Track 4

Ethics, Social Responsibility and Environment

Cultivating Good Water Program – Participative Management for Sustainable Development

ABSTRACT

Itaipu Binational hydroelectric dam aims to provide Brazil and Paraguay with clean energy for sustainable growth. In 2003, in order to expand its mission, the company improved corporate actions related to social responsibility by establishing the Cultivating Good Water program (CAB – *Cultivando Água Boa*).

Given the size of the project, the Higher Institute of Administration and Economics (ISAE) conducted a detailed study on the program in 2012, with a focus on its sustainable management model and the factors permeating its portfolio.

The program has legitimized the set of actions that promote social development in environmental preservation and recovery, besides the generation of income for the communities. Thus, the results of this article suggest that the CAB's performance and importance is acknowledged by the society in the region with respect to the sustainability and governance of the activities developed.

Keywords: management, transformation, sustainable development

INTRODUCTION

The Itaipu Binational hydroelectric dam has the strategic objective of implementing the mission established in 2003 with the Cultivating Good Water program (CAB). Itaipu's initiative has a systemic and participatory water management model focused on the environment and communities around the Paraná Watershed 3, where Itaipu power plant is located.

Currently, the greater demand for food, the rapid urbanization and climate change exert increasing pressure on water resources, requiring a new way of thinking about water management and global energy. According to the World Water Development Report (UN, 2012), whose main theme was water and energy, it is estimated that in 2030 the global population will need 35% more food, 40% more water and 50% more energy.

There is an interconnection consolidated between these two elements, once matters related to water impact the energy industry. In order to rethink the management approach for these resources and sustainable development, it is necessary to advance governance actions in water resources and energy – and also to be aligned with stakeholders to plan and be prepared for extreme hydrological climatic events.

In Latin America the quality of services varies greatly between rural and urban areas, and also between countries (UN, 2012). 40 million people still lack access to quality water, and nearly 120 million people do not have appropriate sanitary facilities.

In Brazil, we can mention the water conflict that São Paulo city has been experiencing, caused by a crisis in water supply due to severe drought periods and to the

water resources management in the region. This crisis has led the city to strict water rationing, resulting in intermittent water supply.

Despite Brazil's privileged situation of having approximately 12% of all freshwater on the planet, serious problems affect the country, such as irregular distribution of water resources and waste at all levels of society (ANA, 2002).

Considering these issues, the Cultivating Good Water program has developed an innovative management model – which can be used by complex programs and projects –with focus on the environment and the communities involved.

Itaipu's actions relating to social and environmental responsibility have expanded and diversified, creating a landmark in corporate transformation with the actors involved in CAB.

In this study, the causes that originated CAB, the evolution of the corporate strategy resulting from this process, the systemic and participative management model and the results achieved were examined.

CULTIVATING GOOD WATER PROGRAM

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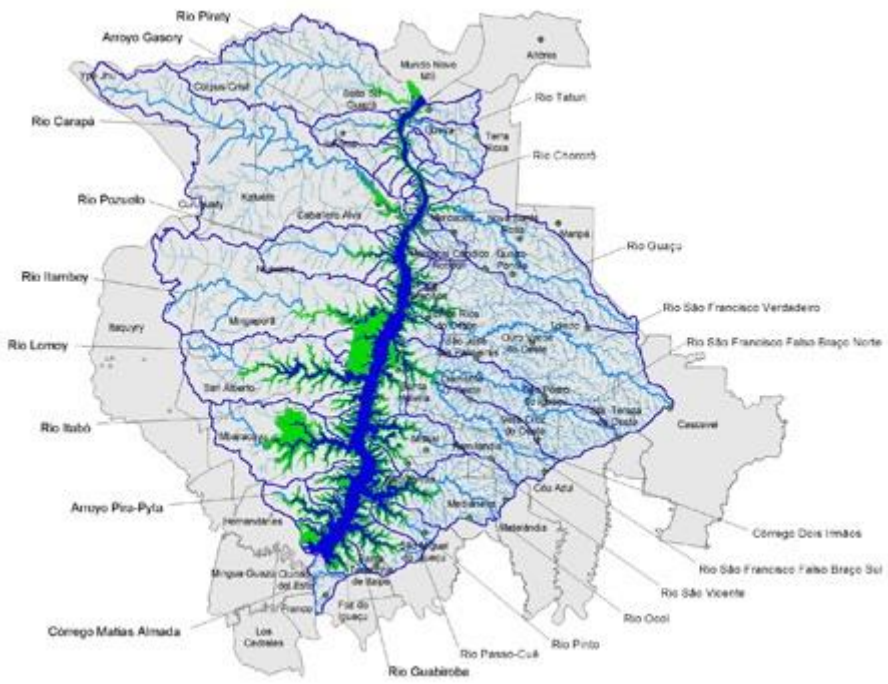
Based on the data presented, there is a need to achieve sustainable development by raising awareness and having different attitudes towards stakeholders.

Cultivating Good Water (CAB) is developed in the left margin of the power plant reservoir, in the Paraná River Watershed part 3 (BP3), which covers 29 municipalities. Through various programs and actions, CAB focuses on integrated regional development in

the area of influence – in the BP3. On the Paraguayan side, there are eight municipalities in the region of the watershed of rivers Carapá and Yaboty, where a pilot project of the management model has been developed, called *Cultivando Y Porã*.

According to the company, the region has approximately one million inhabitants and 800 thousand hectares of area in 29 municipalities: Altônia, Cascavel, Céu Azul, Diamante D'Oeste, Entre Rios do Oeste, Foz do Iguaçu, Guaíra, Itaipulândia, Marechal Cândido Rondon, Maripá, Matelândia, Medianeira, Mercedes, Missal, Mundo Novo, Nova Santa Rosa, Pato Bragado, Quatro Pontes, Santa Helena, Santa Tereza do Oeste, Santa Terezinha de Itaipu, São José das Palmeiras, São Miguel do Iguaçu, São Pedro do Iguaçu, Terra Roxa, Ramilândia, Toledo, Vera Cruz do Oeste e Ouro Verde do Oeste.

Map of the region served



Map of municipalities served

CAB counts on great participation of society, including: Itaipu representatives, several municipalities, state and federal agencies present in the 29 municipalities, cooperatives, rural producers, universities, companies, schools, indigenous communities, local communities, civil society organizations, NGOs, fishing communities, etc.

The Cultivating Good Water program consists of 20 interconnected programs, 65 actions of socio-environmental responsibility and more than 2,000 partners focused on the nature's planning unit, which is the watershed. Thus, it seeks to preserve the quality of water in the Itaipu Lake, besides enhancing the entity's environmental responsibility.

The main CAB programs are:

Environmental Education: It promotes cultural change in communities, with new values, attitudes and beliefs, within the concept of ethics, care and respect for the

environment.
Watershed-Based Management: Management model adopted by CAB to perform actions in the micro-watersheds of Paraná Watershed 3 (BP3). The implementation of the program begins by selecting a micro-watershed, then meetings are held with the community and its leaders to raise awareness and give information on the CAB, and, finally, the management committee is created.
Territorial Information Management: With the implementation of the technical register, it maintains, offers and updates the collection of cartographic and geographic information of Itaipu's region of influence on the quality of waters, sedimentology, production systems and environmental condition of rural properties, subsidizing the decision making process for the adequate development of territorial and environmental management.
Itaipu Renewable Energy Platform: It promotes the efficiency of the region through alternative sources and replaces fossil fuels with clean and renewable sources.
Sanitation in the Region: It proposes models and strategies to be incorporated by municipal administrations in the Paraná Watershed 3. Thus, the issue of unsanitary conditions and environmental contamination by effluents is approached as a whole.
Medicinal Plants: It rescues the rich heritage of medicinal plants in the BP3 region, promotes the importance of phytotherapy medicines, and offers an alternative source of income for organic farmers.
Environmental Monitoring and Assessment: Data collection to obtain information about a characteristic and/or behavior of an environmental variable.
Sustainable Rural Development: It allows farmers to review their production model and replace them with sustainable models. It offers support and knowledge through participatory methodologies and options to develop the production chain.

Sustainability of Vulnerable Segments: It promotes democratic rights and sustainable development for sectors excluded from society.
Fish Production in Our Waters: It promotes social inclusion, supports fishermen and improves the quality of life of families working on BP3 waters. The program develops research in aquaculture and promotes training in fish management for fishermen and producers.
Biodiversity Our Patrimony: It ensures the perpetuation and genetic variability of the flora and fauna species in BP3.

CAB was designed on the basis of the Earth Charter and other important global movements, such as Agenda 21, Millennium Declaration, Treaty on Environmental Education for Sustainable Societies and Global Responsibility, Globally Responsible Leadership Initiative, Global Compact, and UN-Water. In addition, CAB includes a set of proposals for the new Sustainable Development Goals (SDGs) agenda to be achieved by 2030.

The Cultivating Good Water program integrates diverse sectors of society to restore river sources and better manage water resources, thus promoting sustainable development. This combination happens through food and energy production, public supply, and incentive for leisure and local tourism, advancing inclusion with the innovative actions described before.

In order to mitigate and correct environmental liabilities from the construction of the Itaipu power plant, CAB works with the community to change their values with respect to sustainable actions and to create a culture of shared, integrated and participatory

performance. Thus, the legitimacy of the Cultivating Good Water process is notorious for turning communities into actors that influence and are influenced by the program's actions.

One of the main activities is to restore micro-watersheds, beginning with river sources, through the Watershed-Based Management program, which works with 206 micro watersheds. CAB also performs some actions for the sanitation of environmental liabilities. The main ones are:

- Protect water sources
- Plant and protect riparian forests (within 50 meters radius of river sources and 30 meters width on each margin along the courses)
- Install fences to protect riparian forests, limiting the area for agricultural activities and preventing cattle from invading riparian forests and river courses
- Implement community suppliers to preserve the water quality in rivers and streams
- Adapt rural roads to prevent erosion, which carries pesticides and soil fragments to watercourses
- Terracing[1] of agricultural soils, allowing the correct drainage of rainwater.

Watershed recovery and other CAB activities developed in partnership with the population of the 29 municipalities are essential for the promotion and recognition of the program.

[1] Terracing is a technique to conserve soil and control water erosion, reducing soil and water losses by erosion.

Management Model

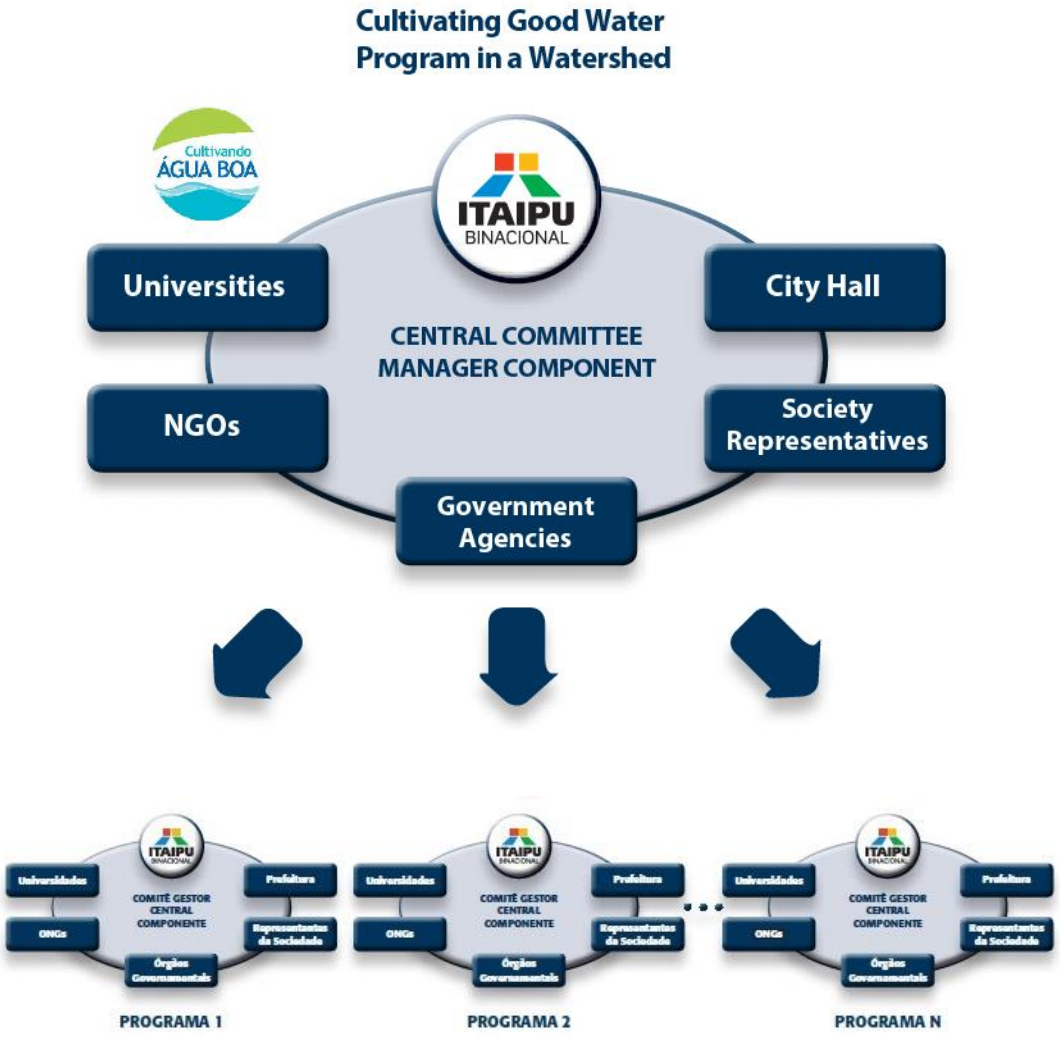
In order to be effective, a program of social and environmental responsibility has to be based on a process of social change, promotion and increasing opportunities in a society[2]. Thus the Cultivating Good Water program promotes a systemic combination, through watershed-based management, which encourages the creation of public policies and the active participation of multiple actors with ethics and transparency in every step. They are often managers (members of the management committee) and, at the same time, members of the work team or beneficiaries of the program.

Understanding that the community is the protagonist in CAB, in each municipality the program is implemented in steps that enable the construction of a network of support and integrated action, according to the following methodology:

- Creating the internal management committee: Structuring programs and actions to be offered in the chosen region.
- Presenting CAB to the representatives of BP3 municipalities: Explaining the program for local leaders to analyze and approve its implementation.
- Presenting CAB to the community and selecting the micro-watershed: The process of constructing and implementing the program with the community was carried out in 2003.
- Selecting the watershed: It starts with a transparent and ethical dialogue with the community, authorities and local leaders about the importance of conserving water resources.

[2] BUARQUE, 2002 apud ARRUDA FILHO et al, 2012.

- Raising stakeholders' awareness: Itaipu holds meetings with authorities, leaders and owners from both margins of the micro-watershed and offers to register their properties and facilities according to environmentally correct legislation and practice.
- Creating management committees: A management committee is created in each city – which can create committees for implemented programs with Itaipu representatives and various local actors. Both committees have the same structure, as shown in the next figure:



ARRUDA FILHO *et al*, (2012, p. 34).

- Technical structuring and definition of necessary partnerships: Define and establish partnerships to implement component programs in each municipality.
- Consolidation of partnerships and involvement of the organized society: Establish new alliances with political entities.

- Workshops of the Future: Inspired by Paulo Freire's methodology, the activity is divided into three stages – Wailing Wall, Hope Tree, and Road Ahead. It is a participatory system of diagnosis and planning of actions for recovering environmental liabilities.

FRIEDRICH, (2015).

- Waters Compact: The event in which all participants sign the commitment to perform recovery actions, with the mystical representation of water, fire, earth and air.

FRIEDRICH, (2015).

- Agreements: They are formal and legal instruments of participative management between Itaipu and other institutions (governmental, private sector, universities, etc.), defining the institutions' participations and attributions in the works of correcting environmental liabilities and building the micro-watershed sustainability.
- Adjusting partnerships: Agreements related to the participation and contribution of every CAB partner .
- Workshops of the Future in the Present: This action is carried out during and after resolving environmental liabilities, when the workshops are held, in order to ensure

that the results achieved are preserved and improved by means of a permanent joint action.

RESULTS AND DISCUSSIONS

Through the Cultivating Good Water program, Itaipu promotes partnerships with the community to advance sustainable, touristic and technological development in Brazil and Paraguay. CAB contributes to resolve the main problems identified by Itaipu during the monitoring of water (the company's raw material) in the BP3, such as sedimentation, deforestation, pesticides, proliferation of algae, aquatic plants and mollusks – including some toxic ones that degrade the reservoir environment, impacting its ecosystems.

In addition, CAB has provided Itaipu and society with an innovative management model for recovering micro-watersheds and a new perspective of public policies that had not yet been adopted in Brazil. The Cultivating Good Water program has aroused the interest of several countries that sent their representatives to meet the CAB, as shown in the figure below.

The challenge is planetary, so the Cultivating Good Water constantly seeks to share and replicate their methodologies, actions and results. FRIEDRICH, (2015).

Another highlight in CAB refers to the territorial development provided to the BP3 community by generating inclusive businesses, as reported below

- Creation and expansion of technical assistance and rural extension companies to help small farmers in the production of agroecological products, diversification of productive activities, value aggregation and sales.
- Coordination and training of 3 cooperatives and 25 associations that act in the collection, sorting and sale of recyclable materials.
- Creation of the cooperative of producers of medicinal plants, which grows, processes and sells medicinal plants
- Installation and operation of the Extracts and Tinctures Production Unit, with capacity of 90 tons.

- Sustainability of Indigenous Communities – improving their quality of life by implementing 60 new homes and rural sanitation.
- Creation and application of 22 associations and 3 cooperatives of family farmers involving 1,200 families in food production and sales.
- Support in the implementation of 10 agro-industries of family farming, municipal sales centers and regional fairs.
- Generation included business and income in small rural properties with the constitution of 14 associations of organic producers, research, technical support, training, production and sale of organic products.

CONCLUSION

After the presented study, it is clear that the Cultivating Good Water program brings improvement to the related community by means of its actions, advancing local development for the actors – the real protagonists, responsible for its success since 2003.

This success is reflected in the program's actions of replicability that are already under study in Latin and Central American countries. The Community of Madrid has also shown interest. In Brazil, CAB will be replicated in the state of Minas Gerais, where it is being treated as a state public policy, starting in the city of Varginha.

The Cultivating Good Water Program was awarded by the UN in March this year, as better management of water resources in the world. The CAB competed with 40 projects from all continents in the 5th Edition of the Water Prize for Life in 2015, and won first place in the category "Best Practices in Water Management".

At the same time CAB contributes to solve the main environmental problems identified by Itaipu through water monitoring (such as sedimentation, deforestation, pesticides in Paraná Watershed 3), it also legalizes an instrument that promotes the involvement of Itaipu and the society in the creation of a sustainable system. By engaging stakeholders and creating municipal management committees, CAB promotes civil participation to preserve natural resources and advance the region's sustainable development.

The results of this article suggest that CAB is not limited to the mitigation of environmental liabilities, but also involves the community's sustainability, promoting change through water management.

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APPENDIX 1

INTERVIEWS

1. Silvana Vitorassi - Division Manager Environmental Education Itaipu Binacional. Interview on 03.19.2015, Foz do Iguaçu.

2. Nelton Friedrich - Director of Coordination and Environment. Interview on 03.19.2015, Foz do Iguaçu.