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Safer Cities 20

Case studies on mitigating disasters in Asia and the Pacific

Community Based Early Warning System and Evacuation: Planning, Development and Testing

Protecting Peoples' Lives and Properties from Flood Risks in Dagupan City, Philippines

The PROMISE-Philippines Project opened a new door for the city to advance the culture of safety and disaster resilience by putting forward the significance of community participation. During a participatory risk assessment at the community level, it was seen that the community lacked a system for Early Warning. People in the community lived with risks and they treated this as normal. Every time it flooded, they usually raised their belongings to higher grounds and stayed in their inundated houses. When the flood level became intolerable for them, they resorted to uncoordinated self-evacuation. During emergencies, people had less time for preparing and responding, and acted on their own rather than as a community. The communities decided to prepare and plan systematically, and to help each other through floods. This is the story of how eight barangay communities and a supportive city government worked together to prepare for flood disasters.

Introduction

Communities in Dagupan City are no stranger to flooding, and for a long time have been resigned to the idea that it will reoccur, that there is not much that they can do. However, after undergoing sessions on community based disaster risk management (CBDRM) and engaging in participatory risk assessment sessions of their neighborhoods, several eye-opening concerns emerged. Apparently, the communities did not have a clear perception and differentiation of high, medium and low levels of risk. This affected the level of urgency and appropriateness of their preparedness for flooding. Second, they realized that they were vulnerable to flooding at nighttime when no one was responsible for watching the rivers and reporting water levels to the proper authorities. The communities felt they needed to assign a monitoring committee from among their members. Third, their respective Barangay Disaster Coordinating Councils (in charge of coordinated emergency response at the community level) were not oriented on their roles and responsibilities, and worse, lacked the necessary equipment and facility for emergency preparedness. Finally, the communities realized that their livelihood was in jeopardy during flooding episodes.

The community decided that they needed an Evacuation Plan to be a guide for the whole community to coordinate their efforts, and an Early Warning System to ensure that there will be enough time for preparedness. The community was expected to generate and agree upon their warning signals, and have a focal person who will be obliged to give warning signals to community people when flooding strikes. Finally, in the event of an emergency, they should have a system that promotes the effective and efficient use of their own resources, such as assigning locally available vehicles to evacuate specific groups of high-risk households to known safe areas.

Flooding: The Major Disaster Risk Faced by the City

The City of Dagupan is a fast rising urban area in the Northern Philippines. Though development promises a better quality of life for the city populace, its optimal realization remains hampered because of its high exposure to various hazards like earthquakes, fire, typhoons and most especially flooding. Stores, factories, school buildings, houses, economic activities, and, most

Abstract

This case study of Dagupan City illustrates the significance of setting up and operationalizing an early warning system and evacuation plan for flood to draw people together in pursuit of collective action towards building safe and resilient communities.

What's inside

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importantly, the lives of the people living in the high risk areas are put in a dangerous state.

The communities featured in this case study are situated along the eastern part of Dagupan City. A major river system with seven tributaries traverses this area. The said barangays are located along the tributaries that raise the community people's vulnerability and susceptibility to the devastating effects of inundation.

Since they were regularly exposed to flooding, they treated the risk as a normal part of their lives. This kind of perception poses more danger to the elements at risk in the community. However, even if the people are used to experiencing floods and typhoons, the effects they suffered were destructive when they were not prepared. Table 1 shows the relative vulnerabilities of Dagupan's 31 barangays. The barangays under PROMISE-Philippines are marked with an asterisk.

Vulnerability and Number of Households in Dagupan City — **Table 1**

Location	VULNERABILITY LEVEL		
	High	Medium	Low
1. Bacayao Norte*	353	-	-
2. Bacayao Sur*	352	-	-
3. Barangay I	-	-	139
4. Barangay II & III	-	-	573
5. Barangay IV	-	-	275
6. Bolosan	-	681	-
7. Bonuan Binloc	-	1336	-
8. Bonuan Boquig	-	2257	-
9. Bonuan Gueset	-	3291	-
10. Calmay	-	-	1055
11. Carael	-	-	1096
12. Caranglaan	-	1520	-
13. Herrero-Perez	-	549	-
14. Lasip Grande*	297	-	-
15. Lasip Chico*	211	-	-
16. Lomboy	-	-	260
17. Lucao	-	1666	-
18. Malued	-	1847	-
19. Mamalingling	-	237	-
20. Mangin*	648	-	-
21. Mayombo	-	1366	-
22. Pantal	-	3324	-
23. Poblacion Oeste	-	809	-
24. Pogo Chico	-	1075	-
25. Pogo Grande*	448	-	-
26. Pugaro Suit	-	-	778
27. Salapingao	-	-	526
28. Salisay*	380	-	-
29. Tambac	-	423	-
30. Tapuac	-	1030	-
31. Tebeng*	476	-	-
TOTAL	**3,165**	**21,411**	**47,02**

Source: CDCC Manual, 2006

The situation is similar to the experience of Barangay Hubangon in the municipality of Mahinog, Camiguin Province, where the community had experienced a heavy downpour which resulted into a flashflood, debris flow, damaged properties and casualties. A risk assessment was conducted after the disaster, and the community realized that the lack of a preparedness mechanism such as an Early Warning System (EWS) worsened the situation. The province addressed this need and they were able to test the presence of an EWS and Evacuation as essential measure to minimize the detrimental impacts of a disaster. In view of the Camiguin experience, Dagupan City was encouraged and motivated to pursue the same initiative that is parallel to the aim of PROMISE-Philippines, and this is to establish an end-to-end early warning system.

Socio-Economic Profile

Various basic social services exist in the communities to respond to the needs of the local dwellers. For their educational needs, day care centers, elementary schools and a local high school are established in the barangays, operated by both public and private sectors. With regards to the community's medical needs, each barangay has a health center that provides free check-up and medicines for the sick. The people rely upon privately-owned deep wells and on the Dagupan Water District, a government-operated structure, for their daily source of water. Privately-managed water stations are also present in the areas to provide potable water for the residents. Different forms of public transportation are available, such as tri-bike, tricycle, jeepneys, as well as private vehicles. Moreover, clear communication service is also observable and is provided by companies like Philippine Long Distance Telephone (PLDT) and Digital Telecommunications (DIGITEL).

The residents have several livelihood opportunities that include: employment in public and private institutions, engagement in agricultural and fishery production, operation of public transportation, construction work, lending and small scale ventures like *sari-sari* (variety) stores, candy-making, bakery, restaurant, junkshop and backyard livestock. Others also work abroad to sustain the needs of their families. Table 2 shows the demographic profile of the eight high risk barangays:

Demographic Profile of the Pilot Communities — **Table 2**

Barangay	Population	Number of Households	Population Density (person/ha.)	Land Area (ha.)
Bacayao Norte	2051	448	20	52
Bacayao Sur	1743	447	12	37.09
Lasip Chico	937	166	33	28.52
Lasip Grande	1318	267	30	64
Mangin	3207	641	25	126.80
Pogo Grande	3230	498	50	39
Salisay	1882	336	13	125.80
Tebeng	2359	520	16	103.20
Total	**16727**	**3323**		**576.41**

Source: Dagupan City Planning Department

Disaster Management System before PROMISE-Philippines

The City Disaster Coordinating Council (CDCC) is the primary body that oversees disaster management system. Their actions are focused on activities carried out during emergency period, involving relief distribution as well as search-and-rescue operations. Efforts on preparedness were given minimal attention thus making disaster management emergency oriented and reactive in nature.

Though disaster coordinating councils exist at the barangay level (BDCCs) as mandated by law, in most cases the members were not familiar with the responsibilities that they should take on. Like the CDCC, they responded only during emergencies. The DCCs at both the city and barangays levels function mostly because they are concurrent government officials rather than being DCC members. Aside from the CDCC and the BDCCs, there are no permanent positions for disaster risk management.

On the legislative aspect, most of the implemented laws related to disaster risk management (DRM) were on environmental protection such as solid waste management, regulation of fishing structures and mangrove re-vegetation. Ordinances on DRM were non-existent.

The city embarked on mitigation activities but, as was the case with the ordinances, these were about environmental management. One of these actions is the clean up operation in the river system conducted on a regular basis. In response to the national law known as the Ecological Solid Waste Management Act or RA 9003, the barangay residents are encouraged to keep their surroundings waste-free through the establishment and management of Material Recovery Facilities (MRFs). Through this scheme, collection and proper disposal of solid waste materials are led by the barangay excluding the residuals (i.e. busted bulbs, computers, medical wastes) which are collected by the city.

Moreover, mangrove re-vegetation is held quarterly and tree planting is done three times a year or as often as the barangay schedules permit. The barangays have their own initiative in pursuing the greening activity provided that the City Government gives support in the form of seedlings and technical assistance. The labor and regular maintenance come from the local people themselves.

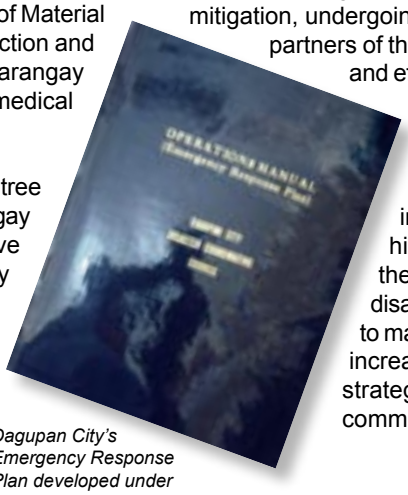
The maintenance of creeks and canals are also part of their initiative, with a food-for-work component to encourage community participation. Rice was provided to those residents who are actively involved in keeping canals and creeks free from waste materials that obstruct the free flow of water. Despite these ecologically-sound undertakings by the communities, the City Government was always viewed by the people as the remedy to all their problems. Self-initiative was lacking among the local people, even among the members of the Barangay Council who were highly dependent upon the assistance of the city.

It is very positive that the city government was already taking steps to organize and systematize their response to disasters. However, the city recognized the need to have a comprehensive risk reduction plan before, during and after a disaster, and that it was crucial to have systems in place such as an Early Warning System and Evacuation Plan for Flooding.

PROMISE-Philippines for Local Preparedness

The Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities in Asia (PROMISE) aimed to reduce the vulnerabilities of high-risk communities and increase the capacities of the city government. The approach called for identifying viable preparedness and mitigation measures, Community-Based Disaster Risk Management (CBDRM), and good governance. The project team was composed of the City Government of Dagupan as local partner, the Center for Disaster Preparedness (CDP) as implementing agency, the Asian Disaster Preparedness Center (ADPC) as regional coordinating organization and the U.S. Agency for International Development (USAID) as donor. A dedicated Technical Working Group (TWG) was created to focus on disaster mitigation, undergoing capacity building to make them effective partners of the communities towards disaster mitigation, and effecting institutional changes to root disaster mitigation firmly within their work.

There were four objectives that the project aimed to achieve at the end of the two-year implementation period. This case study will highlight two of the project objectives: (1) the adoption of specific hydro-meteorological disaster preparedness and mitigation measures to manage the said risks by stakeholders; and (2) increase their involvement and further enhance strategies, tools, and methodologies related to community preparedness and mitigation.



Dagupan City's Emergency Response Plan developed under PROMISE-Philippines

Steps for Having an Effective EWS and Evacuation Plan

The first step to make an EWS and Evacuation Plan was a training session on EWS and Evacuation Plan given to the TWG and BDCCs to guide them in crafting their plans. The main facilitator was Ms. Mariser Palencia, and resource persons came from the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) and Philippine Institute of Volcanology and Seismology (PHIVOLCS). The TWG also went to the PAGASA Flood Control Office to learn the flood control system of their river basin, and how the flood forecast was relayed to affected cities and municipalities. The following were considered in making the EWS and Evacuation Plan:

- Identify the lowest areas in the communities that get easily inundated.
- Determine the number of flood markers needed in the community as basis for the EWS.
- Assign appropriate locations for the flood markers and put the flood markers in place.
- Identify the pick up points and safe routes for evacuation.
- Select safe evacuation centers for the vulnerable families.
- Delegate roles and responsibilities among the Evacuation Management Committee.
- Validate the EWS with the people and made the necessary revisions.

Participatory Risk Assessment

To raise the capacity of the community to deal with disaster risks, a three-day training session on CBDRM and participatory risk assessment (PRA) was held in the eight high risk communities to enhance the people's knowledge, skills and proper attitude regarding CBDRM. This served as the leveling-off activity for the participants from the community and the TWG facilitators. The participants of this training came from various sectors including men, women, children,

youth, senior citizens, as well as key persons and leaders from the barangays including the BDCC members and the Barangay Council.

The trainees were expected to spearhead CBDRM in the community. The activity resulted in a community risk assessment that identified the elements at risk and were given priority for community planning.

Children's understanding of their behavior before, during and after floods.

The assessment paved the way for the pilot barangays to have a comprehensive and efficient disaster risks analysis. The local people were able to track down the various flood disasters that their communities had endured since as far back as they could remember. This enabled them to see the changes that occurred over time.

Another important output of the local people is the risk maps that highlight the elements at risk as well as the resources they can utilize to deal with their vulnerabilities. From a collective and careful study of their risk, each barangay had pointed out in detail the number and location of households that suffer the most deleterious impacts, the location of social services that they can access in times of need, safe routes which they can use during emergencies, evacuation centers that will provide them with temporary shelter (i.e. schools, church and gymnasium), and the host families who can offer their houses to the affected people.

Prepare and Implement an Action Plan in the Communities

Action plans were drafted immediately after the community risk assessment to enable the people to plan feasible risk reduction activities that can be implemented in their communities within a short period of time. The plan consists of activities to be done before, during and after a disaster. Eventually, this plan after validation with other community members becomes the CBDRM Plan. Each of the eight high- risk barangays made a CBDRM plan. The Early Warning System and Evacuation Plan was determined to be a major part of the CBDRM plan. The community plans became the basis of the city-wide CBDRM Plan.


Typical action planning session in one of the communities.

The participatory risk assessment showcased different vulnerable elements present in the pilot communities, and so the local people were persuaded to come up with feasible and responsive activities that will help combat their at-risk state. The well thought out plan of action was developed in a series of meetings and brainstorming sessions.

The city-wide CBDRM plan provided a framework among the barangays on how to systematically deal with the factors that increased their susceptibility to the harmful effects of flood episodes. It became instrumental for them to have a clear overview on their vulnerable situation and the capacities available to cope with it. The plan served as a catalyst for the people to become familiar with the transformation of the city's face with the passage of disasters, featuring the losses of the affected population, resource destruction and economic displacement. The past disaster coping mechanisms practised by the locals were also underscored. Having these as a background, the people have crafted their Early Warning System and Evacuation plans as part of their CBDRM plan in order to put a mechanism in place towards the advancement of culture of safety in the communities.

These schemes provided them with guidelines to follow before, during and after a disaster, to ensure that their lives and their properties are kept safe. Areas for evacuation, safe pick up points, safe evacuation routes, and logistical requirements for evacuation were included. The plan outlined the communication flow among partnering organizations to guarantee coordinated efforts and actions. Mechanisms were laid down on how information will flow and who were the people in charge.

The plan emphasized approaches and strategies to reduce risk, to be undertaken in partnership with various institutions, such as the local government unit, government agencies, religious groups, media, business organizations, non-government organizations in the local and international community, and other members of the civil society. Their contributions in terms of financial, technical, social and human aspects were identified, and the delineation of roles among them was ensured as well. Committee assignments were made to assure equal division of labor and the efficient accomplishment of tasks. Part of this was the revamp and strengthening of the BDCC organization.

Capacities were assessed for emergency response by the city and the eight pilot barangays, and CDP and the TWG collaborated with the Philippine Red Cross for training on Emergency Health and First Aid held on March 2007 for 30 participants. In addition, ADPC conducted a Community-Based Emergency Response Course for the Dagupan City Staff on July 2007, co-facilitated by the Pangasinan Red Cross.


Emergency response training for volunteer responders

Features of the Action Plan **Box 1**

- The Dagupan City Profile
- City Disaster Situation Analysis
- Current Disaster Risk Management Practices
- Disaster Coordinating Council Operational Guidelines
  - Mission
  - Purpose
  - General Objective
  - Specific Objectives
  - Disaster Response Strategies
    - Adopted Warning Systems
    - Evacuation Procedures
    - City Disaster Operations Center
- City Disaster Coordinating Council
- Barangay Disaster Coordinating Council
  - Evacuation Center Management Strategy
    - Organizational Partners
    - Communication and Information Flow

Reactivation of the BDCCs

One of the urgent issues that emerged from the risk assessment that needed immediate action was the inactivity of BDCC in emergency preparedness. PROMISE-Philippines became instrumental to push the members to perform their roles and responsibilities. The following are the steps carried out to succeed in this initiative:

- Clarifying the Organizational Structure of the BDCC
- Identifying the responsible persons assigned in each committee

- Discussing the various functions and responsibilities of the BDCC members
- Designing a Communication Flow for BDCC actions
- Conduct of CBDRM Training and Community Based Emergency Response Course
- Inventory of the existing equipments and procurement of additional gadgets for emergency preparedness.

Testing the Waters: City-Wide and Barangay Mangin Flood Simulation Exercise

Full evacuation at Barangay Mangin during the simulation exercise.

A city-wide and barangay-level flood response exercise was conducted in May 2007 to test the EWS and Evacuation Plan. A simulation exercise, sometimes called a simulation or drill, is a controlled, scenario-driven activity used mainly for training or assessing personnel, or for testing, training and evaluating processes or capabilities. This activity was facilitated to check the appropriateness and feasibility of the flood preparedness plans prepared by the people. Approximately 300 eager individuals who took active part in the event were from the community, city government, regional government offices, international non-government organization, religious groups, neighboring municipalities, health organizations, media and civil society.

Through the actors' well-coordinated efforts, the event became a big step towards the realization of their vision. The exercise was staged in two levels: at city-level with scenarios of road accidents, and at barangay-level with an evacuation at Barangay Mangin. Subsequently, other flood response exercises were made to test communication flows, search- and-rescue, and flood monitoring.

The assessment was attended by different stakeholders, actors, observers including representatives from the neighboring cities and municipalities like Baguio and Mangaldan, Mr. Anup Karanth of ADPC, and the Regional Disaster Coordinating Council Director Armando Duque and the control group. Valuable suggestions were collated from the discussions to improve the EWS and Evacuation Plan. The general assessment was that the drill was good, and they were able to test the EWS and Evacuation Plans of the City and of Barangay Mangin. The drill revealed some of its strengths and weaknesses.

Steps to conduct the exercise **Box 2**

- The EWS and Evacuation Plans prepared by the eight high risk communities and the city were reviewed
- The baseline data used in the EWS with the community people was validated
- A control group from the TWG was formed
- A script was drafted for the exercise
- A series of meeting was done with stakeholders like Red Cross, Bantay Dagupan, PATRIMA (media group), Rover Scouts, CDCC and others for further development of the scipt, for tasking, for identifying the actors and participants.
- Finalization of Script
- Preparation of Staging areas
- Briefing Mangin BDCC and Dagupan CDCC
- Assigning and inviting Observers from neighboring Cities and municipalities as well as the Regional Disaster Coordinating Council
- Soliciting Technical Advice from ADPC
- Actual Conduct of the Exercise
- Assessment and Evaluation of the exercise and the whole EWS and Evacuation Plan
- Revision of plans based on the assessment and evaluation

The identified strengths included the following:

- It was able involve all sectors in the community as well as in the city. It was noted that the women actively participated in the simulation.
- Full evacuation was achieved.
- Monitoring of flood water level was performed by the BDCC, and the updates were relayed to the CDCC.
- The information board in the EOC showing updates in the simulated flooding and response in the city proved to be useful. The standard content should be: number of families; barangays affected; casualties; number of people in evacuation centers; extent of damage in agriculture, livelihood and infrastructure; phone directory of focal persons and line agencies. The RDCC recommended that the board be made a permanent fixture at the offices of the CDCC and BDCC.
- Worst case scenarios made the drill more realistic.

The identified weaknesses or points for improving the EWS and Evacuation Plans included the following:

- Delayed communication between CDCC and BDCC.
- Communication flow/coordination between the rescue team from CDCC and BDCC was unclear, and affected the efficient dispatching of equipment to the rescue area.
- No emergency hot line for disaster events.
- No back-up for the communication system.
- A review of roles and responsibilities at every stage of crisis is crucial.
- Documentation of EOC activities and proceedings needs improvement.
- Use topographic and hazard maps rather than satellite maps.

Comments from observers included the following:

- Establish the EOC within 24 hours after a typhoon strikes the city's area of responsibility.
- In selecting the location of EOC, the following are factors to be considered: space, staging area, placement of signage for proper identification.
- Clarify/ identify tasks and responsibilities of individual supporting staff.
- Isolate the Communication Room inside the EOC from other rooms (meeting room, media room).
- A Contingency Plan for specific disasters must be prepared and made available.
- In conducting activities like this drill, it is important to indicate that it is just a simulation exercise to avoid confusion among community people.
- Data in the media room must be updated from time to time.
- Establish a permanent EOC.
- Maintain an ambulance and rescue trucks dedicated to emergency response.
- Aim the next exercise at a bigger goal.

After the exercise, the city government along with the eight pilot barangays were able to showcase their knowledge and skills in emergency response through role playing during study visits of organizations from the international community which highlighted the activities performed by the Water Search and Rescue Team of the city and the Community-Based Emergency Response (CBER) Team. Such organizations include the CARE Bangladesh under the SHOUHARDO Program and Oxfam Hong Kong.

Small-Scale Disaster Mitigation Projects

Early Warning Systems and Evacuation Plans work best within a bigger program for disaster mitigation. Aside from these, the communities were hard at work at ensuring their preparedness for flooding, and mitigating its impacts.

Community-run rice retailing

Provision of Emergency Preparedness Equipment at the Barangay Level

To further strengthen and inspire the Barangay Disaster Coordinating Councils, necessary gadgets were given out to the eight pilot barangays during the first phase of project implementation. These included boats, bamboo raft, road guides to demarcate safe routes that avoid open canals, flashlights, hard hats, raincoats, boots, ropes, megaphones, emergency lamps, indigenous warning devices (*kanungkong*), two-way radios for citywide communication, camera, radio transistor, heavy duty lamp, farm tractor and others. The distribution was based on each community's needs.

Furthermore, each barangay had its own counterpart in equipping the BDCC. They bought some of the emergency equipment from their barangay funds and other sources, such as flashlights, two-way radios, megaphone, and others. The project filled in the resource gap as needed, and the needs varied from one barangay to another.

Economic Mitigation

In response to the possible disruption of the livelihood of the vulnerable population during floods and other hazards, the provision of alternative livelihood options also became a priority. After a tedious process of screening and approval of proposed small-scale disaster mitigation projects, they were able to venture into different income-generating activities depending upon the submitted proposal of each community. Some communities have embarked on rice retailing business while the others engaged in tri-bike operation. Small income-generating projects through lending were also undertaken. The said small scale economic mitigation program was intended to create income for the vulnerable population and generate funds for the maintenance of the given emergency preparedness equipments and gadgets.

Structural Mitigation

After consulting the pilot communities, reviewing the results of the risk assessment and considering the suggestions from ADPC and other stakeholders, the following structural mitigation projects were deemed necessary to lessen the detrimental impacts of flooding: elevation of the Emergency Operation Center (EOC) which also serves as the temporary evacuation shelter or holding areas for the affected households; elevation of toilet of the EOC; transfer and improvement of EOC; barangay dike; and renovation of toilets in the school/evacuation center

Most of the structural mitigation projects were identified by the community people during the PRA and selected during action planning. Currently, the eight pilot barangays have various processes and mechanisms in choosing their priority for their final structural mitigation project. Barangay Mangin in particular included the consultation and approval of the project through the Barangay Assembly. Others had decided through the urgent need of the BDCC and the community based from their previous flood experiences. In general, the community people's needs and interests were considered in choosing projects. Some of the other actions needed mitigate disasters in the communities can already be done by the local people themselves without external assistance.

City-Level Actions

The sustainability and dissemination of the communities' efforts were enhanced by the receptivity of the city government to flood disaster mitigation. This was seen in their active roles within the project.

Formation of the Technical Working Group (TWG)

When the project began in 2006, it was deemed necessary to create a TWG out from the existing City Disaster Coordinating Council (CDCC) to advance the aim of flood disaster preparedness. The strategy was to form a multi-disciplinary group composed of heads and staff from various departments, namely: City Agriculture Office (CAO), City Health Office (CHO), Waste Management Division (WMD), City Information Office (CIO), City Social Welfare and Development Office (CSWDO), City Tourism Office (CTO), City Engineering Office (CEO), City Planning and Development Office (CPDO), Department of Interior and Local Government (DILG), Bureau of Fire Protection (BFP), and the Public Order and Safety Office (POSO). The TWG was created to work closely with the local people, and retained a balanced understanding of urban development from the different issues and concerns of the afflicted communities.

The TWG was divided into three facilitating teams, and were assigned to oversee activities of two to three of the eight pilot communities, help them organize themselves and do CBDRM in their localities. The members of the TWG facilitated and guided the people to choose appropriate and feasible risk reduction measures like the creation of the Early Warning System and Evacuation Plan.

Conduct of a Community Based Disaster Risk Management and Participatory Risk Assessment (PRA) Training of Trainers (ToT) for the TWG

Prior to the project, the members of the TWG had neither an orientation on nor familiarity with disaster risk management. Their capacities were limited to their respective department's technical skills and expertise. To prepare them for their functions in the communities, the TWG members underwent a seven-day CBDRM and PRA ToT facilitated by CDP. From this training, they were equipped with the skills necessary to conduct CBDRM-PRA trainings in the communities. The TWG members later identified the training as a big stepping stone to fostering awareness and developing skills on disaster preparedness. The TWG gave a series of simultaneous trainings in their respective areas. The major output drawn from the said training is the community risk assessment where the need for an Early Warning System and Evacuation Plan arose.

The content of the training was based on achieving the following competencies:

1. Cite the local disaster situations of Dagupan City

2. Enumerate and explain basic concepts of CBDRM such as disaster, hazard, vulnerabilities, capacities, risk, and the rights-based approach
3. Explain disaster management and the community-based disaster management approach
4. Explain the programs/services, policy, task and responsibility of disaster management office of the government
5. Demonstrate skills in disaster preparedness and mitigation
    a. Community Risk Assessment
    b. Risk Reduction Measures
        - Formation of Community Disaster Management Organization
        - Early Warning System
        - Evacuation and Evacuation Center Management
        - Environmental Protection including Waste Management
        - Public Awareness
        - Networking
6. Demonstrate skills in emergency response
    a. Emergency Operation Center Management
    b. Damage, Needs and Capacities Assessment Report Writing
    c. Relief Delivery Operation
7. Enumerate and explain the disaster management plan of one's own community
8. Explain the important considerations and processes involved in managing a community training
9. Develop a specific CBDM training design and lesson plan for the community-level training
10. Develop an action plan

Local Legislation to Promote Disaster Risk Management

Resolution No. 5469-2006 declaring July 16 as Dagupan City Disaster Safety Day was passed by the *Sangguniang Panlungsod* (City Council) in collaboration with the TWG to commemorate the devastating 1990 Luzon earthquake and promote disaster preparedness. The observance of the resolution has been in the form of awareness-raising activities: Academic Olympics in schools in Dagupan and its neighboring municipalities, mangrove re-vegetation, earthquake drills, tree planting, and DRM orientation seminars for institutions and other stakeholders. Former City Councilor Alex P. de Venecia authored the said resolution.

Realizing that disaster preparedness is fundamental and that a permanent mechanism is needed to champion safe communities, the city council passed City Ordinance No. 1908-2007 to establish a permanent Emergency Operation Center (EOC) in the city. The ordinance was authored by City Councilor Farah G. Decano, Head of the Local and International Affairs Committee, and was passed by a newly-elected *Sangguniang Panlungsod* on 10 December 2007. The ordinance also expanded the city's concept on hazards to include natural hazards such as tsunami, earthquake, and drought, as well as man-made hazards.

Fielding calls, one of the tasks of an EOC, was practiced during the simulation exercise.

The EOC will be manned by three regular staff and an EOC Manager. The EOC will function 24 hours a day, seven days a week, responding not only to emergencies but also ensuring public order and safety in the whole city. Its activities include the provision of assistance to public commuters, information drives, and capacity building on DRM. The EOC team is made to be part of the CDCC structure. It is believed that setting up an EOC will help make the Barangay and Citywide Disaster Risk Management Plans sustainable.

The PhP 2,000,000 (USD 46,000) operating budget of the EOC will come from the annual budget of the City Government. PhP 8,000,000 (USD 185,000) will be allotted for the construction of the structure and purchase of necessary equipments for the first year of implementation. The money for emergency response will come from the local calamity fund that is an annual lump sum from the city's budget, at a fixed rate of 5% of the regular income source of a city or municipality (a provision under the 1991 Local Government Code).

Calibrated pole for measuring the stage (water height) of Dagupan rivers

Disaster Information Management Systems (DIMS)

The city encouraged the eight pilot communities to record flood water levels regularly to have baseline data for the DIMS in the future. The city for its part performs a continuous updating of the data required for risk assessments (affected population, number of houses, social services, critical facilities and existing economic means). The data collected from the pilot communities serves as basis for making decisions on EWS. Furthermore, the alert level in their EWS both in the city and barangay will be based on or calibrated upon the recorded flood water levels. Finally, the city will develop a DIMS application on their geographic information system to systematize their efforts.

Recommendations for Replication

- The commitment and willingness of the Local Government to support the endeavor can facilitate the replication of the project.
- The dedication and initiative of the community would help in duplicating the project in other vulnerable areas.
- Collective learning on CBDRM of the LGU and communities is essential.
- Mobilize the various stakeholders to gain the active support from civil society, other local government institutions and communities. essential.

Lessons Learned

- If people are well-informed about the concept of disasters and early warning system they will cooperate knowing that these will protect them from any adverse effects of disasters.
- Community mobilization moves actions faster because it gives a common frame of reference, appreciation, and it puts a system in place.
- Flood Response Simulation can test the plans and show its strengths and weaknesses. Delineation of tasks, multi-sectoral participation and articulation of suitable responses were challenges that the activity have tried to address.
- The simulation exercise helped each sector involved to share their knowledge and skills in preparedness and response through allowing others to witness, impart comments and eventually replicate this kind of endeavor. It became a venue for all to learn from actual practice.

Further References

Asian Disaster Management News: Emerging Risks and Approaches for Reducing Vulnerability of the Urban Built Environment , May-August 2007, pp. 7-8

UNISDR Building Disaster Resilient Communities: Good Practices and Lessons Learned, June 2007, pp. 46-48

Other Relevant Safer Cities Studies

SC 16: *Cooperation between Local Authority and Communities*
SC 18: *The Boy Who Cried, "Wolf!" or Why a Community-based Alert System is a good idea.*

About the Project

PROMISE-Philippines was a two-year project whose goal is the reduced vulnerability of the urban communities in the Philippines through enhanced preparedness and mitigation of hydro-meteorological disasters. The activities planned for PROMISE- Philippines include:

- Barangay-level disaster preparedness and mitigation planning to reduce vulnerability
- Implementation of CBDRM projects at Barangay level and documentation of case studies.
- Development of community-level livelihood options for individuals and small enterprises
- Organization of functional BDCC
- Pilot testing of community-based flood forecasting and warning system in coordination with PAGASA
- Development of preparedness and mitigation plans using improved hazard data and information available at the city
- Policy workshops to discuss policy changes and direction, improvement to city ordinances
- Trainings/capacity building programs, public awareness and advocacy campaigns

PROMISE-Philippines has the following partners:
Center for Disaster Preparedness
Dagupan City Government
US Agency for International Development/Office of Foreign Disaster Assistance (USAID/OFDA)

About the Partner

The Center for Disaster Preparedness (CDP) is a center committed to disaster risk reduction and protection of life, property and the environment, CDP assists both service providers and vulnerable groups in developing their capacities in community based development oriented disaster risk management (disaster preparedness, mitigation, emergency response and recovery) through training, research, advocacy, program design and evaluation and facilitation of inter active learning on disaster risk management.

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Technical Working Group, Mrs. Emma J. Molina, City Agriculturist, Focal Person for PROMISE-Philippines
8 Pilot Communities of PROMISE-Philippines: Bacayao Norte, Bacayao Sur, Lasip Chico, Lasip Grande, Mangin, Pogo Grande, Salisay and Tebeng.
Mr. Benjamin S. Lim, Mayor of Dagupan City, 2001-2007

Photo credits: PROMISE-Philippines

***Safer Cities** is a series of case studies that illustrate how people, communities, cities, governments and businesses have been able to make cities safer before disasters strike. The series presents strategies and approaches to urban disaster mitigation derived from analyses of real-life experiences, good practices and lessons learned in Asia and the Pacific. This user-friendly resource is designed to provide decision-makers, planners, city and community leaders and trainers with an array of proven ideas, tools, policy options and strategies for urban disaster mitigation. The key principles emphasized throughout Safer Cities are broad-based participation, partnerships, sustainability and replication of success stories.*

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PROMISE

During the implementation of the Asian Urban Disaster Mitigation Program (AUDMP), ADPC recognized the importance of interventions in urban areas and accordingly identified Urban Disaster Risk Management as one of its five core thematic areas of work, experiences from which have also guided the selection of the target secondary cities. ADPC has developed 'Strategy 2020 for Urban Disaster Risk Mitigation in Asia' which aims to reach 200 cities by the year 2020.

The need to minimize the destructive impacts of these hydro-meteorological events on the vulnerable communities, particularly the urban communities and the economic infrastructure through enhanced preparedness and mitigation is therefore the main thrust of the present intervention in implementation of the Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities in Asia (PROMISE).

ADPC considers PROMISE program as an opportunity to associate with many communities living in Asian cities vulnerable to hydro-meteorological hazards with the aim of reducing the impacts of such events and demonstrate innovative applications for community preparedness and mitigation.

This case study documents efforts under a specific program objective:

- *Increased stakeholder involvement and further enhancement of strategies, tools and methodologies related to community preparedness and mitigation of hydro-meteorological disasters in urban communities.*
- *Effective local disaster risk management by local authorities is first related to many development activities. These measures are preventive in nature, and attempt to reduce people's vulnerability to disasters. They are also diverse, complex, and interactive, and are not always recognized by local and national authorities who are accustomed to responding to emergencies and reducing exposure to the hazards that bring about disasters.*

The Asian Disaster Preparedness Center (ADPC) is a regional resource center dedicated to safer communities and sustainable development through disaster risk reduction in Asia and the Pacific. Established in 1986 in Bangkok, Thailand, ADPC is recognized as an important focal point for promoting disaster awareness and developing capabilities to foster institutionalized disaster management and mitigation policies.

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