Dagupan

The city of Dagupan takes a leading role in The Philippines in building up a culture of safety and disaster resilience with participation by all stakeholders and with a complementary role played by the local community. In this process, the city closely works with local NGOs, League of Cities, Dept. of Interior Local Govt. unit, District Disaster Councils etc. Out of the NGOs, a major role is played by The Center for Disaster Preparedness, (CDP) with the technical guidance from ADPC. The CDP is a center committed to disaster risk reduction and protection of life, property and environment. CDP assisted the Dagupan in developing capacities of the officials and community in community based development oriented disaster risk management, through training, advocacy, program design and facilitating interactive learning on DRM.

1. City: Dagupan, Philippines

Dagupan City is located along the seacoast and at the eastern margin on the delta of Agno River. It lies one meter above sea level and Pantal River flows through the city. The present active channel of Agno River traverses the western boundary of Pangasinan and empties into Lingayen Gulf. Dagupan is a sub-regional center for trade and commerce, finance, high-level health and education services of Region 1 in Northern Luzon.

Total Population	- 145,326
Total Land area	- 4008 hectare
No. of Barangays	- 31
No. of households	- 28,941
Population density	- 2,931
Employment Generation	- Fisheries-11.88%, Construction and Manufacturing -16.94% and Service sector -71.09%

When considered with Social Development indicators, 96% of household have access to piped water, 95.63% of household have access to electricity, 87.80% of have enrollment in primary and secondary school, 30% of households are below the poverty line and 91.7% live in formal housing.

2. Name of Mayor:

Alipio F Fernandez, Jr.
City Hall complex, A B Fernandez Avenue, Dagupan city
al.fernandez.jr@dagupan.gov.ph
tel +63 75 515 4343 and +63 917 247 8709

3. Disaster Risks (major disasters, occurred, prevailing hazards, vulnerable conditions)

Floods: Flooding occurs due to the exit point of the two bigger river systems in Pangasinan – the Agno and the Toboy-Tolong rivers and by the onset of high tide. Tidal backflow has created secondary rivers that in turn made islets out of the eastern Barangays of Mamalingling, Bolosan, Tambac, Manguin and Salisay. There are seven river systems that traverse Dagupan, all of which drain out to the Lingayen Gulf.

Storm surges: Some of its Barangays are also prone to storm surge that usually occur around the mouth of Pantal River.

Typhoons: Typhoons are responsible for heavy rains in the upper catchment and subsequent flooding in the city.

On 17 May 2007, Typhoon Halong (local name Cosme) hit Dagupan City resulted with 4 deaths, severe damage to 3,349 houses, and partial damage to 15,034 houses and affected 24,973 families. Damage to public infrastructure was at USD 0.69 million. There was no rain in Dagupan, but the city had some flooding due to dam water release and high tide. Estimated losses for the local fishing industry were at USD 13 million.

On 8 October 2009, Typhoon Parma swept through Northern Luzon making over 500 casualties and at least PhP 7 billion-worth of damage to properties. The worst flooding in their history submerged Dagupan City. Loss and damage to the city were concentrated in the fisheries sector at P471,490,000.00, but with zero casualties due to existing disaster preparedness measures.

Liquefaction and ground shaking: On 16 July 1990, due to North Luzon earthquake of 7.8 magnitude, 1,230 houses destroyed, 6235 houses partially damaged, 47 buildings and 2 bridges collapsed and 80 percent of roads damaged.

4. Progress and Results (main areas of progress, based on 10 essentials)

The Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities (PROMISE) was implemented in Dagupan from March 2006 to July 2009 by the Asian Disaster Preparedness Center with the funding support from USAID/OFDA and The Center for Disaster Preparedness (CDP) of The Philippines as the local partner. Through PROMISE, the city has adopted mechanisms for reduce the vulnerabilities for disasters and build up safer communities. Originally, PROMISE was implemented in eight Barangays: Bacao Norte, Bacayo Sur, Lasip Chico, Lasip Grande, Manguin, Pogo Grande, Salisay and Tebeng.

1) Organisation and Coordination:

Prior to the ADPC project, in Dagupan City, City Disaster Coordinating Council (CDCC) was active on disaster response systems and the system was primarily reactive in nature and did not have a comprehensive risk reduction plan in place. Communities were dependent upon city and national authorities on relief and welfare assistance during flooding and other disaster events. In 2006, a Technical Working Group was created to focus on disaster risk reduction and to work closely with local communities and other stakeholders including non-governmental organizations and international agencies. The TWG comprised of members from the CDCC, Barangay Captains and representation from city offices of Bureau of Fire Protection, Agriculture Office, Engineering Office, Health Office, Information Office, Planning and Development Office, Public Order and Safety Office, Social Welfare and Development Office, Tourism Office and Waste Management Division.

Major components of the process of disaster risk reduction are hazard, vulnerability and risk assessment, mitigation and preparedness, training and awareness, advocacy for mainstreaming DRR in urban local governance. All the decisions on action plans, strategies, implementing of actions, implementers, periodical updates, coordination with other external bodies etc. are carried out by TWG after discussions at periodical meetings. Implementation of activities is executed by various teams as relevant. The introduction of the emergency plan which was prepared collectively with the community, made them to become concerned with early warning and evacuation building a culture of safety. Civic groups and private entrepreneurs would also contribute to the execution of different parts of the emergency plan, either as trained rescue volunteers, crowd control, or providing relief goods. The local print and radio media in the province were also briefed on the city and barangay emergency plans, and they participated in public awareness drives.

Community participation is visible in every aspect. It was planned and tested for each of the eight barangays should be self-sufficient for at least three days as part of their flood disaster preparedness. The communities were encouraged to have enough relief goods in stock, to be prepared to evacuate themselves, to rescue themselves, and to know first aid to be prepared for an

extreme situation where the emergency response from the city, provincial or national government are severely strained.

During the typhoon Cosme in 2008, the city and barangay disaster coordinating councils were all activated, and the flood early warning system was monitored non-stop. Barangay Mangin had the highest flood risk, and yet it managed to evacuate its residents, distribute its own relief goods in addition to the relief goods from the City, and ensured that all its residents were reached. The city's relief work and the Dagupan Red Cross began immediately after the typhoon passed, as well as recovery efforts to purify water, clear roads and restore water and electrical services. It would seem that the city and barangays were able to work well together for early warning.

During Typhoon Parma in 2009, City was submerged by the worst flooding in Northern Luzon history and at least PhP 7 billion-worth of damage to properties. Other cities and municipalities were also badly affected by floods that came from a combination of rain from Typhoon Parma and emergency dam water release. Unlike the neighboring localities, Dagupan City was well prepared even before the storm entered the country and had no casualties because of its CBDRM work in spite of being entirely covered in floodwater. The eight high-risk barangays had undergone two pre-emptive evacuations triggered by the end-to-end flood early warning system; this system was previously reinforced by community-based disaster risk management processes, several evacuation drills and flood simulations. Dagupan City government was therefore able to concentrate on the medium- and low-risk barangays, since the weeklong flood managed to cover the entire city at one point. The BDCCs were able to prevent death and major damage while waiting for other rescuers to reach their areas during the crucial hours. The city's EOC had to manage 18 evacuation centers sheltering 155,000 people, and some high-rise buildings that became temporary shelters for 30,000 people. The evacuation centers, in turn, in the eight barangays were prepared with supplies, they continued to monitor survivors' relief needs and convey the data to the city government for them to put out an appeal for additional relief.

2) Assign a budget :

Dagupan City Government took a proactive step and lobbied its city council for the establishment of an EOC. On 10 December 2007, a newly-elected council Dagupan City Council passed City Ordinance No. 1908-2007 that mandated the establishment of a permanent Emergency Operation Center (EOC) in the city as an institution tasked to mitigate the adverse effects of any impending disaster. The EOC is manned by around three regular staff and supervised by an EOC Manager. It responds to emergencies and ensures public order and safety in the whole city, functioning 24 hours a day, seven days a week. The ordinance allocated PhP 2,000,000 (USD 46,000) for the EOC operating budget out of the annual budget of the City Government. It also provided for PhP 8,000,000 (USD 185,000) for 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 set up in each of the barangays and each city as part of national policy. The money includes an annual automatic setting aside of 5% for disaster preparedness from the barangay or city funds for development work. This fund grows every year if it is unused for an emergency.

3) Prepare Risk assessment

Risk assessment was also a part of participatory approach adopted by the Dagupan city. Eight barangays were identified as at high risk to flooding, based on the frequency and severity of flooding, flood depth, and the length of time that a flood would stay the city government proposed to work on the high-risk communities as the pilot for their CBDRM activities.

Participatory hazard and vulnerability mapping with the subsequent participatory risk assessment are carried out using participatory tools and trained volunteers to facilitate inputs from a wide range of community stakeholders. At the municipal level, the assessment is integrated into other

municipal maps, such as land use, human settlement data, etc. using GPS and GIS technology. The assessment process paved a way to BDCCs to transform from mere emergency response coordination bodies to local risk management committees. When the barangays are not facing a crisis, they are updating their list of households and the risk to floods, refreshing their inventory for relief, training people in search-and-rescue, briefing children and new community members on the flood alerts, and cleaning their drains in preparation for rainy season. The trained volunteers of the barangay who were monitoring flood gauges in rivers and flood markers in their communities were relaying data to the city government on depth, date and time of reading, flood duration and extent. This voluntary community effort is continuing up to today.

Based on the risk assessment, communities were guided by the project to develop their own appropriate mitigation projects and activities to reduce the identified vulnerabilities. The mitigation measures executed were: (1) With the help of the city government, development of evacuation plans with appropriate responses per flood level. (2) Establishing a community flood alert system with the corresponding system development at the city level and coordination with the national meteorological service, to make a functioning end-to-end early warning system (EWS). (3) Training sessions on emergency response and skills for BDCCs and volunteers (4) Setting up alternative livelihood options for poorer members of the community.

4) Infrastructure that reduce risk

The developed community based risk management plan indicates classification of homes and other buildings by flood risk level (low-, medium- and high) based on the structure and material of the building and the locations of the community's critical infrastructure if present, and plans to develop them if absent. These included health centers, day care centers, schools, the *barangay*'s Emergency Operations Center (EOC), evacuation routes, the temporary and the permanent evacuation centers, and the means to communicate the alerts of possible floods.

Through the PROMISE, four structural improvement projects were the identified, which came out at action planning workshops. Implemented activities are rehabilitation and improvements to three barangay evacuation centers and a construction of a dyke for flood prevention. The money from the project was used to buy construction materials. The residents of each *barangay* contributed their labor for free, and the work was done under the supervision of the city engineer.

5) Safety of all schools and health facilities

The DRR TWG of Dagupan City coordinated its efforts with the regional office of the Department of Education, Culture and Sports (DECS), to promote a culture of safety and disaster preparedness in the schools in the city and province. As a result, over 55,000 students in public and private schools participated in evacuation and earthquake drills co-organized by the city and DECS.

Furthermore, DECS was encouraged by Dagupan's efforts at DRR and worked together for a one-day DRR workshop for the Dagupan City Division of the Department of Education (DepEd). Principals, teachers, and disaster point persons from primary and secondary public and private schools participated in the event. DRR manuals and videos (Tales of Disasters) were distributed to the participants. The workshop resulted in a directive from prompted Division Superintendent Ruby Torio for all public schools under her division to form a district-wide DRR organization for DECS, and to conduct risk assessment and develop a hazard map per school.

6) Realistic, risk-compliant building regulations and land use planning principles – safe and for low-income

7) Education Programmes and Training

After an initial orientation of the selected communities, the first activity was a training and workshop on the concepts of CBDRM and participatory risk assessments. Under this, city officials who were to be closely involved in the project were trained as participants, and again as trainers. The city officials trained, in turn, the identified peer trainers from each of the barangays, and also under went in the same two-stage process. Finally, the peer trainers conducted the CBDRM training and workshop for their communities, technical resource persons coming from the trained city officials as well as representatives of the national flood control station and national weather service. These officer/ trainers are now serving not only the city but as master trainers for the region.

Once the flood emergency response plan was set up, testing and improving the plan and its features was conducted through flood monitoring, drills and simulation exercises. This continues with periodic review of the data in the participatory risk maps The BDCCs and volunteers were given several training sessions on their roles in emergency response, in first aid, SAR, and in water-based SAR. These training sessions were conducted with the technical assistance of the Philippine Red Cross chapter in Pangasinan province and the city health officer. Each barangay conducted flood drills, and each participated in the city's test of their communication equipment and information relay protocols. One barangay (Mangin) participated in Dagupan city's flood simulation exercise conducted in May 2007. All these were monitored and timed so that each BDCC and the city's EOC could improve their effectiveness in times of floods

8) Protect Eco-systems and natural buffers

Aside from monitoring the water quality of the waterways and wetlands of the City, the Office of the City Agriculture Officer is in charge of mangrove re-vegetation. The Office annually purchases tree seedlings of the type native to the area, and organizes volunteers for tree-planting from high schools and universities, as well as civic organizations of the city. The re-vegetation activity is done during Dagupan City's Disaster Preparedness Week.

The City Agriculturist is a member of the TWG and the point person for DRR.

9) Early warming systems and emergency Management capacities

The city government and eight BDCCs developed their respective emergency response plans considering the low elevated areas that easily get inundated, number of flood gauges needed for the EWS and appropriate locations, pick up points and safe routes for evacuation, safe temporary and permanent evacuation centers, people's roles and responsibilities in an evacuation and validating and revising EWS. The EWS is a combination of (1) technical monitoring of hazards and warning where the hazards are modeled and the risk is assessed to determine when a warning should be sent out, (2) communication and dissemination of warnings and (3) development of appropriate responses from individuals and communities. The testing was conducted through simulation exercises carried out with water rescue drills, evacuations, transporting to temporary locations etc. with clear signs to show safe evacuation routes. This gave the recognition that the communities as one of the key stakeholders in the establishment and operation of EWS.

The barangays used their risk maps to update the list of residents living in the high, medium and low-risk zones, developed local or indigenous equipment for warning dissemination (such as bullhorns and bamboo instruments) with the corresponding warning sounds or messages, developed flood gauges that were color-coded to correspond to alert levels, monitored these continuously once a flood alert has been raised, and transmitted the data over radio to the city government's EOC where the flood situation and overall emergency response is being coordinated; Further, billboards are set up in various points of barangays that had the legend of the flood gauges to indicate the alert and the expected response from the communities and BDCCs developed communication protocols for communicating with the city's EOC.

The city government coordinates with the relevant government office (the PAGASA Flood Control Office) so that the city could directly receive flood alerts. The city also took the role of monitoring and recording river water levels, flood heights and durations, of relaying these to the PAGASA Flood Control Office to improve their river model, and used the same to periodically assess and update the flood hazard map for Dagupan.

Some rescue equipment was distributed to each barangay based as identified in their action plans. These equipment included boats, bamboo raft, road guides to demarcate safe routes that avoid open canals, flashlights, hard hats, raincoats, boots, ropes, megaphones, emergency lamps, bamboo warning devices (*kanungkong*), two-way radios for city-wide communication, cameras, radio transistors, heavy duty lamps, farm tractor and others. Each barangay supplemented the equipment by purchasing flashlights, two-way radios, and megaphones from their own resources.

10) Needs of Survivors are placed

Some of the livelihood activities in the high-risk barangays were vulnerable to disruption during floods and it is also a priority of the communities in their action plans. Each community had set up a process for screening and approving small-scale disaster mitigation projects, and alternative income generating activities were submitted as a mitigation project. Approved projects included rice retailing, a community pharmacy, and operating pedi-cabs where community members could rent pedi-cabs from the BDCC on a daily basis. These were small income generating projects that not only created income for the poor community members, but also provided the BDCC either with operating funds from the pedicab rental fees or with relief goods (rice and medicine) that was replaced with fresh stock before they expired (and the old stock sold through the community stores).

5. Which local institutions be engaged in the CAMPAIGN? (in addition to local govt.)

The Center for Disaster Preparedness (CDP), League of Cities, Dept. of Interior and Local Govt. Local Govt. Unit with technical guidance from ADPC

6. Which part of the city administration will be the focal point for the campaign?

The Mayor's Office / Office of the City Agriculturist

7. Achievements in all of the ten essential areas

1 – poor/ nothing in place
2 – some progress in place
3 – in place and well functioning
N/ A

	Essentials	**Rank**
	Essential N. 1	3
	Essential N. 2	3
	Essential N. 3	3
	Essential N. 4	3
	Essential N. 5	2
	Essential N. 6	1
	Essential N. 7	3
	Essential N. 8	2
	Essential N. 9	3
	Essential N. 10	3