

## **Capacity building for climate disaster risk management at local level in Pantanoso watershed in Montevideo: Uruguay**

### **Description**

Montevideo is a region with the highest population density in Uruguay; with just over 1,300,000 inhabitants (INE, 2011) and has the one of the smallest surface areas (530 km<sup>2</sup>). Mildly undulated plains and reasonable water resources characterize its geography. There is a wide coastal strip by the River Plate with arches of beaches of great recreational and tourist value; Santa Lucía river in the west of the department that supplies the region with drinking water and three urban watersheds similar to Pantanoso, Miguelete and Carrasco streams. From an economic point of view, it is the main industrial and commercial activities concentration in the country which has the highest rates of human development and per capita GDP. The Pantanoso watershed in Montevideo was identified as the most vulnerable to threats of intense rains and floods and the area has the highest number of settlements on its banks. Severe meteorological events such as strong winds or intense rains that bring high water levels or floods in some urban watersheds happen sporadically affecting the local population. Both the local population and authorities of the local governments in the watershed have never had specific training in disaster risk management for floods. Therefore, they prepared the necessary skills to be able to handle disasters of the nature.

### **Action taken**

A project for capacity building at a local level for Climate Related Disaster Risk Management which aimed at strengthening the local communities in Montevideo Department on climate change and variability adaptation was implemented. Cultura Ambiental carried out series of activities that significantly contributed to the expansion of knowledge on climate related disaster risk management. The activities were carried out along with the Pantanoso stream watershed in Montevideo Department. The initiative sought to contribute to the creation of exchange networks between neighbours and decision makers, in order to have an effective implementation of local plans of disaster risk management as well as creating a platform for active participation of the local emergency commissions.

A forum to prevent risks for local referral agents was started in order to reduce social vulnerabilities at the municipalities associated to the Pantanoso stream watershed. A preliminary mapping of vulnerable or flood-prone areas and the analysis of issues was done together with the social area of the Zonal Community Centres (CCZs). The initiative was supported by the disaster risk management agencies, the National Emergency System (SINAE) and the Coordinating Centre for departmental Emergencies (CECOED) of Montevideo. These agencies activity took part in facilitating information and expressing the need to create emergency plans by zones. This has set an example and provided continuity to the process within the project which has enabled the development of a methodology of communal work replicable in other zones and urban basins with similar problems.

### **Lessons learnt**

- In addressing the difficulties that affect different sectors of the State while implementing certain requirements in the water resources management, the civil society occupies a key place as a link to the community, a generator of local knowledge and support to the creation of instruments of management.
- Community participation: It is fundamental to identify current spaces for communal participation and to promote its action, encouraging its link to social organizations and the authorities for successful initiatives.

- Lack of shelters in the zone and the deficient conditions to lodge the evacuated population were identified as weaknesses, considering that the only available current facility is the Mercado Victoria which is insufficient regarding bathrooms, water supply and breakages.
- Certain neighbours were identified for their capacities as referents in the zone by delivering information acquired through life experience on the effects of floods and “sudestadas” (heavy storms from the South), with fine knowledge of the families, issues and evolution of the settlements. This source of information is of great value at the time of defining local emergency plans and in order to count on implicated actors.

**Key words:** Disaster risk management/ local disaster risk management/ integrated water resources management/ floods / watersheds / adaptation to climate change/ risk maps/ vulnerability/ communal tools and participation.

## 2.1. Description of the problem

Montevideo is a region with the highest population density in Uruguay; with just over 1,300,000 inhabitants (INE, 2011) and it is one of the smallest surface areas (530 km<sup>2</sup>). From an economic point of view, the main industrial and commercial activities in the country are concentrated and display the highest rates of human development and per capita GDP. It is located in the southern part of the national territory; its average temperature varies between 22 and 23° C in summer and 11° C in winter. The rainfall pattern shows an average precipitation of around 1100 mm per year and seasonal maximum potential evapotranspiration during summer (from December to March) and minimal in winter (from June to September), causing water deficits during summer periods. Severe meteorological events bring high water levels or floods in some urban watersheds which affect the local population such as strong winds or intense rains.

Mildly undulated plains and relevant water resources characterize the areas of geography. A wide coastal strip by the River Plate with arches of beach of great recreational and tourist value; Santa Lucía river in the west of the department that supplies the region with drinking water and three urban watersheds corresponding to Pantanoso, Miguelete and Carrasco streams. These three watersheds are highly urbanized. They are displayed stresses of high pollution levels as they receive industrial, sanitation and solid residues discharges. Besides, having irregular settlements at some areas along their banks, make them particularly vulnerable to heavy rains and strong winds.



The Pantanoso stream watershed spans over 67.2 km<sup>2</sup>, and with a population of 359,344 people living in the basin according to the 2004 Census. Recent reports (*BID-IM, 2012*) show that the Pantanoso stream watershed is one of the three in a more critical and problematic areas of the department. It has 181 settlements that represent 17% of the informal settlements; with 71,137 people having a high percentage of young people. In addition, this watershed is identified as the most vulnerable to the threat of intense rains and floods in Montevideo which increases its vulnerability to severe hydro-meteorological events (the respondents of the aforementioned report indicated that only 55% of people are connected to the central sanitation system. 23% of people reported of flood in their neighbourhoods due to the heavy precipitations and 33% reported that they suffered from the flood whenever it is raining. Therefore, it is paramount to reduce the impact of these events especially by incorporating the disaster risk management as an integral part to the strategies of water resources management within the framework of the action lines for adaptation to climate change and variability.

In order to reduce vulnerabilities at the Pantanoso watershed, it is important to share information with the affected population on the main threats and vulnerabilities, analyse the trend of the events that have caused most impact in the area during the last years. Also recognizing the local capacities and begin to build collective information and spaces for disaster risk management as well as incorporating these into strategies of watershed management defined by the authorities. The high percentage of young population present at the watershed represents an opportunity to incorporate disaster risk management within a prevention approach from a diversity of work modalities.

The project framework created an opportunity for the “Diagnosis and Formulation of the forecast line for a public Institution and strengthening of the National System of Response to Climate Change”. This was implemented by the Spanish Agency for International Development Cooperation (AECID) and non-governmental organizations to perform actions to address climate change at a local level. Within the framework, CULTURA AMBIENTAL executed a project “Strengthening of local capacities for Climate Related Disaster Risk Management “at Pantanoso stream watershed that contributed to the creation of exchange networks among local authorities, the community and educational institutions of the area. It was an effective means for the construction for the resilience of the community, better prepared against new events and fit to integrate itself into the implementation of municipal plans and community spaces for disaster risk management.

This approach is also introduced as a successful case that displays an integrative way of water resources management and flood risk management among local strategies for development.



*Pantanoso stream watershed, Montevideo Department, Uruguay*

## 2.2. Decisions and Actions taken

The activities planned in this initiative were performed within the existing environmental institutional framework at national, departmental and a local level. The conceptual and methodological framework applied follows the guidelines of integrated water resources management and integral disaster risk management.

### 2.2.1 Institutional framework

*At national level*, Uruguay has a plan for integrated water resources management (PlanAgua) and a decentralized National Emergency System in its 19 departments *At the municipal level*, Montevideo has developed instruments for environmental management as the Montevideo Environmental Agenda and the Climate Metropolitan Plan that contribute to designing territorial strategies for the management of climate risks with public participation. It also has the basis for a Plan for the Lower Watershed of Pantanoso stream, which establishes general guidelines and territorial regulation recommendations for the prevailing environmental and urban conditions (housing developments, fillings and modifications of the stream bed), in order to reduce social and environmental vulnerabilities. Regarding emergencies and disaster risk management, the department has a Coordinating Centre for departmental Emergencies (CECOED), from which the response and rehabilitation actions upon a disaster event are planned and executed, evacuating the population and backing up the management of shelters and supplies. *At the municipal level*, municipal Plans for Development in their strategic guidelines forecast the management of emergencies at urban basins as well as the set-up of communal spaces to strengthen the local organization capacity upon these situations have been defined. *At a local level*, the Environmental Commissions of the CCZs and the coordinated work among social organizations with municipal and neighbourhood authorities as well as local referents are fundamental elements for the territorial approach of watershed's diverse features and climate risks management. In particular, the zone of Pantanoso stream involves Municipality A (with the CCZs 14, 17 and 18) and Municipality G (with the CCZ 12 and 13) and various social and community organizations exist within them. However, inadequate sensitization and preparation of the population to confront floods or other severe weather events are recognized make people particularly vulnerable upon new weather related events that may occur. Likewise, the referents from CECOED are involved in affected population and rehabilitation.

### 2.2.2 Conceptual and Methodological Framework

This experience is based on two conceptual frameworks: the integrated water resources management and the local disaster risk management. According to GWP, the *Integrated Water Resources Management (IWRM)* is a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

The *integrated disaster risk management* is “a complex social process that leads to the planning and application of policies, strategies, instruments and measures aimed to hinder, reduce, anticipate and control the adverse effects of dangerous phenomena on the population, goods and services and the environment. It implies integrated actions of reduction of risks through prevention activities, mitigation, preparation, and consideration of emergencies and recovery after impact” (Lavell, 2006).

According to Lavell, in order an experience of *Local Disaster Risk Management (L-DRM)* “the community has to engage in the handling of the local risk and not only through an isolated action of prevention or mitigation of disasters. This is related to the ideas of integrity and of cross-section that the disaster risk management has. At the local level, the risks can hardly be separated and, at the same time,

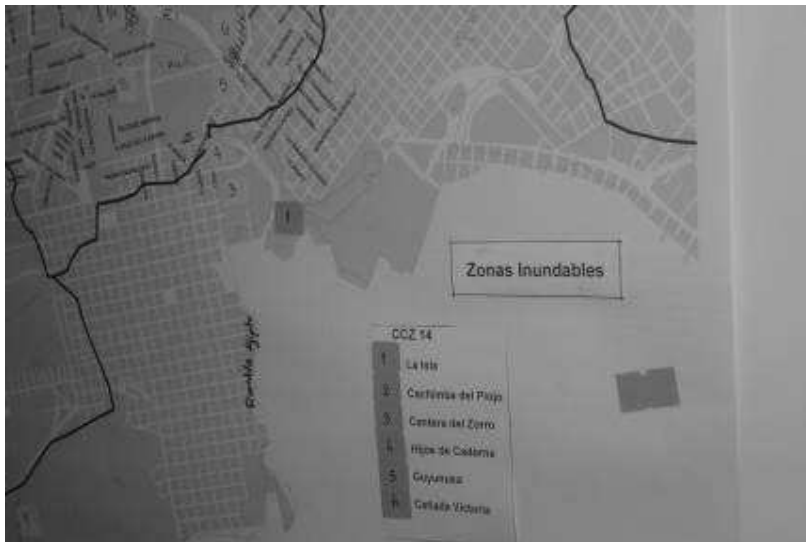
they are related to the agricultural processes, land management, house building, etc.; that is, integral parts of the local development. Thus, in approximate terms, it can be said that L-DRM exists when the local actors (alone or in relation with other external actors) engage in a process that to reduce the level of local risk management. It contributes to establish conditions for reduction to be sustainable such as complete integration in the processes of local development.

The local disaster risk management is based on work with the community implies to sensitize the population, and the analysis of *threats, vulnerabilities and capacities* (TVC) to reduce risks. In this sense, the following instruments were considered: mapping of local actors, qualified informants interviews, analysis of risk perception, and historical analysis of severe events, communal risks maps, capacitation workshops and focal groups.

### 3. Results

The results are summarized below:

- A *Survey of local actors*: social organizations, NGOs, extension programs and local authorities (municipalities, mayors, Zonal Community Centres implicated in the watershed, environmental commission), sports clubs, communal teachers, social networks, the Coordinating Centre for departmental Emergencies, among others, were identified and contacted.
- B *Interviews and meetings with qualified informants*: From the beginning of the initiative meetings were held with CECOED Montevideo, the group on Climate Change of Montevideo and the Technical Team of Environmental Education of the Municipal Government of Montevideo. The area of Pantanoso stream was also analysed and selected as the most vulnerable which required working with the communities. This information was confirmed whilst keeping interviews with local authorities like Municipality A and Zonal Community Centre 17. This allowed incorporating information about communal networks and strengthening links with the new local authorities.
- C *The historical analysis on climate events and institutional response* at the Pantanoso stream watershed. The technical staff analysed historical meteorological information about the department as well as identifying the patterns of rainfall and frequency of severe events. The capacity of departmental and local response to the most recent events in the Pantanoso was analysed with the interviewed referents.
- D *Workshop Training*: Two training workshops were carried out with neighbours, social organizations, local and departmental authorities. It focused on the basics of disaster risk management and the present-day framework of the water resources management in the country and at a local level.
- E *Communal risk mapping*: Taking the map of the Pantanoso stream watershed as a base, work was performed with local referents and technicians of the zonal communal centres. This was to identify the vulnerable zones upon intense rains and strong winds. This map was validated upon the community at a workshop.
- F *Workshop of communal disaster risk management*: The different actors identified in the community were asked, among other proposals, to validate the information of the vulnerability map, and to examine weaknesses, strengths, and future lines of action in order to keep on working from the local level.



*Cartography deployed and information elaborated together with neighbours and local referents for vulnerable areas mapped*

Some additional comments that came forward along the different activities:

- This initiative started a process of implementation of participatory methodologies so as to identify the principal vulnerable areas, needs and capacities perceived by the community and local authorities. The initiative is a key in order to address the main climate threats of the Pantanos watershed (intense rains, floods and strong winds).
- In addition, the need to continue with this line of work, existing in the Municipal Plans for Development was identified the need to work co-ordinately with the community and the education was put forward.
- The lack of enough shelters in the zone and the deficient conditions to lodge the evacuated population were identified as weaknesses. It is important to consider the only available current facility such as Mercado Victoria, which has insufficient regarding bathrooms, water supply and breakages.
- Some neighbours were identified for their *capacities* as referents in the zone by delivering information acquired through life experience on the effects of floods and “*sudestadas*” (heavy storms from the South), with fine knowledge of the families, issues and evolution of the

settlements. This source of information is of great value at the time of defining local emergency plans and in order to count on implicated actors.

- During the mapping exercise with the local actors, the need to regard the Western coast of Montevideo as a critical zone for climate threats was proposed. This was taken into consideration due to the loss of beaches and its impact on the tourism of about 200,000 people that belong to this zone and use them. Hence, the seashore was added to the analysis.

From the analysis of threats, commitments and needs required to achieve a local agenda in disaster risk management, the following aspects raised:

- Two additional problems were identified at the focus area that aggravate the floods issues and that are not of climatic nature. The problem of solid wastes dumped into the creeks and the remains of stolen cars that function as a dam, overflowing the creeks.
- It is necessary to produce local information and collect data from the flood-prone areas. The information is partial and limited to deal properly with the problems to solve.
- More complete population data of the risk areas is needed (number of children, disabled, women, etc.)
- Identifying refuges with adequate conditions.
- Identifying the causes of the floods and actions to be taken (relocation, municipal regulations)
- Regularly updating the mapping of settlements in the watershed.
- Generating coordinated mechanisms of communication among neighbours and emergency authorities. Both parties claim that they are not informed in due time, and many times the information they receive is through the press or the area of information dissemination of the Municipal Government.
- Generating forms of diffusion and education of the population.
- Activate the participation in the Municipal Emergency Coordination Committee: It was put forward that this committee must be activated with all its functions and proposals. Lack of organization and coordination among the different actors involved has been pointed out.

From this very preliminary analysis of the Pantanos watershed and the west zone, several opportunities arise:

- The *decentralization process of the departmental governments*, especially since the assumption of the new zonal councillors in 2011. These representatives do not have training or awareness background regarding environmental issues or on disaster risk management for which it is necessary to continue this formative process.
- The existence of the *Municipal Plans for Development* for the period 2010-2015 that each municipality has devised, and within which are defined the elements to “orchestrate a system of immediate response to emergencies”, among the strategic lines of action.
- To activate the current spaces of communal participation as in the Municipal Emergency Committee, as well as the opportunity to count on the Environmental Commissions as places for replicating information and raising awareness in the population in order to reduce risk conditions; they also have convening power for neighbours and COMMAC can provide articulation.
- More so, it becomes known that as a consequence of the interviews with local referents the Unit and coordinating Technical Team for departmental emergencies is created by municipal government resolution, operating within the framework of Municipality A.

The participation of the Municipal Government of Montevideo, the constant support of the Environmental Education Technical Team (E TEA) and its disposition to facilitate the current networks in the social area at the outstanding territorial level should be considered. Likewise, very positively appraised is the support provided by the Technical Coordinating Team of departmental emergencies, that conduct functions for



the entire department and that operate from Municipality A, as well as the technicians of the Community Centres zone.



## **Climate Change and Local Disaster Risk Management Workshop - March 2012**

### **4. Lessons Learned and replicability**

#### **4.1. Lessons Learned**

- *State-Civil Society-Community:* In addressing the difficulties that come into question from different sectors of the State while implementing certain requirements in the water resources management, the civil society occupies a pivotal place as a link to the community, a generator of local knowledge and support to the development of management instruments.
- *Community participation:* It is fundamental to identify current spaces for communal participation and to promote its action as well as encouraging a link to social organizations and authorities.
- *Access to information:* In order to achieve success in the applied policies, it is necessary to facilitate information about the population in real time.
- *Decentralization:* The municipal Governments require capacitation to be able to spawn local information and organize the plans with a prevention approach and supply local responses upon emergencies as well as minimizing the impacts.
- *The disaster risk management based in processes.* The project time frames do not provide sufficient time to construct links and visible improvements for a prospective Disaster Risk management. The disaster risk management is based on processes. Therefore, it needs different time window to achieve commitments in the community and the authorities to incorporate the concepts in the cultural patterns.

#### **4.2. Replicability**

The local disaster risk management is aimed to generate a prevention culture within the community, to make it ready upon an event, to improve its organizational capacity and to make more efficient implementation of the early warning systems that the State would want to integrate. Empowering of neighbours organizations and educational institutions significantly to reduce vulnerabilities and therefore, is an instrument replicable in other countries with different natural or socio-natural events, allowing to



incorporate the local expertise and the different realities of the community in its link with water and the territory.

#### **4.3. Importance of case for IWRM**

Strengthening the vulnerable communities upon climate risks represents a key tool for the integrated water resources management, since it contributes to empower the population, engaging it in the different spaces of water management and in jointly defining the best strategies of organizing the territory in order to contribute to trim the vulnerabilities.

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