

Guarani Aquifer System Project: Strengths and weaknesses of its implementation

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ABSTRACT

Between March 2003 and January 2009, with a budget close to USD 27,000,000, the Project for Environmental Protection and Sustainable Development of the Guarani Aquifer System (*GASP*), was implemented by Argentina, Brazil, Paraguay and Uruguay. These countries share one of the most important groundwater reserves in the world, covering an area of over one million km² with a population of approximately 90 million inhabitants. The magnitude and characteristics of the project, the various levels of knowledge and expectations of different sectors from the involved countries had an impact that went beyond the scientific-academic domain. Thus, the project aroused the interest of general society, motivating analysis, debate and sometimes questioning the implementation process. Considering the significance of the project and its pioneering nature in the field of cross-border groundwater at a regional level; the relevant aspects of the implementation of the *GASP* in Argentina were analyzed as "*lessons learnt*", pointing out strengths and weaknesses of its implementation. The concepts expressed in the document do not constitute an official position of the Republic of Argentina; but a display of the personal opinion from the authors who have taken an active participation in the project. Among other relevant matters, it strikes as evident that a cross-country project does not necessarily imply symmetry of knowledge, use, strategic importance and appraisal among the countries that share the resource. This scenario is currently repeated between the provincial governments of Argentina as a result of the Federal System of Government. It has also been demonstrated that long-standing projects of ambitious targets, dependent on top-level political decisions are affected by government's rotations. Therefore, it would be desirable to undertake initiatives of a lower scope, with more austere but attainable objectives, that entail a shorter run time that would avoid or mitigate these situations. With the experience that "urgent situations prevail on important ones", it is understood that: The end of international financing and the "preventive" character of the project, constitute risk factors for the continuity and realization of the objectives originally raised. In terms of optimization, we should achieve a constant coverage to avoid interruption and / or postponement of objectives.

Key words: Cross-border groundwater /Guarani Project / Lessons learnt

1. INTRODUCTION

The Project for Environmental Protection and Sustainable Development of the Guarani¹ Aquifer System (*GASP*) was created as a tool to support the governments of Argentina, Brazil, Paraguay and Uruguay, as well as for the establishment of a management framework of the Guarani Aquifer System (*GAS*), which includes technical, institutional and legal aspects, required for its protection and sustainable use, (OAS, 2009).

Its implementation began in March 2003 and ended in January 2009 following the guidelines and procedures defined by the Global Environmental Facility (*GEF*), the World Bank (*WB*) and the Organization of American States (*OAS*). The project allowed the consolidation of technical and

¹ The name Guarani derives that its extension coincides roughly with the great nation Guarani, native people of the region.

scientific knowledge, public participation, education, communication, diffusion and the establishment of a coordination and management proposal of the transboundary aquifers.

Figure 1 shows various time-periods associated directly or indirectly to the development of *GASP*. Even though execution was estimated to take place in four years, some activities were developed in more than 10 years, during which multiple government renovations that influenced the progress of *GASP* occurred.

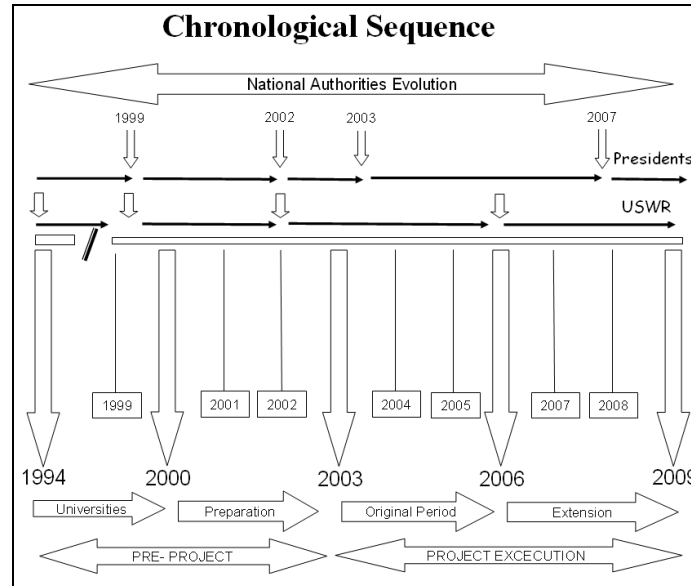


Figure 1 Activities related to the GASP

The *GASP* did not focus exclusively on groundwater research, but expanded its analysis to aspects related to the institutionalization, legislation and administration of the transboundary resources that constitute the necessary pillars for an efficient management.

In 2004, Foreign Office's authorities from the countries involved created an *ad hoc* group with the aim of elaborating an "agreement project" that could be used as a regulatory and institutional framework of the *GASP*. The group was in session until the end of 2005 and developed an agreement project that was finally not considered during the implementation period.

1.1. Organizational Structure

Water Resources, Environment and Foreign Affairs' Offices of Argentina, Brazil, Paraguay and Uruguay created the Project Steering Committee (*PSC*), with the support of a Collegiate Coordination (*CC*), made up of National Coordinators (*NC*). The administration of *GASP* was carried out through a General Secretariat (*GS*) that had technical and administrative supervision roles.

The National Units of Implementation of the Project (*NUIP*) were composed of public officials from each country with expertise in water resources, environment and foreign affairs. In Argentina due to the government's Federal System, the provinces have the head domain of the resources; therefore representatives from the involved provinces - Misiones, Corrientes, Entre Rios, Formosa, Chaco and Santa Fe - were also integrated. The organic structure was completed by Local Government Committees (*LGC*), established in the pilot project areas. Argentina and Uruguay shared the Concordia (Argentina)-Salto (Uruguay) Pilot Project.

1.2 Budget

The total cost of USD 26.760.000 was composed of 13.4 million from the *GEF* non-refundable fund, 12.1 million as matching funds to what was provided by countries and 1.26 million from cooperation agencies: International Atomic Energy Agency (*IAEA*), Geological Survey of Germany (*BGR*), and the Bank Netherlands Water Partnership (*BNWPP*).

In the Project Implementation Plan (*PIP*), seven components of compensation were defined: 1) General Studies 2) Nodes / *SISAG* / *TDA* / *SAP* 3) Public participation and diffusion 4) Follow up and monitoring 5) Pilot Project 6) Geothermic potential and 7) Operational expenses. Argentina committed 1.923.650 USD and complied with it through i) taxes ii) acquisition and provision of services or public works, iii) operational expenses, and iv) Training activities. No compensations were identified in the form of funds' transfers.

There were differences connected to the increasing compensations' costs by budget's component in the *PIP* and those entered through the system implemented by the *GS*. These disparities derived from the underestimation or overestimation of the calculations at the preparation stage. The integration of the provincial operating costs also added variations to the initial budget. This led to an adjustment of the figures assigned to the *PIP* during implementation.

1.3 Legal and institutional aspects of Argentina

As a result of the Federal System of government adopted by Argentina, several jurisdictional levels are to be found: being national and provincial the most significant ones. Provincial states have the domain and jurisdiction over water resources and, consequently, they define their regulations, laws and administrative organizations.

The existence of multiple institutions with the competence to interfere in water resources – at a national, federal, regional, provincial and municipal level – results in a fragmentation and overlapping of the resources management. In addition, given the high percentage of water resources with an interprovincial nature, the national government has fostered the creation of watershed organizations to mitigate the dissolution of the water system and promote an integrated management of water resources.

The six provinces connected to *GAS* have diverse legislations and an organization with various levels of efficiency in its implementation. However, in spite of administrative differences, important similarities were found which allowed the creation of coordinated management policies.

2. LESSONS LEARNT

In the belief that "every experience is valid, even if bad, so as to not repeat it" we listed as *lessons learnt* the strengths and weaknesses related to the project's implementation.

2.1 Strengths

- The initial will declared by the four countries involved in the preparation and implementation of the *GASP*.
- Advances in groundwater knowledge of the *GAS*, were documented in more than ten thousand legal pieces.
- The hierarchical organization of the transboundary and interstate groundwater resources prompted a legal, institutional, national and regional development in water resources matters.

- The search for participation and social consensus during the implementation of the project.
- The consideration and participation of native populations in the *GASP*.
- The simultaneous regional and local levels of analysis. The regional level of analysis allowed a global and integrated vision while the pilot areas resulted in viable tools for coordinated work and the comprehension of crossborder local topics.
- The creation and operation of the *PSC*, composed of senior authorities, resulted in an efficient mechanism for the exchange and analysis of information. It also became an agile tool to make decisions and to search consensus on the guidelines of the project among the *NUIPs'* representatives.
- The integration of a local leader (facilitator) from the beginning of the project strengthened the activities developed in the pilot areas.
- The possibility of hiring an assistant to reinforce the activities of the National Coordination.
- The training of regional technicians and professionals in matters related to the knowledge and management of groundwater, particularly in the *TDA* and *SAP* methodologies.
- The adoption of an internship program allowed access to a specialized training to a large group of professionals from governmental institutions.
- The creation of specific university and citizenry funds favored the development of scientific, technological and social activities.
- The creation and implementation of a diffusion plan of activities for the *GASP*.
- The co-financing of the venture through a compensations' system.
- The provision of equipment to allow the continuity of the *GASP's* activities.

2.2 Weaknesses

- Changes of representatives at the *PSC*, which generally derived from government's renewals in each country, resulted in delays and discontinuities in the development of the project.
- The creation of the *NUIP* did not take into account the federal system of government. Argentina had to accommodate its structure to incorporate the provinces which have domain over water.
- The organizational structure presented during the project showed the actors in a static way, which made difficult to identify the relationships among them (Fig. 2a). It is considered that the diagram in Fig. 2b would symbolize the functional relationship amid actors, as well as presenting the dynamics of the *GASP* in a more realistic approach.

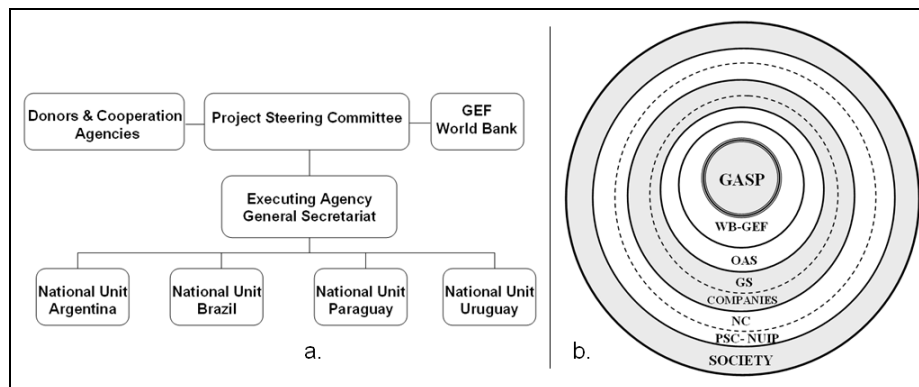


Figure 2 Functional relationships of *GASP's* actors.

- The countries' limitations in the control and supervision faculties over the project's actions.
- The hydro-geological slant in the working team at the *GS* did not contemplate interdisciplinary aspects enunciated in the projects' goals.

- The delay in the implementation of the communication and diffusion plan, gave way to the propagation of the so-called "hidromitos" (groundwater myths) in detriment of the *GASP*.
- The delay in the development of the *GAS Information System, SISAG*, conditioned its full operation during the execution period.
- Modifying the due dates originally planned by the *PIP*. The extension of the implementation period, subject to a fixed budget, resulted in the reduction of planned activities, expanding administrative expenses in detriment of the committed actions.
- The incapacity to fulfill the formal goals of the project during the implementation period. The initial will of the countries was not legally reflected in a multilateral agreement that would allow the introduction of a permanent mechanism of coordinated management of the *GAS*.

Regarding the weakness presented, it is possible to highlight:

- Except for the first and the last, all weaknesses could be easily corrected.
- The strengths and weaknesses resulting from the *GASP*'s implementation, referred specifically to the Republic of Argentina. However, they could also be valid for the other participant countries.

3. EVALUATION

After listing the strengths and weaknesses of the implementation of the *GASP*, in a descriptive form, it is relevant to complement such an approach through an assessment analysis.

Failure to agree on the adoption of a management framework during the implementation period would, "a priori", cause to describe it as unfinished in regards to a formal compliance. Nonetheless, it is believed that given its pioneer and preventive nature in the field of transboundary aquifers, in addition to its regional magnitude and the obtained scientific and technical advances, it would be possible to evaluate the implementation process as a whole.

Based on all of the above, we firmly believe in the success of the *GASP* and the possibility of replication in other regions (*Giraut et. al., 2009*). We point out some of the lessons that its implementation has left:

- The model of the implemented project, based on academic support administered by governmental agencies with broad participation, diffusion and awareness of the public and private sector, resulted appropriate for the goals of the *GASP*.
- The implementation design of the *GASP* had flexible and agile mechanisms that allowed making unexpected adjustments in the *PIP*.
- It was observed that long term projects with ambitious goals, dependent on political decisions are of difficult fulfillment in the implementation times.
- It would be advisable to initiate programs with more austere objectives, in shorter-terms so as to achieve the proposed goals and to avoid delays as a result of multiple government changes.
- It was understood that transboundary resources do not necessarily imply equal knowledge, use, strategic importance, evaluation, etc. among the countries sharing the resource. This scenario was also evident among the provincial states of Argentina, as a result of its Federal System of Government.

4. CONCLUSIONS

The *GASP* showed that a *Transboundary Aquifer Management System* requires the implementation of actions of diverse nature:

The initial challenge is to combine the will of the different members to achieve a common goal, respecting existing differences and moving forward gradually on the coincidences over the management of the transboundary resources.

Use a "top - down approach" to put actions into practice through the strengthening of the institutional capacities, legal reconciliations, and the adoption of common political decisions. In addition, a "bottom - up approach" fostering participatory systems through education and the culture of water which have been developed by the *SAP*.

The implementation of the project demonstrated the political will of the four countries to work together during six years in order to achieve the protection and sustainable management of the *GAS*, independently of the subscription to a multilateral agreement during the implementation period.

Even though the preventive nature of the *GASP* constituted a virtue during its implementation; it could become a disadvantage for the concretion of actions since there is a risk of postponement for urgency matters, dependent on each of the countries' reality.

5. ACKNOWLEDGEMENTS

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LIST OF ACRONYMS

BNWPP – Bank Netherlands Water Partnership Program
BGR - Geological Survey of Germany
CC – Collegial Coordination
NC – National Coordinators
GAS – Guaraní Aquifer System
GASP – Project for Environmental Protection and Sustainable Development of the Guaraní Aquifer System
GEF – Global Environment Facility
GS - General Secretariat
IAEA - International Atomic Energy Agency
NUIP - National Units of Implementation of the Project
OAS – Organization of American States
PIP – Project Implementation Plan
PSC - Project Steering Committee
SAP – Strategic Action Plan
TDA - Transboundary Diagnostic Analysis
SISAG - Information System on the Guaraní Aquifer System
USWR - Under-secretariat of Water Resources
WB - World Bank