CRUZ ROJA MEXICANA

Flood Resilience Alliance

EXECUTIVE SUMMARY

Study of Flood Resilience in Localities of the Huasteca Potosina

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Executive Summary: Study of Flood Resilience in Localities of the Huasteca Potosina

Flood Resilience Project in Mexico, 2022

Zurich Flood Resilience Program

https://floodresilience.net

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Photos: PRAIM Collection, Mexican Red Cross

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Presentation

This study is based on an analysis of results of flood resilience measurement carried out in urban localities of the municipalities of Ciudad Valles, Tamazunchale and Tamuín, in the Huasteca Potosina, using the Flood Resilience Measurement for Communities (FRMC) methodology developed by the Zurich Flood Resilience Alliance (ZFRA).

A total of six studies were carried out, grouping together neighborhoods that face similar physical and social vulnerability conditions:

- In **Ciudad Valles**, two neighborhoods located along the banks of the Valles River were selected: Juárez and Tetuán, and two neighborhoods along the Los Puercos creek: Magisterial and 18 de Marzo.
- In **Tamazunchale,** four neighborhoods were selected at different locations along the banks of the Moctezuma River, including the neighborhoods: El Carmen, La Estrella, San Miguel and San Rafael.
- In **Tamuín**, two neighborhoods with a history of floods were selected: Infonavit and Las Brisas, which are located on the periphery of the urban center, closer to the Patitos Lagoon.

This paper shares key points from the flood resilience analysis and presents four priority areas for strengthening and engaging various institutions, groups and individuals in disaster risk management.

Resilience has become a fundamental concept, both in theory and in practice, for understanding disaster risk management, sustainable development and climate change adaptation. The Flood Resilience Project in Mexico (PRAIM), implemented by the Mexican Red Cross and funded by the Zurich Flood Resilience Alliance (ZFRA), takes this premise into account to strengthen the capacities of flood-affected communities.

Key issues in flood resilience

The Huasteca Potosina region is made up of 20 municipalities located in the Pánuco hydrological region, formed by the Pánuco, Tamesí, Tamuín and Moctezuma river basins. Due to its surface area of 96,989 km2 and runoff volume of 20,330 million cubic meters per year, the Pánuco river basin is one of the most important hydrological systems in Mexico (Comisión Estatal del Agua, 2016). This region registers the highest amount of precipitation in the state, an average of 1,800 mm of annual precipitation and average temperature ranges from 24° to 26°C (75° to 79°F).

Throughout its history, the population of the Huasteca Potosina has been exposed to flooding. In some areas, inhabitants mention that flooding happens every year, although the scale of the impact varies.

Key issues affecting flood resilience were identified based on the information collected, including planning for floods, the role of the natural environment and governance and community participation. Some of the most relevant points are presented in this document.

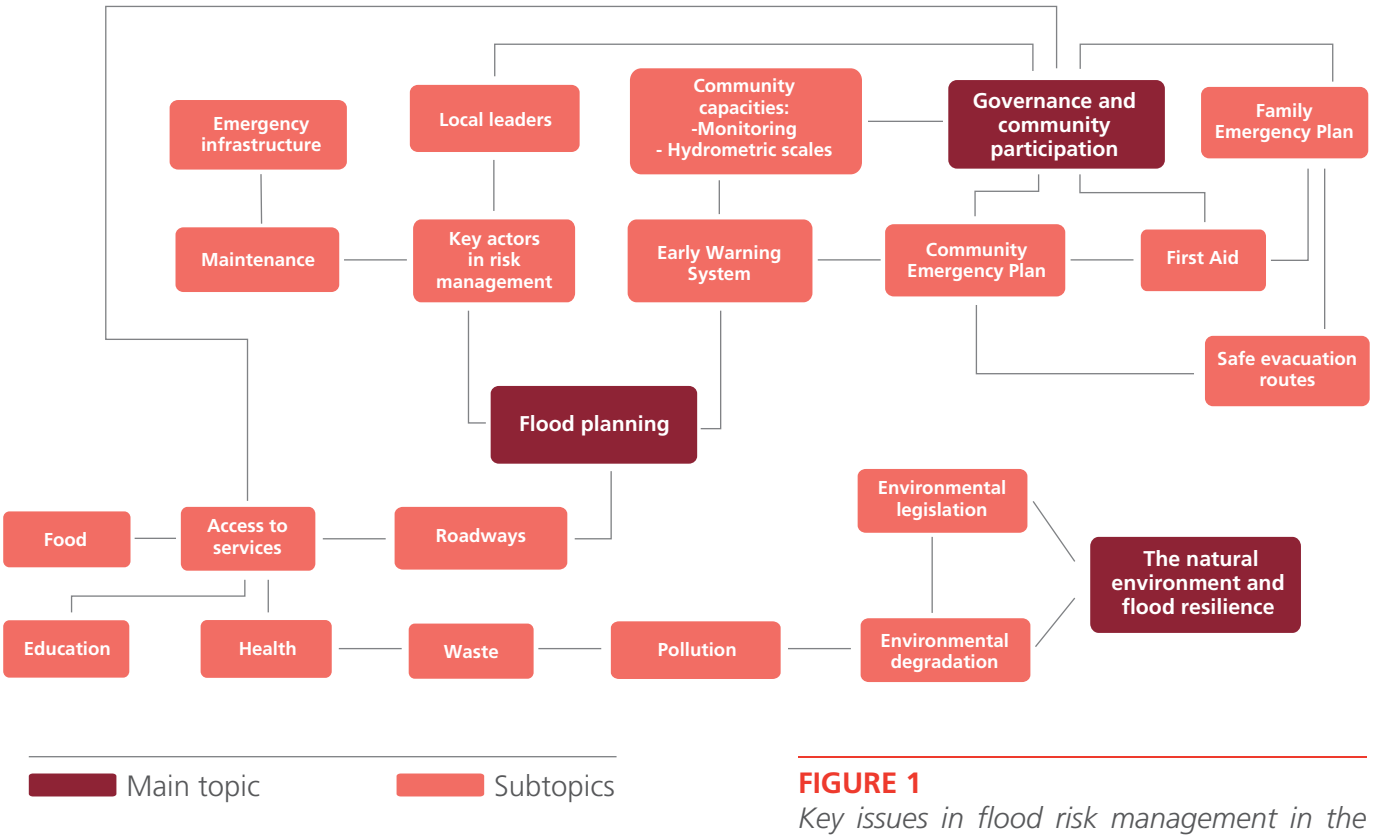

FIGURE 1
Key issues in flood risk management in the area of study.

Planning for floods.

The fundamental objective of planning for floods is to establish an organizational structure, as well as the appropriate actions to carry out before, during and after a flood, and to identify the resources available to individuals, families and communities.

- The population in this region undertakes specific actions to immediately counteract flooding, however, they have not prepared Community Emergency Plans that indicate safe emergency routes and establish the steps for a clear, organized and coordinated response to flooding.
- Short-term forecasting capabilities exist in the region, however, dissemination mechanisms at the community level are limited. While there is a river and rainfall monitoring station located in Tamazunchale, community members in Ciudad Valles and Tamuín carry out informal monitoring activities such as direct observation of the Valles River and Patitos Lagoon, and the use of hydrometric scales.
- Access to first aid knowledge varies; although some people have been trained in schools or in their jobs the majority of the population reports that they would not know what to do if someone was seriously injured.
- Electricity supply is not usually interrupted for long periods of time during flooding. In some cases, the service is suspended as a precautionary measure to avoid accidents. Some families report having alternative sources of energy that allow them to continue with their basic activities, including gas and firewood.
- In general, the population accesses medical care in neighboring suburbs or elsewhere in the municipal capitals. However, the inhabitants emphasize that road blockages, due to the concentration of water and mud, and damage to bridges, represent the greatest challenge for the population to access basic services during and after a flood.
- The disruption of roads also affects access to education. Although some school facilities are damaged and others become temporary shelters, the disruption to classes is brief and usually lasts no more than a week.
- During floods, many inhabitants report that the running water that reaches their homes is cloudy. Faced with this situation, the population takes different measures to treat water, such as via the use of chlorine, filters and boiling. The population is aware of the importance of consuming and using clean water.

The natural environment and flood resilience.

The natural environment and flood resilience are interconnected. The degradation of the environment changes the resources available to populations and increases their vulnerability by intensifying the impact of natural hazards (ISDR, 2004).

- The population perceives that the expansion of urban areas represents a threat to environmental sustainability and that deforestation and littering are two of the main actions that should be reduced.
- The concentration of litter can cause blockages in water drainage and sewage systems and limit the community's ability to divert flood water.
- Most people are not aware of the importance of the relationship between caring for the natural environment and strengthening flood resilience.
- Protecting the natural environment is prioritized in national and state laws, as well as in Municipal Development Plans, however, for the most part the importance of these actions for flood resilience is not defined. The establishment of Natural Protected Areas and environmental impact assessments also contribute to environmental protection in the Huasteca Potosina area. At the local level, the population is unaware of the legal and regulatory framework for related projects.

Governance and community participation.

Local leadership, community organization and participation are essential to establish direct and concrete communication with authorities for risk management.

- More than half of the inhabitants consider Civil Protection and the National Water Commission (CONAGUA) as authorities responsible for flood prevention and response, while also recognizing their responsibilities at the household level.
- Community members consider that local neighborhood leaders are in charge of preventing and responding to floods, however, they do not identify them as responsible for carrying out activities to strengthen resilience, such as promoting training, infrastructure maintenance, among others, to reduce the impacts of floods.
- Some families carry out independent flood preparedness actions before, during and after floods occur. Family members and neighbors spontaneously provide solidarity and support to both the general and vulnerable populations during an emergency. However, the lack of prior coordination and organization is reflected by the absence of groups or committees that represent and link the community with neighboring populations and disaster risk management authorities.
- The needs of vulnerable groups are considered by community leaders and the Municipal Civil Protection Council (includes representatives from Municipal Civil Protection, the Municipal Presidency, National System for the Integral Development of Families, and police) in municipal emergency management planning and at the time of emergency response. However, vulnerable groups do not report having participated in decision-making related to floods.
- The link between communities and risk management authorities and organizations is essential to strengthen the processes of prevention, preparedness and emergency response and thereby impact community flood resilience.

Priority actions: strengthening flood resilience in the region

A number of key areas of opportunity for collaboration were identified based on the resilience measurement study results and the framework for strengthening flood resilience, taking into account the participation of decision-makers and community groups.

1

Strengthen components of the Early Warning System

The region has official short-term forecasting capacities, however dissemination of information and warnings at the community scale is limited. The local population also undertakes direct observation to monitor the risk of flooding, however the information is only shared informally within the community. Increasing the exchange of rainfall and river level monitoring information between stakeholders will strengthen the region's monitoring network and decision-making process.

What is needed?

- A comprehensive awareness-raising program in which experts in early warning monitoring and management explain to the local population in detail, in non-scientific language, how early warnings work.
- Community-level training in the recording and monitoring of local rainfall with the aim of generating a participatory EWS network that provides information that contributes to improving the effectiveness of early warning systems.

Expected results

- Community members are better informed about the components of the early warning system and can respond more quickly in case of an emergency.
- An active population collaborates with municipal, state, and national authorities, complementing official hydrometeorological data
- The population strengthens the community components of the Early Warning System.

2 *Develop Community Emergency Plans*

Community Emergency Plans are guiding instruments that steer actions before, during and after the manifestation of a disaster, in order to provide timely attention to the affected population. This process promotes the definition of community actions to be carried out throughout each stage of disaster management, and identifies:

- Evacuation routes and safe zones.
- Resources and capacities of the community and institutions.
- Existing services and infrastructure (housing, water and sanitation, energy, access roads, telecommunications) (INDECI, 2021; UNDP/DIPECHO, S/F).

The population in the Huasteca Potosina region tends to support each other spontaneously and in solidarity among family members and neighbors. Without Community Emergency Plans that identify specific activities, the community lacks coordinated organization and decision-making in the face of flooding.

What is needed?

- Inform and train individuals, families and organizations in neighborhoods and communities on the importance of being organized and having Community Emergency Plans for the benefit of the whole population.
- Develop resources that describe the guidelines and recommendations for the implementation of Community Emergency Plans.
- Communicate the Community Emergency Plan with all stakeholders.
- Link the Community Emergency Plan with municipal and state risk reduction plans and protocols.

Expected results

- Communities have Community Emergency Plans.
- The population is organized to deal with community emergencies.
- Communities have knowledge about the hazards, vulnerabilities and capacities within their context, the institutions involved in risk management and the appropriate actions to take in the face of floods.

3 *Build capacities within the community*

Promoting flood preparedness and response knowledge and capacities at the local level is essential in order to empower the community to take immediate action before, during and after the disaster. Building capacities internally allows communities to save lives and protect livelihoods through immediate and context-specific actions. Focusing on local-level capacities provides the opportunity to coordinate local actions in conjunction with authorities and external support services and ensure greater care and impact during floods.

In the Huasteca Potosina region, some localities have a history of being isolated during and after floods and lacking access to health care. Community members rely on the capacity of their own relatives and neighbors to provide support. Acting at the local level can significantly reduce the impact of floods (SSPC, 2021: 8).

What is needed?

- Raise awareness among individuals and families about present and future flood risk in their community.
- Train people in the local context on flood preparedness and response actions, prioritizing first aid.
- Provide resources at the local level to develop family emergency plans that include actions to take before, during and after floods, considering issues such as asset protection, safe evacuation, and post-flood recovery strategies.
- Encourage the participation of the entire population, including vulnerable groups, through inclusive activities that strengthen social cohesion.

Expected results

- The community is organized, aware and trained in flood preparedness and response.
- Community members are the first responders in the event of an emergency or disaster.
- Households have emergency plans that define actions to be taken before, during and after floods.
- People at the local level collaborate to take appropriate and timely actions to reduce disaster risk.

4 *Promote the use of safe drinking water and good hygienic practices*

Water is a vital element for life and access to water is a major concern during and after a flood. In the Huasteca Potosina region, floods have caused blockages and contamination of the water supply system through pipes and wells, impacting families in flooded areas and families in areas not directly affected by the flood. In addition, the stagnation of water and the obstruction of the drainage system, due to the concentration of rubbish, has exposed the population to infections and diarrheal diseases.

Safe drinking water is essential for human consumption and for the health of the population. A resilient community has strategies in place to ensure safe water supply and to minimize water contamination.

What is needed?

- Provide information to individuals and families about measures to ensure clean water within the home.
- Promote hygiene and sanitation measures at household and community level.
- Develop strategies for the treatment of household waste during and after floods to prevent water contamination.
- Strengthen infrastructure for safe drinking water supply and identify alternative sources.

Expected results

- The population has continuous access to safe drinking water during and after floods.
- Exposure to diseases and infections due to water contamination is reduced.

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