Global Water Partnership Central America

GWP El Salvador

CASE STUDIES FOR THE TOOLBOX: CLIMATE CHANGE ADAPTATION AND VULNERABILITY REDUCTION

"EL SALVADOR, CENTRAL AMERICA"

THE EARLY WARNING SYSTEM (EWS) FOR THE SAN PEDRO MASAHUAT, LA PAZ DEPARTMENT, EL SALVADOR

- APRIL 2011 -

SUMMARY

Floodingofurban and rural areas of El Salvador has always been a recurrent problem. Historically, there are registers of a hurricane that in 1934resulted in 500 millimeters of precipitation in just3 days; causingfloodings and losses throughout the entire country. Similarly, in 1974, HurricaneFifíproduced great floods in the country as Hurricane Mitch did in 1998. In 2005, it was Hurricane Stan which brought attention to the country's vulnerability to these types of phenomena[1].

However, it has been confirmed that the strengthening of coordination between the municipalities, communities, non-governmental organizations, and civil society institutions;and a broad support fromscientific institutions formonitoring and research;as well asthe financial support from the international community and on behalf of the central government; can create greater opportunities for success in the implementation of early warning systems-EWS. All of these, can support EWS reduce the negative impacts that hydrometeorological events have on human lives in the short, medium and long term.

The implementation of anEarly Warning System includes the development of a network of real-time hydrometeorological stations, the use of software and hydrological models, hydrological and scientific analysis, and being able to rely on a good flow of information. The most important thing, however, is the development of local capacity as well as an ample communication among community leaders and the population that inhabits the high-risk zones that can be affected by hydrometeorological phenomena. In other words, it is important to be able to rely on local monitoring, feedback, and very goodcommunications coverage with the Local Observers Network.

Currently in El Salvador with regards to climate change, the number and severity of hydrometeorological events is on the rise. The more frequent and extreme events produce even more serious catastrophes; requiring the investment of a great amount of resources for emergency response and recovery.

The torrential rains thatoccurred in the country in the first week of November 2009, due to tropical storm Ida, provided evidence of the vulnerability to which a significant part of the Salvadorean community is exposed.

Floods, landslides, collapses and other calamities occur as a consequence of the effects of climatic events. Nevertheless, while it is predictable that these events will be frequent and recurring in these times of worldwide atmospheric inestability; we still are exposed without effective responses in the face of these phenomena. Protection efforts during and after emergencies are vital to, at least, alleviate the suffering of victims in the moment of major crisis; but, a preventative policy is required as well as a culture of adequate risk management.

The vulnerability of some regions has somewhat halted the processes for territorial development. The level of vulnerability becomes evidentwhen the damages are accounted for after successive disasters and the number of human lives affected– not just those that are lost, but those that are left more vulnerable than before– is revealed; as a result of the losses in crops, basic services and communication infrastructure, among others, that represent a setback in the development of the populations affected.

The *Global Assessment Report onDisasters Risk Reduction 2009*, published by UN prior to the summit on climate change, classifies countries in 5 categories ranging from "very low" (category 1) to "very high" (category 5) in regards to economic vulnerability due to the risks of natural threats.

[1]Data fromthe General Directorshipof theNationalService for TerritorialStudies(Dirección General del Servicio Nacional de Estudios Territoriales -SDGNET)

El Salvador, which is in the fifth category, is among the countries that aside from suffering great economic losses with respect to its Gross Domestic Product (GDP)have a low capacity level for recovering from losses; and,therefore can experience "significant reversals in its economic development."

The reportrelates disaster vulnerability with poverty and signals that the poor households "tend to have a very limited capacity to obtain and use assetsthat otherwise will allow them to alleviate the losses suffered by disasters."

Besides, it provides evidence that climate change strengthens the relationship between disaster risk and poverty. This phenomenon, which is already acknowledged, increases the hydrometeorological threats and diminishes the capacity of poor households to recover from the losses suffered due to lost harvests, to the increase in mosquitos' populations, and water and electricity scarcity in disaster-prone areas.

However, besides climate change, other factors that increase the interrelationships between natural disasters and povertyhave been identified: the deterioration of ecosystems, deficienturban and local governance, and the vulnerable nature of rural livelihoods.

In its seventh chapter, the report analyzes the work that is carried out by the countries studied on the topic of risk management and suggests: "*It is precise to enhance thelinkages between the systems providing early warnings of impending hazards and the organizations responsible for disaster preparedness and response; local and community capacities for preparedness and response also need to be strengthened*."

As a result of El Salvador's vulnerability scenario, the implementation of early warning systems is vitally important in order to safeguard the lives of people who live in high risk areas and who, in the face of adverse events, become those who are first affected.

An advanced experience exists in the San Pedro Masahuat municipality, in the La Paz department of El Salvador's central region, with regards to the implementation of early warning systems. It was started by the local government as part of the efforts to reduce the area's vulnerability and to address flooding and landslides, especially in the winter, where these generate social, economic and environmental impacts in the municipality.

This case studycontains the systematization process for GWP Central America's TOOLBOX for the Early Warning System (EWS) experience implemented at a local level by the San Pedro Masahuat municipality.Through the passing of time, the experience of the San Pedro Masahuat municipality has become an example of speed and efficiency in the collection and dissemination of information that has allowed for a local reduction in the impacts of adverse phenomena, and especially of those related to hydrometeorological events.

Tools Used:

B1.9 Civil society institutions and community organizations, B1.10 Local authorities,C2.5 Risk Assessmentand Management, C4.2 Communications with stakeholders

Key words:

Risk management, climate change, vulnerability reduction, early warning systems, community organization.

Written by:

Enrique Merlos as per request of GWP Central America.
enriquemerlos@gmail.com

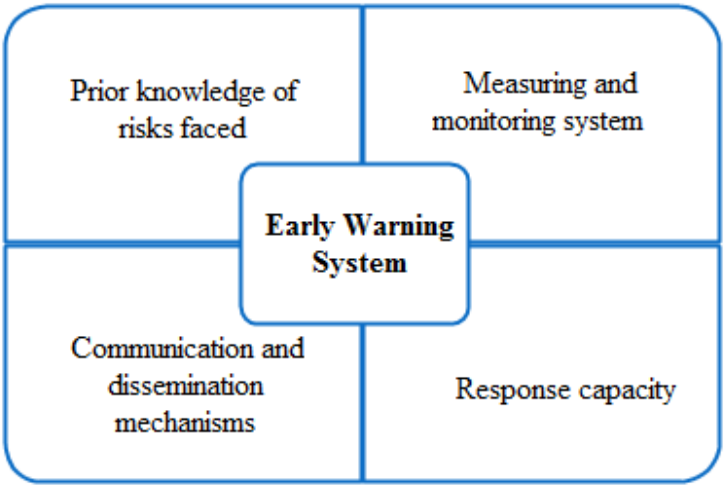
THE EARLY WARNING SYSTEM(EWS)

It is known and accepted that the Early Warning System(EWS) is an important element for risk reduction since it contributes to preventing loss of livesand reduces the impacts of phenomena that could become disasters.

The objective of early warning systems focused on people is to provide information to individuals and communities threatened by hazardsso that they may act appropriately and with enough time in order to reduce the possibility of personal losses, loss of lives, and damage to properties and the environment.

A complete and effective Early Warning System is made up of four interrelated elements, starting with the identification of faced risks, to preparation and response capacity, reinforced by effective communication mechanisms. The failure of one of these elements can lead to the failure of the entire system. The following diagram shows the EWS components.

Figure No.1
Early Warning System (EWS) Components



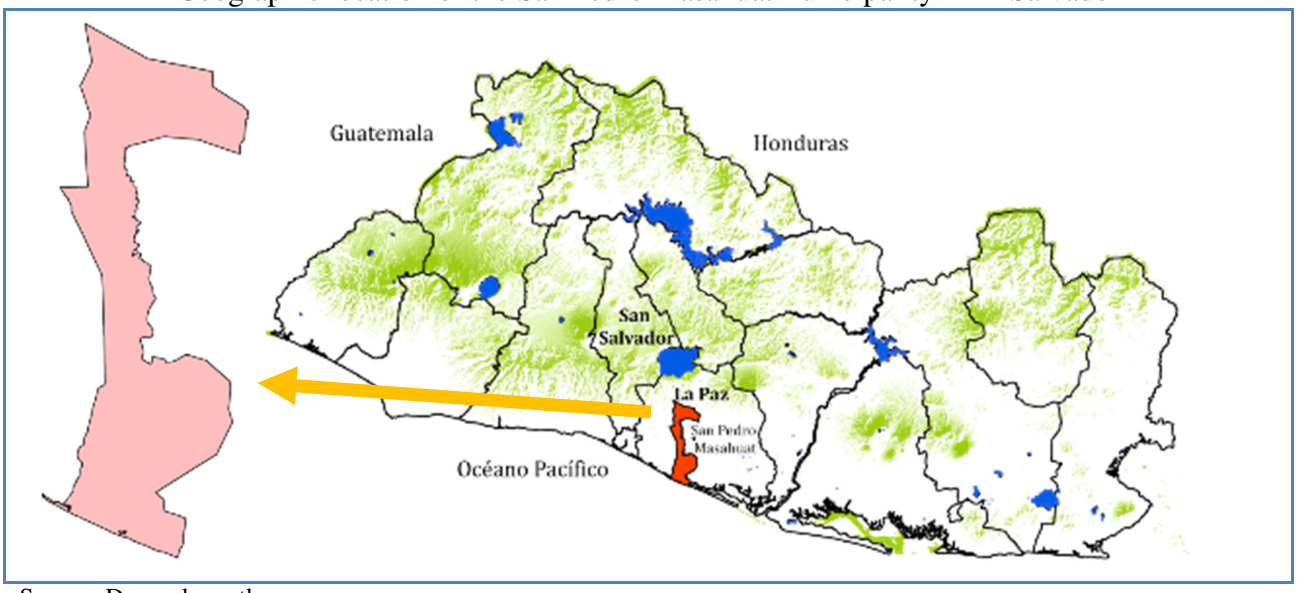
Source: National Center for DisasterPrevention (Centro Nacional de Prevención de Desastres -CEPRANED), México

The objective of all early warning systems (EWS) is to provide the inhabitants of high vulnerability levelcommunities , with a tool that will allow them to react in due time when facing an imminent flood or other risk situation in order to safeguard their lives and property. In this sense, there are 5 concrete goals in the implementation of EWS: a) To establish institutional mechanisms and procedures directed at detecting, within an opportune timeframe, the imminent occurrence of dangerous phenomena that could cause damages to vulnerable populations b) To monitor indicators that allow for the identification of the event's imminent occurrence; c) To communicate alerts to populations at risk d) To activate the community alarm mechanisms to guide the evacuation of the exposed population to secure places or areas; and e) To collectand process information for reflection and analysis that will allow for better orientation in decision-making around vulnerability mitigation.

THE SAN PEDRO MASAHUAT MUNICIPALITY

The San Pedro Masahuatmunicipality is located in the La Paz department, in El Salvador's central region.It is one of the sixteen municipalities that make up the Los Nonualcos Municipal Association (Asociación de Municipios Los Nonualcos -ALN). It has a size of 96.38 km^{2}and is made up of 16 cantons and 27 small villages. Its municipal center is located at an altitude of 203 meters above sea level, although the territory reaches sea level at its southern border.

Map No.1
Geographic location of the San Pedro MasahuatMunicipality in El Salvador



Source: Drawn by author

San Pedro MasahuatwasfoundedonFebruary 21, 1852, and itsautochthonousname comes fromthenáhuatdialect and means: "abundance of water and deers." Itsinhabitantswereknown as"los masahuas", a Pipilcommunitywhichlived in theterritorybetweenthe XI and XII centuries (years 1,000 to 1,200 of our era), andfromwhichvariousvestiges exist.

The municipality possessesa number of water resources such as the rivers Jiboa, Tilapa andSepaquiapa. It also has coastal planes, swampland beaches, and mountains where various ecosystems can be found. Its primary economic activity is concentrated on the production of basic grains, artisanal fishing, and small-scale commercial activity. It also has great tourism potential asit is located near the Comalapa International Airport and the city of San Salvador.

According to poverty maps from the United Nations Development Program (UNDP) and the Social Investment Fund for Local Development (Fondo de Inversión Social para el Desarrollo Local - FISDL), San Pedro Masahuatis classified under extreme low poverty level Municipalities; despite the fact that tropical storms in recent years have provoked a deterioration in the living conditions for its inhabitants, especially those of the coastal area.

THE TERRITORY'S VULNERABILITY

Due to its geographic location, the San Pedro Masahuat municipality faces vulnerability conditions thatare worsened by the rise of the Jiboa andSepaquiaparivers during the winter season, generating great floods; as well as by other natural phenomena that have affected the territory over time.

During the months of October and November 1998,the HurricaneMitchaffected the Central American region. It generated very high rainfall registers in the upper region of theLa Paz department along the entire Jiboariver basin. The highrain intensity causedstrong water discharge in the coastal areas. This provoked the overflowing of the Jiboa andSepaquiapa rivers,and wastranslated into harvest and domestic animals losses that greatly affected the economy of the San Pedro Masahuat municipality.

On January 13 and February 13, 2001, a good part of the Salvadorean territory was shaken by two strong earthquakes that strongly affected the population, the infrastructure, and the national economy. The San Pedro Masahuatmunicipality lived through this tragedy which caused considerable damage in local infrastructure. Damages include the loss of more than 2,700 homes,and damages to buildings such as the Catholic church in the urban center, hermitages of the different small villages and cantons,and schools in the Las Hojas and SanMarcelino cantons. In total, more than 10,000 people were affected and 4 people died in the municipality. There were also various landslides in its high areas.

In 2005, Tropical Storm Stan generated intense rains that led to the overflowing of the Sepaquiapa andJiboa rivers, causing floods in the entire southern area of the municipality. Houses were also lost in the El Achiotal, Santa María, and Las Moras communities. Many harvest areas were also totally flooded, and, as a result, the basic grains and vegetable harvests were lost.

On October 21, 2007 rains generated by a low pressure system in Guatemala's Pacific coast and a tropical wave in the pacific region generated damages in the municipality where 9 homes were lost in the community of Los Achiotales. Additionally,harvests were lost in the communities of Santa María, El Coyol, Las Hojas andLas Moras.

Due to its geographic location in the coastal zone, and since various rivers cross its territory, the vulnerability of the San Pedro Masahuatmunicipality is greater and represents a problem that limits its sustainable development. Deforestation as well as the expansion of the agriculture frontier through land use conversion from forests to subsistence crops, extensive cattle-ranchingand 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 oftheregion 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.

LOCAL RISK MANAGEMENT STRATEGY

The initiative to begin working on risk management was born in 2003 with the arrival of a new mayor's administration linked to the leftist party, FarabundoMartí Party for National Liberation (FMLN). Despite thevulnerability of the territory, previous local governments had not made progress in generating the political commitment to work on this topic. In 2003 the process of community organizationand education of the population began, with the aim ofhighlighting the importance of preparedness in facing adverse effects like floods or landslides.

As a result of the efforts started, aCooperation Agreement was achieved between the Municipal Communities, American Red Cross, USAID, Red Cross of El Salvador, International Resources Group (IRG), the National Emergency Committee (COEN) and the San Pedro Masahuat municipality. This agreementled to the development of a Municipal Emergency Plan and a Risk Management Plan. These are technical documents that include risk maps and land use zoning maps, among others.

From 2003 to 2009, the work process developed in the territory became a permanent effort and was focused on community organizing, on following the Municipal Emergency Plan, and on the execution of diverse training processes in order to build capacities among the population.

Due to the adverse phenomena that year after year hit the territory with greater intensity and growing negative impacts, the local government decided to create a risk management unit on May 2009.

From its start, the unit has only relied on one staffperson who has been in charge of operatingthe risk management tasks. The creation of this unit led to the mobilization of some cooperation support thatallowed for the strengthening of the actions. Some of these support entities were the Japanese International Cooperation Agency (JICA) through the BASAI project; and the German Technical Cooperation Agency (GIZ) through the RyGRAC project. The support of GIZ provided the equipment for the Risk Management Unit as well as advice and training for the person in charge of the unit.

The San Pedro Masahuat Risk Management Unit staff has always been limited.However, thanks to the community coordination with national and international support agencies, significant impacts have been achieved as well as the sustainability of the work done forrisk management. By mid-2010, the unit had a support technician linked to the National Civil Protection Network of the Governance Ministry as well as an expert volunteer in risk management linked to the Japanese International Cooperation Agency (JICA).

The technical support that the unit has counted on has allowed for the coordination and planning of various work efforts at the national level. Likewise, it has also maintained management processes to mobilize resources to provide equipment to the community councils organized to work on the topic of risk management. Besides contributing with equipment, JICA has also collaborated in capacity building through the transfer of knowledge, methodologies and experiences on how Japan addresses adverse events that impact its territory.

In 2010, the Risk Management Unit proposed the involvement of youth in the work processes in order to address the territory's vulnerability. Therefore, lectures and trainings were developed in the municipality's learning centers, prioritizing those located in high-risk areas. This training and learning process was carried out with school children using Japanese methodologies such as the "frog caravan" in which school children learn, through a game, how to rescue people affected by flooding and landslides, how to provide first aid, and how to use the resources available during disasters, etc. This has been done with students and has involved the directors and teachers of the learning centers so that they also become acquainted.

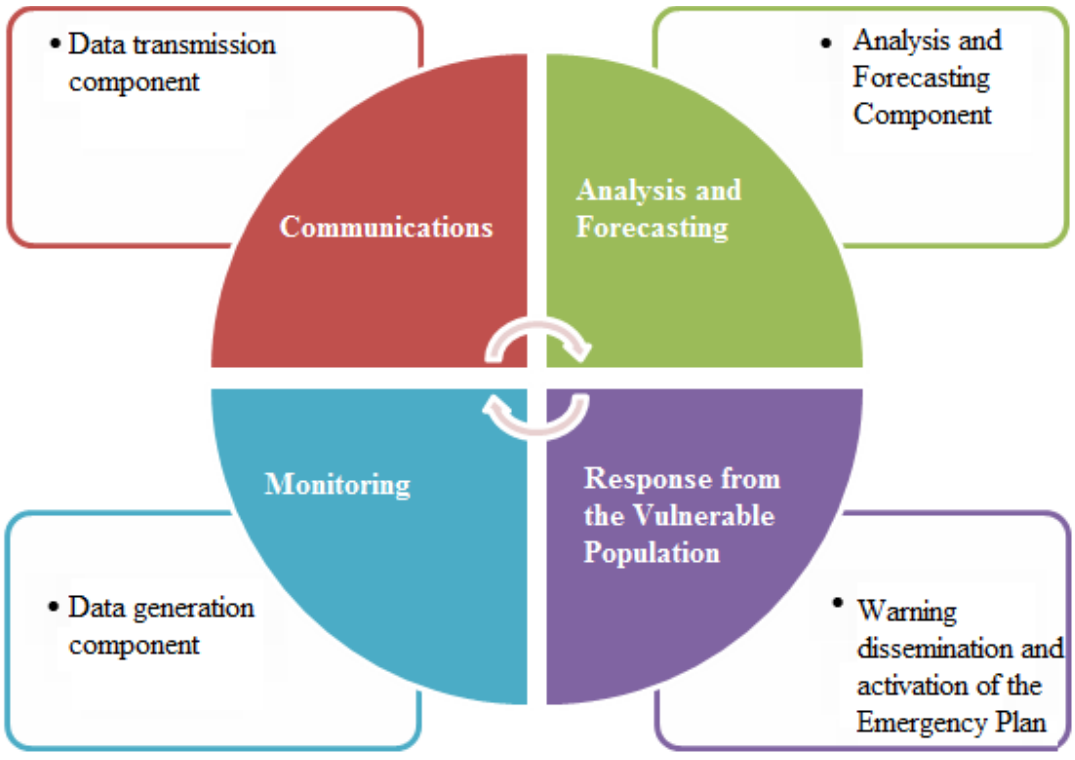
This work has been complemented by strengthening the organization of the local population and through the creation of municipal and communal commissions forcivil protection. Through these commissions, different operation brigades werecreated to be in charge of first aid responses, rescue and evacuation, shelter administration, damage evaluation, etc.Now, as a result of the capacity building in the territory, two people can be in charge of the monitoring and management of the Early Warning System in each community.

The San Pedro Masahuat´sEWS is a package of processes designed and structured to warn the municipality's southern area (lower basin) with due anticipation of a possible flood. It is made up of

a network of local observers, technical staff from the mayor's office and specialized staff from the National Service for Territorial Studies (SNET) and the National Civil Protection System.The development of this system has allowed for: a) the expansion of the Communication Network through the installation of communication radios with the goal of covering the greatest quantity of communities located atthe municipality's high risk areas; b) the hydrometeorological monitoring of a good portion of the Jiboa river basin; c) strengthening the organizational structures for attention to risk at the community level; and d) improving the distribution mechanisms for alerts at the community level in the municipality.

The objective of the System is to allow communities located in the lower basin of theJiboa riverwatershedto count on opportune information and with enough time to respond to an emergency situation and/or disaster that can be generated by flooding due to the overflowing of the Río Jiboa. In order for this to function, the EWS relies on a communications protocol which is activated especially in the winter season. In the next graphic, the communications protocol components for the Early Warning System of San Pedro Masahuat are shown.

Figure No.2
EWSCommunications Protocol for San Pedro Masahuat



Source: Developed based on the information from the San Pedro Masahuat Municipality

The municipality's Early Warning System has four components:**a) 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; **b) 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; **c) 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; **d) 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 IMPACT OF TROPICAL STORM IDA

The rains caused by Tropical Storm Ida during the night of November 7, 2009 made evident the high level of vulnerability that El Salvador faces. In four hours, 355 mm of rain were registered in the entire country; a significant figure especially considering that during Hurricane Mitch (1998) 400 mm were registered over 5 days.

The high and coastal areas of the departments of San Salvador, San Vicente, La Paz, La Libertad and Cuscatlán were the most affected. At a national level, 198 people died, 17 disappeared and more than 14,000 people relied on shelters.

In addition tothe unfortunate human losses and the thousands of people affected, at a national level landslides and floods led to the collapse of bridges and street closures. Communities and municipalities were left without access and many losses were registered in agricultural harvests such as beans, corn, sugarcane and coffee. Similarly affected were other activities like artisanal fishing and small and medium local enterprises.

According to a study by CEPAL[2], the losses and damages for El Salvador as a result of Ida totaled 239million 190 thousand dollars, of which 43.4% corresponded to direct losses of micro, small and medium enterprises as well as agricultural and livestock activities. The rest corresponded to damages in public infrastructure (road networks, electricity network, schoolsand health centers), housing and machinery. In the La Paz department, the total losses from Ida totaled 56 million 600 thousand dollars.

On November 7, 2009, 355 mm of rain were registered in the Jiboa River high basin area and the rain from November 8 led to the overflowing of the JiboaRiver and its main tributaries --the Sepaquiapa andTilapa rivers.

This situation tested the San Pedro Masahuat municipality's Early Warning System (EWS) which entered into emergency mode as of November 6th, by activating the Civil Protection Municipal Commission and making permanent use of the EWS in order to inform communities in the territory about threats. On November 7, the threat remained, as well as constant monitoring with local commissions which resulted in an evacuation order to threatened communities. On November 8th, when the floods occurred, rescue brigades were established in order to support the affected population. 12 shelters for 2,394people affected were established throughout the municipality.

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[2]*Socioeconomicand environmentalimpact and theriskduetothelowpressureassociatedwith Tropical Storm Ida in November 2009*, publishedby CEPAL in February 2010.

The impact of Ida was a significant event for the municipality since it directly affected 673 families and completely destroyed 79 homes and damaged 715. Additionally, 1,620 acres of crops were lost. The estimated cost for the rehabilitation and reconstruction of the impacts suffered is 19 million 417 thousand dollars.

At a national level, San Pedro Masahuatwas one of the municipalities most affected by Ida, where, despite its impact, did not register any loss of life. This was due to the efficiency of the Early Warning System (EWS) in place in the territory.

RESULTS OBTAINED

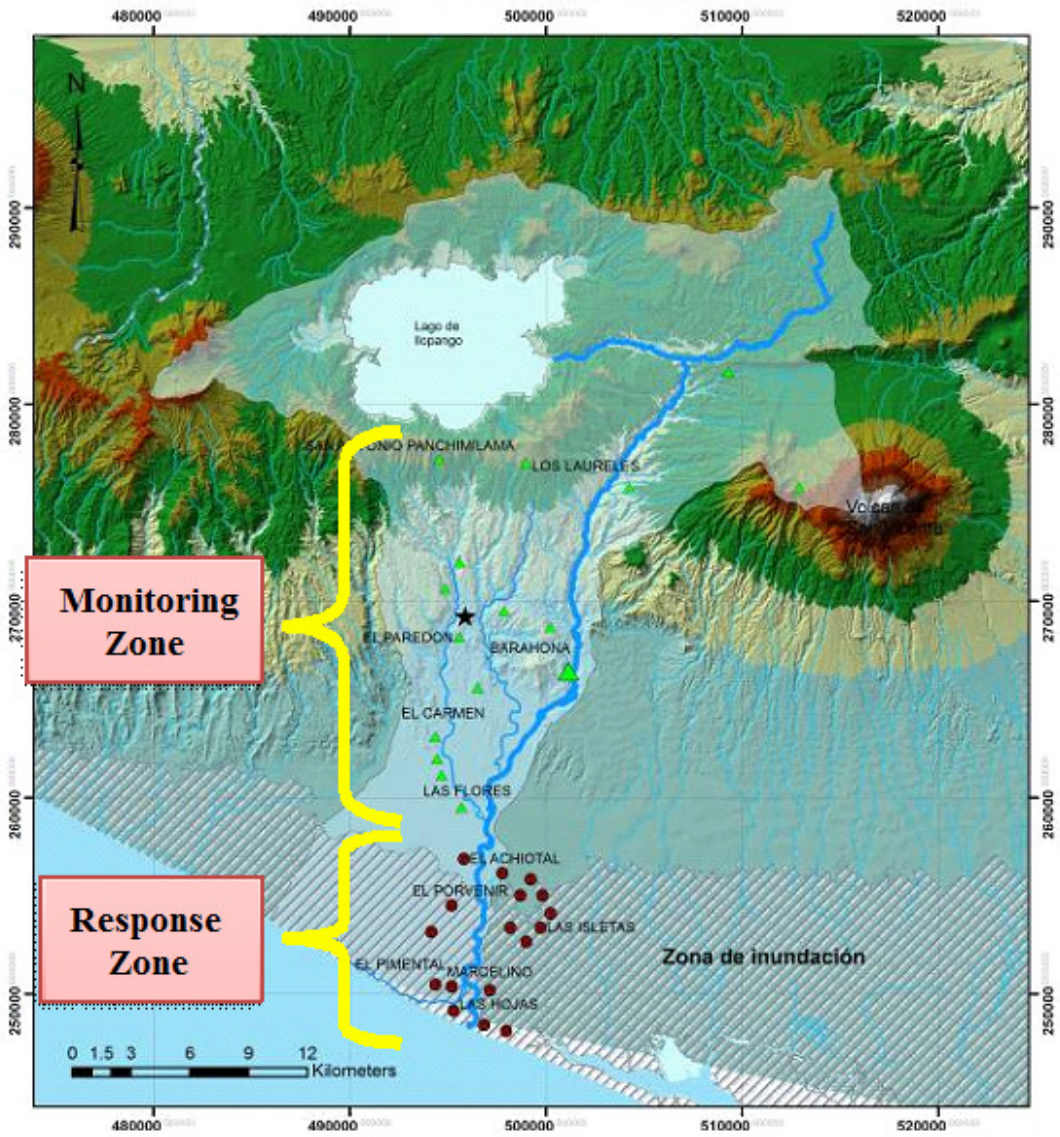
The San Pedro Masahuatmunicipality has 52 communities, and, as of February 2011, 30 have been organized and have established civil protection commissions while also counting on the equipment necessary for the development of their work. These communities are those with the greatest vulnerability conditions and are concentrated in the municipality's southern region, which is also the coastal area. The communities in the southern areahave made efforts to coordinate among themselves in order to support one another in difficult times of adverse event impacts. This has helped to better address emergencies.

As of 2011, there is a proposal to work on community organizing and preparation for risk management in the territory's northern area as part of the strategic planning process for the San Pedro Masahuat municipality's Risk Management Unit. This will take advantage of the potential that exists at an organizational level in the southern area.Additionally, it can serve as an example and motivating element for the communities that arenotyetorganized.

As part of the San Pedro Masahuat Risk Management Unit and the Emergency Operations Center's innovation and development, a series of responsibilities have been defined in order to work on vulnerability issues in the territory. Some ofthese responsabilities include: **a)**To establish and maintain coordination, execution and communication links with public and private, and local and international bodies responsible for responding to emergency situations and/or implementing mitigation projects; **b)**To implement preventative measures to mitigate natural risk factors that threaten the security of the municipality's inhabitants; **c)**To maintain periodic monitoring through the Municipality's Early Warning Systemas well as through the coordination with national organisms such as the National Service for Territorial Studies (SNET), the National Civil Protection System and others; **d)**To coordinate the development and implementation of emergency and/or evacuation plans, as well as to organize the Communal Civil Protection Commission; and,**e)**To incorporate risk analysis in municipal public investment projects so that the projects to be executed can rely on mechanisms to reduce the impact of threats and the territory's vulnerability level.

As a complement to this and as an alternative to the contribution to improving the territory's conditions in addressing events such as floods and climate change impacts, reforestation campaigns were launched in theSan Pedro Masahuat municipality.These campaigns were launched together with the schools and community groups, in the high areas of the municipality and especially in the banks of the rivers that traverse the territory. At the same time, awareness-raising and training processes for producers have been established.The idea is that producers may adopt soil conservation practices, over time, and establish productive land parcels using organic materials and substituting the use of agrochemicals which, aside from being hazardous for health, impoverish the quality of soils and contribute to reducing the vegetation coverage in the rivers' basin.

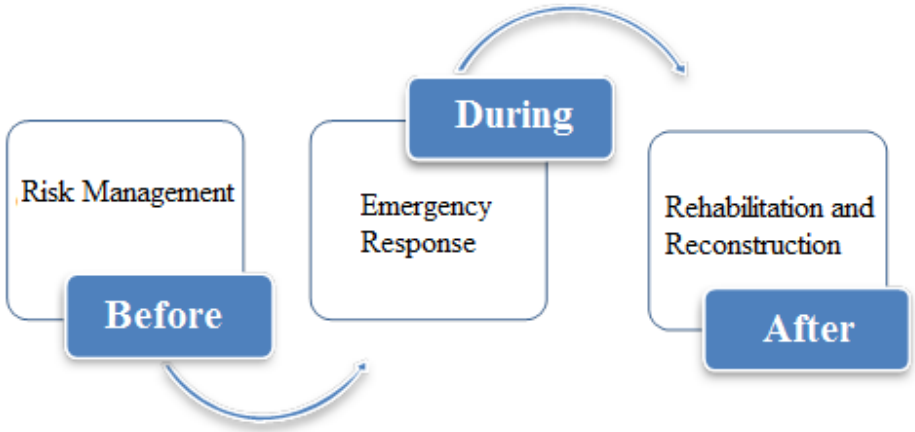
Map No.2
Presence of the Early Warning System in the Jiboa River basin linked to the San Pedro MasahuatEWS.



Source: RyGRAC Project of the GIZ 2010

Institutionality has been created in the municipality with the abilityto address the topic of riskmanagement in phases before, during and after emergencies. This institutionality is built into the Early Warning System (EWS) in the upperarea (for monitoring) and in the lower area (for response) of the Jiboa River basin. This supports a sustainable development focus with the incorporation of risk management at the basin level and the municipalities.

Figure3
Preparing the Municipality for Risk and Disaster Management



Source: Elaborated based on information provided by the Municipality of San Pedro Masahuat

SUCCESS FACTORS FOR THE SAN PEDRO MASAHUATEWS

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'sEarly 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 cooperationhas 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 thefamilies affected by adverse events, the protection of agriculture parcels with live fences, productive diversification and the training of farmersin 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.

CHALLENGES FACING THE EWS IN SAN PEDRO MASAHUAT

Despite the progress the San Pedro Masahuat municipality'sEarly Warning System has had, there are still some local challenges and others related to the national environment.These challenges limit the effective procedures for risk management in the territory. Some of these challenges are:

- ☑ The municipality and stakeholders involved in the functioning of the municipality's Early Warning System are worried that year after year adverse events would become stronger and would increase the level of vulnerability in the municipality.

- ☑ Usually, during the rainy season, the Jiboa River overflows; however, with the pass of time this effect is becoming stronger due to improper environmental management in the middle and upper areas of the Jiboa River basin. Putting a stop to this situation requires the construction of retaining walls at the edges of the Jiboa River,and thatrequires a great investment that the municipal funds cannot cover.

- ☑ As a result of the floods,some producers in the municipality are not motivateddue to recurring losses in their harvests and cattle-raising activities. This threatens the territory's productive capacity.

- ☑ The lack of organization in community networks and among local observers at a national level affects the progress of the basin's risk management.This is the result of the limited scope of the municipality's EWSwhich does not cover the middle and upper areas of the Jiboa River basin where the majority of the problems causingfloodings in the lower area originate.

LESSONSLEARNEDFROMTHEEXPERIENCE

The occurrence of Tropical Storm Ida was a tough test for the San Pedro MasahuatEWS in which a good response on the part of organized communities was achieved, as well as the implementation of the communications protocol. The EWS functioned perfectly and was translated into an impact of zero victims due tofloodings and landslides; despite the breadth of the event.

The continuity of the same political party in the municipality since 2003 has been a strong point for the risk management focus in the territory.This has allowed for permanent work on the organization and development of communities, as well as for adequate disaster response preparation.

Being able to count on an organizingnetworkand a network of male and female leaders who are well-trained, motivated and prepared to face the territory's vulnerability facilitates the work of the Early Warning Systemthat was established.

The administration of any municipality should demonstrate interest and political will in order to further address the issue of vulnerability reduction,and thus ensuring that the actions implemented are sustainable over time.

All of the different stakeholders of the municipality should be taken into account. Likewise, communities and leaders should be given the opportunity to participate in decision making, as they are the ones who know about the concrete vulnerabilities affecting their territory.

However, while the mobilization of economic resources is necessary, it is even more important that everyadministration looks at risk management not as an assistance function, but as a part of public investment projects.

The people at the community and municipal level that are involved in the creation of an Early Warning Systemshould have the availability and interest to work on the issue.

El Salvador is a country facing the challenge of overcoming inadequate management of natural resources. Because of this inadequate management, the population's vulnerabilities levels to the impacts of climate change have increased, thus,making the need to work on vulnerability reduction even more urgent.

In this framework, the San Pedro Masahuat municipality's early warning system has become an example to follow.It has generated significant impacts through its activities in the territory and has slowly become an opportunity for the improvement of the living conditions of its inhabitants through awareness-raising, education and organization related to vulnerability response.

This has translated into the formation of citizens who are active in risk response, before, during and after the occurrence of adverse phenomena.This has led to fewer impacts on human lives in the territory, despite the growing level of threats affecting the municipality year after year.

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