



**CASE STUDY**

# El Salvador: Early Warning System in San Pedro Masahuat Community



## Summary

El Salvador has experienced an increased vulnerability due to Climate Change. To tackle the challenges, an Early Warning System has been installed. This is part of the strategy of the local government to reduce the vulnerability and develop the capacity of the area to deal with floods and landslides. One lesson learnt is that political stability in an area is a great asset when carrying out any political reform.

## Background

The San Pedro Masahuat municipality is located in the La Paz department, in El Salvador's central region. Due to its geographic location, the San Pedro Masahuat municipality faces vulnerability conditions that are worsened by the rise of the Jiboa and Sepaquiapa rivers during the winter season, generating great floods; as well as by other natural phenomena that have affected the territory over time.

The intensity and increased number of natural disasters in El Salvador have resulted in increased needs to invest into emergency care and rehabilitation. The country is also facing the challenge of overcoming inadequate management of natural resources, including water. Coupled with the impacts of climate change, this is contributing to increased levels of vulnerability of the people.

Deforestation as well as the expansion of the agriculture frontier through land use conversion from forests to subsistence crops, extensive cattle-ranching and sugarcane crops, and the persistence of cultural practices such as burning and intensive use of agrochemicals; are some of the factors that are increasing the levels of vulnerability for the territory. The geo-environmental characteristics

of the region increase the risks of flooding and landslides due to strong rains that impact the territory during winter. This makes the territory population's living conditions even more vulnerable.

To tackle these challenges, the Municipality of San Pedro Masahuat has installed an Early Warning System which has a significant impact in improving the lives of the inhabitants. This has been possible through awareness raising, education and the commitment from organizations to address issues of climate change related vulnerability challenges.

## **Actions taken**

The municipality of San Pedro Masahuat, in central El Salvador, has a successful experience in the implementation of Early Warning System (EWS). The municipality's Early Warning System has four components:

1. Monitoring, which consists of the collection of information about rain volumes falling on the

Jiboa River high basin through the use of hydrometeorological stations and the use of pluviometers;

2. Communications, which consists of the storage and transmission of the data collected to the Monitoring Center of the Ministry of Environment and the National System for Civil Protection as well as the San Pedro Masahuat municipality's Risk Management Unit;
3. Analysis and Forecasting, which is achieved through the comparison of information from different years in order to determine trends regarding the possibility of floods in the territory;
4. Response from the Vulnerable Population, which occurs through the sounding of alarms when there is flood danger in the territory, in order to activate the Emergency Plan.

One of the key stakeholders for the functioning of the communications protocol established in the municipality's EWS is the Network of Local Observers which is made up of volunteers that live in the upper and middle areas of the Jiboa River basin. The Network of Local Observers have been trained and equipped to measure the quantity of rain that falls in these areas.

The information generated through these measurements allows decision making in the case of possible floods in the territory. The system is a part of the strategy of the local government to reduce the vulnerability and develop the capacity of the area to deal with floods and landslides as these disasters bring social, economic and environmental impacts on the municipality and the surrounding territories.

The implementation of the EWS includes the construction of a network of hydro-meteorological stations that provide real-time data, the use of software and hydrological models, scientific and hydrological analyses and information sharing.

The most important part of the EWS is the capacity building at the local level and the communication between community leaders and the population living in high risk areas. In other words, local monitoring is important, as well as the feedback and coverage from the network of local observers. This has helped reduce the impacts of the disasters of the communities to climate change related vulnerabilities.

## **Outcomes**

National institutions such as the Governance Ministry, the Civil Protection System, the National Service for Territory Studies and others, including international entities, have recognized the success the San Pedro Masahuat municipality's Early Warning System (EWS) has had. Among the success factors that have supported the good performance of this initiative are:

- The political commitment of the municipal government to use part of its resources available to work on the topic of risk management for the benefit of the territory's population.
- The development and strengthening of local risk management capacity through community organization, disaster preparedness, the preparation of community committees to address emergencies, and the improvement of the population's response capacity in the face of adverse events.
- The capacity to mobilize resources among national support agencies and the international cooperation has allowed the financing of some projects focused on the topic of vulnerability in the municipality.
- The development of alternative projects, in the productive area, for the territory's economic

recovery through the exchange of local seeds, the creation of home gardens with the families affected by adverse events, the protection of agriculture parcels with live fences, productive diversification and the training of farmers in the production of organic fertilizers.

- The protection of priority micro basins in the Jiboa River through the construction of mitigation works such as drainage canals, rainwater and wastewater control in the communities, the construction of small projects for gabion retaining walls, the construction of an Emergency Operations Center (COE) and the equipping and improvement of shelters to help affected people.
- The communications protocol implemented by the municipality's Risk Management Unit has allowed for the generation of effective information channels at a local and municipal level, It has also allowed establishing linkages with the National Civil Protection System and the General Office for the National System for Territory Studies (DGSNET) of the Ministry of Environment and Natural Resources, now the General Bureau of the Environmental Observatory.

## **Lessons Learned**

The response from the organized communities was exceptional and the communications protocol was implemented. The EWS worked perfectly - the result was zero victims in the municipality because of floods and landslides, despite the enormity of the phenomenon.

The political stability in the municipality , has been an asset to the risk management approach in the area because it has allowed a continued planning and training in communities, as well as acquisition of right equipment for disaster response.

Having networks of organizations and leaders who are well trained, motivated and equipped to deal with the vulnerability of the territory - facilitates the operation of the established EWS has been crucial for the success of the system.

The administration in the municipality showed interest and political will to push the issue of

vulnerability reduction and this ensured that the actions taken are sustainable over time.

Local people who are involved in the establishment of EWS must have time and interest to work on the system.

This approach has resulted in active citizen involvement in risk management of extreme events - before, during and after the event

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**Related IWRM Tools**

Integrated Flood Management Plans, Local Authorities, Communities of Practice

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