of human influence on the ecosystems and can promote international cooperation in the region. Building a database requires political agreement between the regions and states involved and should include institutes which can take the responsibility to act as coordinating body. This means that a cost-efficient monitoring system should be developed, combining enhanced process understanding, state of the art modelling, the necessary new technologies for *in-situ* measurements adapted to the frequency of processes and changes, integrating measurements of chemical, biological, ecological parameters and climatic parameters at scales (temporal and spatial) of relevance to water policy of the UPRB. Links can be sought with GEO (Global Environmental Observation) and EUWI-LA (European Union Water Initiative – Latin America).
3. *Sustainable natural resources management*; which includes the special way that wetlands have to be managed by farmers, fisherman cost-benefit analysis and other and land as well water quality maintenance essential for the Pantanal. Sustainable land and water management is part of all three country reports and the participants all concluded that it needed to apply legislation, have incentives, guidelines and integrated planning of land use. Farmers and land users should learn that the catchments they work and live with are vulnerable to their activities, but that methods exist to maintain sustainable management practices when regarding certain policy and management principles. Sustainable land and water management requires legislation, incentives, guidelines and integrated planning of land use. Farmers and land users new in this area should learn that the catchments they work and live with are vulnerable for their activities. But there are methods to maintain a sustainable management practice when regarding certain policy and management principles. Moreover, treatment of urban and industrial wastewater is essential for maintaining the function of the Pantanal. A costs and benefits study can be carried out in this respect to solve the equation: economic growth with reduced environmental impacts and social conflicts. As possible research activities are mentioned among others studies on best practices or enterprises that are environmentally, socially and economically compatible, Identification, development and diffusion of productive technologies and sustainable production chains, useful to the UPRB society (pilot projects or demonstrative units) and development of local technologies to promote sustainable agriculture, fishing and tourism;

4. *Governance, laws, institutions and policy*; research into social interaction, stakeholder participation are of utmost importance to understand the complex relations in water and land management, social participation in the process of decision making can long term cooperation and sustainability. Civil organisations can adapt their working programmes to each other and, in this way, better mobilise forces. International and national and regional communications and platforms of NGOs are important to maintain and build a society that can live in a sustainable way. Research on social interaction and stakeholder participation is of utmost importance to understand the complex relations in UPRB promote social participation in the process of decision-making and build platforms for mutual long-term cooperation.
5. *Sustainable development*: diagnosis and solutions; scenario models can help to develop Decision Support Systems being based on different options for management, taking into account the extent of the area, the low density of the population and the predominant natural processes. For decision making in the UPBR and the Pantanal sound scientific arguments are needed, considering the anxieties and wishes of the different stakeholders. To address this issue, scenario models could be developed and Decision Support Systems can be of use. Decisions will have to be based on different options for management in the specific context. Therefore developing scenarios using reliable and integrated models for river management is considered crucial.
6. *Capacity building* is cross cutting the five preceding issues involving the identification of gaps in education, information, technologies, methodologies, institutional frameworks and services and followed by the provision of support to fill the gaps. Sustainable water management is still underdeveloped in this part of Latin America and it needs strengthening, not only for practical management, but also to make decision makers aware of the potential impact of decisions.



The delegation of the INREP project in front of the EC building Square de Meeús after presentation of their results.

### Selected Publications and Papers

- Barbosa Pereira, M.P., J.M. Leeuwestein & R.H.G. Jongman, 2006. Establecimiento de una política conjunta de gerenciamento e de uma agenda de pesquisa relacionada para o Pantanal – INREP, Contribuições para a identificação das Forças, Oportunidades, Fraquezas e Ameaças para o gerenciamento; documento do Bolívia, 28 p. (with Spanish and English translation)
- Barbosa Pereira, M.P., J.M. Leeuwestein & R.H.G. Jongman, 2006. Establecimiento de una política conjunta de gerenciamento e de uma agenda de pesquisa relacionada para o Pantanal – INREP; Contribuições para a identificação das Forças, Oportunidades, Fraquezas e Ameaças para o gerenciamento; documento do Paraguai, 33 p. (with Spanish and English translation)
- Barbosa Pereira, M.P., J.M. Leeuwestein & R.H.G. Jongman, 2006. Establecimiento de una política conjunta de gerenciamento e de uma agenda de pesquisa relacionada para o Pantanal – INREP; Contribuições para a identificação das Forças, Oportunidades, Fraquezas e Ameaças para o gerenciamento; documento do Brasil, 72 p. (with Spanish and English translation)
- Girard P., J.M. Leeuwestein & R.H.G. Jongman (eds), 2007. Research agenda for the Pantanal and the Upper Paraguay River Basin, 12 p. (With Portuguese translation)
- Goede, J., 2007. Water Use and Management of the Bolivian Pantanal. MSc Thesis, Wageningen University, Irrigation and Water Engineering Group, 79 p.

Jongman, R.H.G., J.M. Leeuwestein & P. Girard, 2007. A research agenda for the Pantanal and the Upper Paraguay River Basin. In: Bunce, R.G.H., Jongman, R.H.G., Hojas L. and Weel S. (eds). 25 years Landscape Ecology: Scientific Principles in Practice. Proceedings of the 7<sup>th</sup> IALE World Congress 8 – 12 July Wageningen, The Netherlands, IALE Publication series 4, 521 p.

Moscoso, A., 2006. Taller de acciones prioritarias para la Cuenca Alta del Río Paraguay (región del Pantanal). Instituto para la Conservación de Ecosistemas Acuáticos-ICEA, 7 p.

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