

# Safer Cities 25

Case studies on mitigating disasters in Asia and the Pacific

## Reducing Vulnerabilities to Climate Change Impact and Strengthening Hydro-Meteorological Disaster Risk Mitigation in Secondary Cities in Asia

The “Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities in Asia (PROMISE)” is being implemented since October 2005 by the Asian Disaster Preparedness Center (ADPC) with funding support from the Office of Foreign Disaster Assistance (OFDA) of the U.S. Agency for International Development (USAID) in six (6) secondary cities in six countries i.e. Bangladesh (Chittagong), Philippines (Dagupan), Pakistan (Hyderabad), Sri Lanka (Kalutara), Vietnam (Da Nang) and Indonesia (Jakarta). The four program components of City Demonstration Projects, Regional and National Capacity Building, Advocacy for mainstreaming risk management in urban governance and Regional Networking and Information Dissemination focus on the need to reduce the vulnerabilities to climate change and to minimize the destructive impacts of the hydro-meteorological hazards on vulnerable urban communities and economic infrastructure through enhanced preparedness and mitigation.

### PROMISE Working Group Meeting 2008

Over the period of 3 years (2005-08) of PROMISE program implementation, lead partners have gathered immense experience towards addressing urban disaster vulnerability reduction in terms of physical, social, economic and environmental dimensions. The partners have adopted their own strategies in mapping hazards, assessing the vulnerabilities and risks at all three (3) tiers i.e. city, community and household. This enabled planning and implementing city level hydro-meteorological risk management practices which are harmonized with different cultures and indigenous practices, an easier task. This sets the background to proceed for impact assessment of the process adopted in these secondary cities. Success stories and lessons learnt in implementation of the PROMISE can be shared with other country partners and networking institutions.

The Working Group Meeting (WGM) of PROMISE was organized with the objectives of:

- ⊗ Sharing the experiences of the program partner countries in hydro-meteorological risk management in the urban context and community level discussing the strategy for possible replication of the good practices and assessment tools to other urban communities;
- ⊗ Facilitating better urban risk reduction and disaster mitigation through disseminating the knowledge and experience under this program;
- ⊗ Promoting better understanding of the National Strategy for Natural Disaster Prevention Response and Mitigation of the host country Vietnam and recent initiative by the National Disaster Mitigation Partnership (NDM-P) of Vietnam
- ⊗ Advocating mainstreaming Disaster Risk Management (DRM) in the local contexts



### Abstract

Secondary cities in developing countries are becoming the hub of livelihood opportunities which attracts rapid economic growth, high population density and thereby high disaster risks. Urban centers, industries, informal small scale businesses and urban population settlements are blooming in ad hoc manner without following proper land-use planning. Due to economic, social and political pressures the urban poor are forced to live in hazard prone areas rendering them more vulnerable to disasters. The analysis of natural hazards in South and Southeast Asia indicates that geologically triggered hazard events such as earthquakes and tsunami are responsible for higher consequences in terms of damages losses, but are comparatively low frequency. Hydro-meteorological events are more frequent and more widespread within South and South East Asia.

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## Theme 1: Experience in Urban Disaster Risk Management: Vietnam

### *National Strategy for Natural Disaster Prevention, Response and Mitigation for 2020: Vietnam*

In Vietnam, the Ministry of Agriculture and Rural Development, the Central Committee for Flood and Storm Control and Natural Disaster Mitigation Partnership (NDM-P) have a major role to play in managing and responding natural disasters. After years of work on the Law on Organizations of Government (2001), Law on Water Resources (1998), Law on Dykes (2006), Ordinance on Flood and Storm Control (1993, 2000) and Decree 86/ 2003/ ND –IP (2003), the Government of Vietnam approved “The National Strategy for Natural Disaster Prevention, Response and Mitigation for 2020” (hereinafter referred to as “the strategy”) in November 2007. The General Goal of the strategy is to “mobilize all resources to effectively implement disaster prevention, response and mitigation in order to minimize the losses of human life and properties, the damage of natural resources and cultural heritages, and the degradation of environment, contributing significantly to ensure the country’s sustainable development”. The broad spectrum of the strategy covers forecasting and sectoral planning with integration of DRR, capacity building, resettlement, search and rescue measures, structural and non-structural measures including infrastructure, irrigation, storm shelters, fisheries and communication. The strategy clearly defines the roles and responsibility of every government agency and mandates to carry out the tasks within given time frame. Therefore, each ministry and department is now taking actions to formulate programs to implement their assigned tasks.

### *Situation of Natural Disaster Forecast in Vietnam*

Vietnam, with its eastern coast in the Pacific Ocean and more flat land spanning over a few kilometers interior, suffers annually with disastrous typhoons and floods. Unplanned and rapid logging of the forest cover in the central parts of Vietnam had caused severe imbalance in the usual seasonal monsoon pattern. The average temperature in central Vietnam has increased 1 – 3°C during the last 10 years, which in turn equally increases the severity of cyclones by three times. Meteorology Department observed 30% increase of rainfall during the study period of ten years.

The Meteorological Department of Vietnam is preparing a Master Plan. The Department recently purchased a set of automatic hydro-meteorological equipment for reading data, analysis, and forecasting and currently training its staff in using these modern high technologies in forecasting and early warning. A land survey is under preparatory stage. The system is still in the preliminary phase of implementation and a large quantum of work is remaining to be completed.

### *Disaster Mitigation and Response: Post Xangsane Typhoon Experience*

The Xangsane typhoon in 2006 affected 1.3 million people and caused a loss of 330 million US Dollars. 14,138 houses were completely destroyed, 42,691 were partially damaged and 65,281 houses were unroofed and slightly damaged adding heavy losses in agriculture and property in the urban district of Cẩm Lệ.

*This theme was devoted to share the host country, Vietnam’s experience in Urban Disaster Risk Management (UDRM) in particular, hydro-meteorological disaster risk management. The following experiences were highlighted and elaborated through the presentations by the Vietnamese partners:*

- National DRM Strategy and linkages with DRR in Urban development*
- Da Nang city Master Plan development and land use planning approaches for safer communities*
- Urban risk management project experience in Vietnam (NDM-P, PEMSEA, CECI, Development workshop etc)*

It was obvious during Xangsane that Cẩm Lệ was not prepared for such events and reminded them the importance to be more prepared for future disasters.

In Post Xangsane scenario, PROMISE was a timely intervention for Da Nang city in Cẩm Lệ district to recover quickly. During the implementation of PROMISE, the Peoples Committee, community, and other governmental organizations such as Provincial Committees of Flood and Storm Control have shown positive attitudes, good cooperation and direct involvement. PROMISE focused on improving the DRM planning capacity of the communities by raising awareness on disasters and promoting disaster reduction measures such as Community Based Disaster Risk Management (CBDRM). Though dealing with floods and typhoons are not new to Da Nang, the approach of community-centered planning and emphasis on participation were new which helped the city in speedy recovery. The fact that the communities fully cooperated in program implementation such as volunteering to donate a stretch of their land to use for evacuation routes and constructing dykes, showed their sense of ownership was increased through this newly introduced community-centered approach. They were introduced to share

their views in implementing the program, face emergency situations, accept CBDRM as a new approach of teaching the adults and now they are ready for periodic mock exercises to face any emergency situations.



**Hazard Zone Map of Vietnam**

Source: NDM-P, Vietnam



Emergency Response Training by ADPC

Xangsane proved that unsafe building construction practices were one of the main causes for heavy losses. PROMISE program facilitated training and capacity building of the community members on safe building construction techniques and emergency search and rescue. An Emergency Operation Center (EOC) was established with emergency search and rescue tools, equipment and communication facilities. Periodic mock exercises on emergency evacuation mechanism were conducted to make the communities understand it thoroughly. With the training, local skilled craftsmen and building construction personnel were able to apply the knowledge and skills in disaster resistant building techniques during Xangsane recovery. They successfully integrated the “Ten Principles” of safe building into new constructions practices. Further, recognizing the importance of partnership, they were actively involved in the upgrading of irrigation systems and Lime Lac sluice and evacuation routes. These training and skills helped Da Nang people to be fully-gearred with all techniques to face future disasters with minimum losses.

*Proactive approach to integrate development and DRR plans: Central Vietnam*

Central Vietnam is full of hills, valleys and terrains and rich with natural water bodies. Being predominantly an agricultural country, this unique terrain was used to build dams, reservoirs and irrigation structures. Because of this unique geographical

positioning and hydraulic structures, the area is habitually vulnerable to floods and landslides. In order to mitigate the disaster risks in Central parts of Vietnam, the Central government has developed a Master Plan for urban/rural planning in hazardous living areas with special focus on structural improvements in high risk areas and resettlement of people. The project includes structural analysis using Geographic Information System (GIS) and databases, measures to be taken to address risk, allocation of capital, mechanism for implementation and monitoring and evaluation of project impacts. This approach will benefit 30% of the 5 million total populations living in Central Vietnam.



Da Nang, Vietnam

One of the best solutions for flood and landslide risk is the integration of structural and non-structural mitigation projects into development plans. Currently, with funds from the Central Government, a comprehensive analytical study is being carried out on relocation and resettlement, land-use planning and mitigation of flood risks. The study after being finalized will be converted to a project proposal.



## Theme 2: Planning and Implementation Process for Urban DRR

*“If we fail to plan, we plan to fail.” Records of recent disasters in cities of Asian countries show increased vulnerability of urban built up areas resulting in loss of lives, properties, infrastructure and livelihood. For short term or long-term measures, proper planning is mandatory from the inception. Identification of risks, Hazard and vulnerability assessment, data collection and analysis, needs assessment, capacity building, surveys, assessments on available resources and measures, building control regulation codes and land use planning, level of community awareness, are some of the initial actions engaged at the base for planning stage for DRR.*

*Demonstrating DRR planning and implementation: Dagupan City, Philippines*

PROMISE-Philippines established that effective community participation was the key to their success. The program along with its partners implemented eight small-scale community early warning mechanisms and made evacuation plans for each of those communities. These evacuation plans were incorporated in drafting one city-wide Early Warning System and Evacuation Plan. PROMISE was successful in making eight (8) community-wide and one (1) city-wide Emergency Response and Mitigation Plans. Networking among private-public partners greatly assisted in the successful implementation of the plans developed at community and City levels. Close consultation with Asian Disaster Preparedness Center (ADPC) and other technical partners significantly contributed in Dagupan’s success. Dagupan City Government, the Technical Working Group, Center for Disaster Preparedness (CDP) and Barangay leaders were invited in several local, national, regional and international information sharing conferences such as Regional Climate Change workshop, UN Education Workshop, to present their success story.

The promotion of PROMISE DRR experiences in every possible instance had opened opportunities for sustainability and replication of those DRR activities in other barangays of the City.

*Setting up Milestone on CBDRM: Hyderabad, Pakistan*



DMC consultative process

PROMISE-Pakistan focused on Community Based Disaster Risk Management (CBDRM) as the suitable approach for planning and implementing DRR process in selected communities in the District of Hyderabad, to train and build capacities of the first responders and members of Search and Rescue (SAR) teams. Their skills were proven valuable during Ghera Basti fire break out in one of the project areas.

Six Disaster Management Committees were formed and they undertook to implement five pilot projects out of six and the other project will be implemented by the Government. An Emergency Operations Center was established by the District Government of Hyderabad with strong connections to the first responders within relevant district departments. Since children are more vulnerable during disasters, District Nazim (Mayor) focused more on school safety programs as part of the implementation process for DRR. Distrust can exist in the political, economic, and social relationships between communities and government. Bridging this gap is one of the most tedious tasks development workers face. One experience of PROMISE-Pakistan was that it is easier for the government to

implement successful DRM projects if there is trust in the capacity of community leaders as well as if financial empowerment of the communities is ensured. There is a high demand for capacity building as well as institutional development in order for the communities to be resilient and prepared.

### Setting up Milestone on CBDRM: Chittagong City, Bangladesh

Under PROMISE-Bangladesh, ten most vulnerable wards in Dhaka City were identified and an inception workshop was held to describe the program objectives and activities, gather first-hand knowledge and information, and promote participation and ownership. Furthermore, the program went on to sensitize the local elected commissioners of the wards to get more community participation through them. About 200 change agents were identified and 10 ward Disaster Risk Management Committees were established. The change agents were trained on disaster management subjects such as Disaster Risk Hazard, Disaster Management in Urban Areas, Risk Reduction, VCA Tools, Community Risk Reduction Action Plan and Urban Hazards. Workshops were conducted in all targeted wards to create awareness among communities on hazards, vulnerabilities and risks. After the workshop, Community Risk maps were produced by all 10 wards. Based on community risk maps 5 small-scale mitigation projects were identified on priority basis. Overall, the communities were involved in the identification,



Capacity Development of Change Agents

development and, design of projects as well as fund raising, location selection, implementation and maintenance of the project. Therefore, the execution of the mitigation projects was successful because of the full involvement of the communities.

### Bottom-up Approach in DRR planning

Participatory Disaster Preparedness Planning (PDPP) refers to a bottom-up planning approach based on CBDRM which encourages active community participation in assessment of disasters and risks and developing short term and long term preparedness plans to be incorporated into the development plans. Number of legal instruments in Vietnam accommodates and mandates PDPP<sup>1</sup>. By conducting PDPP Vietnam partners of PROMISE had achieved the following:

- Capacity of local government planning has been strengthened;
- Disaster risk reduction measures are integrated into local development plans;
- District DPP combined RRD measures proposed by sections and wards;
- Communities in hazard prone areas actively participated in PDPP and are more aware of their roles and responsibilities;
- Better disaster risk management to reduce disaster impacts through different disasters occurred during project lifetime.

The main strength and sustainability of PDPP is that it is in-line with the Government Strategic Plan for Disaster Risk Management to 2020 and the active community participation in planning, implementation, monitoring and evaluation of the project activities. After seeing the success in PROMISE supported CBDRM approach, local authorities are more respectful for CBDRM approach and are more aware of the effectiveness of integrating DRR into community development programs. One of the best outcomes of PROMISE-Vietnam was that the trained local trainers are capable of extending their expertise and skills in expansion of CBDRM activities into other areas of the district.

## Theme 3: Good Governance and Urban DRR



### Governance and Urban DRR- A case of Hyderabad, Pakistan

Transparency and participation of the public are crucial and mandatory factors for good governance. This is a good case study which demonstrates the effectiveness of participatory planning by elected members and communities at risk for reducing the vulnerability to future disasters as good governance practice. Hyderabad Nazim Council was able to maintain the transparency and participation by all in planning, implementation and monitoring progress in implementing Small-scale Structural Mitigation Projects in Hyderabad under the PROMISE program. These projects included street raising, earth filling and improvements to drainage system and toilets in Ali Abad Union Council 16, Maheswary Colony Union Council 14, Takur Colony, Ghera Basti Hindu Union and Latifabad

*Good Governance provides a solid foundation for DRR in a sustainable manner. Main characteristics of good governance are Strategic Vision, Responsiveness, Participation by all, Decision making, Equity, Accountability, Effectiveness and Efficiency, Transparency and Rule of Law. Implementation of DRR strengthens the governance process in identifying disaster resilience, realizing people's safety, health and sanitation, and improving livelihood. DRR intervention is significant in working with responsiveness and delivering services effectively and efficiently for the urban development. Once the community support is ensured, they will be a part of pressure groups who demands political and community leaders to secure their lives, shelters and other basic needs.*

Union Council 2 (Baban Shah). Salient features of these projects were participatory approach, ability to maintain health and sanitation needs and convincing Hyderabad district council to repair the pumping station building, install machinery and put them in working order. With these mitigation interventions, the drainage system is working properly now and pumps are discharging the flood water properly. This experience made the Nazim Council to realize the importance of community participation from the project inception with the support of the elected members in successfully

implementing DRR. Also, this is a good opportunity for people's representatives to understand public needs and make the order of priority accordingly. Planning and implementation at field level address the capacity gap in implementation of structural measures.

### Urban Community Participation and Good Governance: Philippines

The Community Small Scale Mitigation Projects (SSMPs) were identified as part of the Community Action Plans/Risk Reduction Plans. Thereafter, a series of consultations were carried out between the Barangay Disaster Coordinating Council (BDCC), Center for Disaster Preparedness (CDP), Technical Working Group (TWG) and the Community. The role of the TWG was to guide, remind and monitor the assigned communities on their Action Plans and the SSMPs. The SSMPs included making of flood-markers, alternative livelihoods, equipping BDCC and structural mitigation activities. Carrying out the responsibility of good governance, the City Mayor signed a Memorandum of Understanding with the Community Heads and the CDP to mainstream community DRR activities into the local governance. Involving the stakeholders in the entire process of disaster risk reduction efforts from risk assessment, planning, consultation and implementation, magnifies positive impact and increases capacities of the city and the community. In addition, Dagupan City Government and the communities set the example to the rest of the Asia that the continuous support of the local government by involving the high risk communities in institutionalization of disaster preparedness is far more effective than any other disaster reduction strategy.

- Installation of pond sand filter for Ward 41
- Desilting of Canal in Ward 40
- Improving toilets and providing water in School cum Temporary Shelter in Ward 37
- Improving toilets and providing water in Slum and low income dwellers in Ward 36
- Preparation of Standard Operating Procedure (SOP)



Flood markers, Dagupan, Philippines

Urban communities were given the opportunity to participate from the beginning i.e. identifying, developing, designing, fundraising and implementing the projects. A Project Implementation Committee (PIC) was established which comprised of the members of Ward Disaster Risk Management Committees (WDRMC), Community Representative, Change Agents, Local government/NGO representative and project personnel with Ward Commissioner as the Chairperson.

These projects were successful in gaining active community participation throughout the project cycle and it demonstrated the capacity of the urban communities in decision making. This high involvement of the community ensured the sustainability of the project even after the PROMISE assistance has ended. PIC along with the communities had made a plan for maintenance and thereby formed a Maintenance Committee to monitor, maintain and carry out necessary repairs of the structures built under the project as disaster mitigation. The strong sense of ownership the communities felt over these mitigation projects lead to their successful implementation.

### Mainstreaming DRR in Local Government in Sri Lanka

The DRR activities have not yet reached the mandatory level at the local government sector in Sri Lanka. Land use planning, building regulations and codes and environment regulations are not yet absorbed into the practicing and implementing at the local government level. PROMISE has attempted to advocate for delegation of DRR functions to local authorities to make them work effectively in local risk reduction measures. With the guidance of PROMISE program, National Building Research Organization (NBRO) identified interested groups of local authorities and had several meetings with them to identify the gaps, possible solutions and strategies. These discussions were documented and were presented at a workshop at National level. The study addressed the issues and recommended policy development and strategies for land use planning, infrastructure development, training and strengthening of local government sector.



Community level risk assessment and planning, Chittagong, Bangladesh

### Case study on community Awareness Raising- Vietnam

In Da Nang, traditionally the disaster preparedness plans were developed annually by the Committee for Flood and Storm Control (CFSC) which had lesser-weighted focus on disaster preparedness. Communities implemented those plans which were developed by external institutes and agencies and thus, they lacked the sense of ownership over the plans. PROMISE-Vietnam promoted the Community-based Disaster Risk Management (CBDRM) in which the community themselves developed the Community Disaster Preparedness Plans using participatory planning techniques and risk assessment tools. Thus, the sense of ownership over the plans increased among the communities and they became active partners in implementing the plans. Similarly, capacity building and raising awareness on disaster resistant building construction were also carried out for local builders, masons and technical staff. Communities became more aware of the benefits of disaster resistant buildings and graciously incorporated those in reconstruction and rehabilitation after Xangsane typhoon. The key lesson learnt was the realization of the importance and benefits of CBDRM in implementing DRR activities by the Vietnamese authorities as well as the communities.



Community Mapping, Da Nang Vietnam

### Community level efforts in reducing the risk- Chittagong, Bangladesh

The mistrust between the government and the communities has been one major barrier in effectively implementing any risk management activities. First and foremost, peoples' ownership in the projects should be entrusted for a successful and sustainable project implementation. PROMISE-Bangladesh initiated five small-scale mitigation projects in selected communities as demonstration projects. These included:

implementing DRR activities by the Vietnamese authorities as well as the communities.



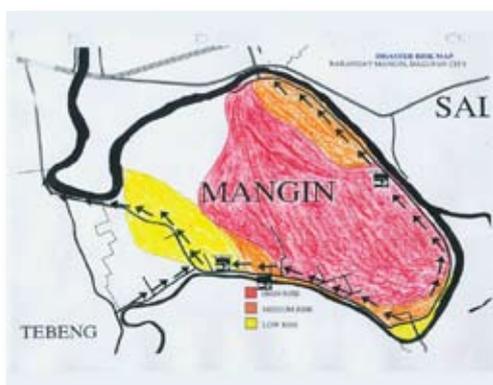
## Theme 4: Technology Development and Transfer for Urban DRR

*Technology development and transfer emphasizes on developing cost effective technologies and mechanism to transfer them to the community in order to increase their disaster resilience. The mechanism should also consider and identify distinct roles in all stakeholders for urban disaster risk reduction process. Technology development includes the devising of Early Warning System (EWS), cost effective retrofitting techniques to increase disaster resilience of existing buildings and identification of possible integration of traditional mechanisms into modern high technologies.*

### *Stepping Stone towards Climate Change Adaptation:*

#### *Dagupan City, Philippines*

Barangay Mangin in Dagupan, Philippines with its strong-willed and determined leaders and community members collaborated with the Dagupan City Government and PROMISE program in reducing the disaster risks they have been suffering from since time immemorial. There was neither an early warning system in place nor any systematic preparedness mechanism to reduce the disaster risks. The PROMISE program came to Dagupan with strong insistence on CBDRM objective. Therefore, the project identified the community's needs first and accordingly developed a series of training and workshop to create awareness and capacity building on early warning, evacuation, basic life support and first aid in community. With these skills and capacities, the community developed a Flood Risk Map with details of the evacuation route for their community. Dagupan City, with the support from the PROMISE program, conducted a Flood Response Simulation Exercise. Flood gauges were installed and the community was trained to read and understand the water level and appropriate actions to be taken. The lesson which Barangay Mangin taught the PROMISE program as well as other communities was that the community's indigenous knowledge and mechanisms can be used with new technologies even today. Dagupan City and Barangay Mangin have won the prestigious Kalasag Award (the Disaster Risk Management Award) for Region 1 as Best Performing CDCC and Best Performing BDCC for rural category for cities and barangays, respectively.



Disaster Risk Map of Barangay Mangin

### *Technology and its application in Emergency Planning:*

#### *Dagupan City, Philippines*

Dagupan City added a concrete example to the theory that active community participation in implementing DRR practices foster higher degree of success, during typhoon Cosme in 2008. Under the PROMISE initiatives, Dagupan City Disaster Coordination Committee (CDCC) through the Technical Working Group (TWG) improved the Emergency Response Plans for the city. During typhoon Cosme, the CDCC together with the Barangay Disaster Coordination Committee (BDCC) were able to test the Disaster Risk Reduction Plans, which included the early warning and evacuation plans of the City as well as the communities. Early warning and evacuation plans were successfully used in eight high risk communities in Dagupan. Unlike before, a close coordination between the city and communities and other service providers such as the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA), was seen during the Cosme disaster. The communities were proactive in responding such as the early evacuation of their affected families to stable houses in the community without the assistance of the City Government, which was not the same case prior to PROMISE intervention. This proactive participation from the community enabled the City to carry out other urgent services for the whole city. Thus, there were no casualties in the high risk barangays or PROMISE pilot areas. Communities actively responded with early warning, evacuation, assessing damages and needs and in relief operations and post cyclone clearing. The city responded by immediately declaring a state of emergency and conducting other post disaster activities. This close coordination between the urban communities and the City Government helped in faster recovery after typhoon Cosme.

### *Silver line in the Dark Clouds: Da Nang City, Vietnam*

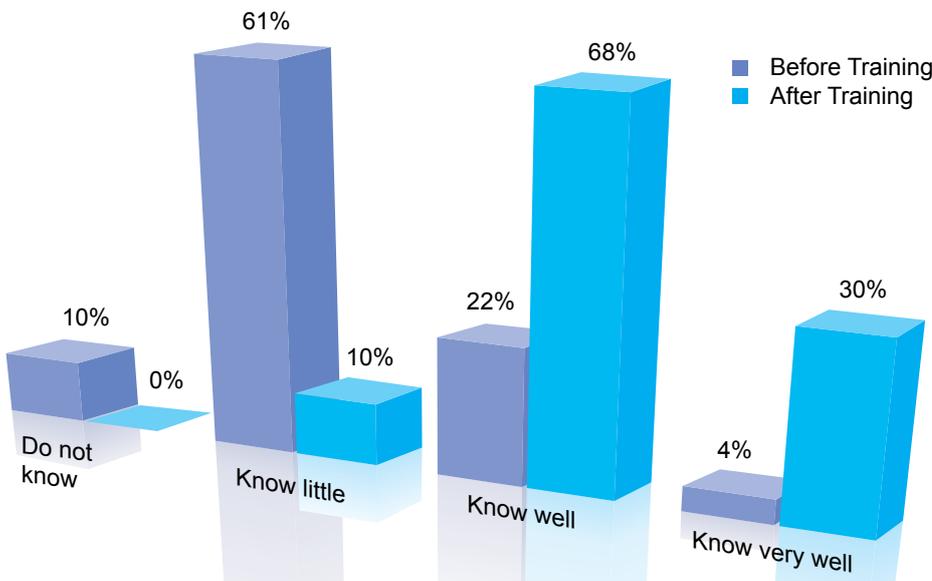
The silver line in any disaster is that it provides an opportunity to raise awareness on how to reduce risks. Thereafter, the reconstruction phase contributes to capacity development on disaster resistant techniques. This was the experience in Cẩm Lệ urban district after Xangsane typhoon in 2006. Recovery planning and implementation was not part of original project concept. The project did not have necessary funds to help recovery activities. Realizing the need CECI,



Mangin Indigenous EWS



Close coordination during preparation for Cosme



Source: "A case study of Hoa Tho Dong Ward, Cam Le district, Da Nang city", Mr. Truong Van Vy

project implementing partners raised funds to help the affected communities in re-building their houses.

Causing heavy losses and damages to life and property, Xangsane opened the eyes of Da Nang to focus on disaster preparedness. PROMISE provided technical support to Da Nang in introducing disaster resistant building techniques. A Training of Trainers (TOT) was conducted on building techniques which are resistant to typhoon and flood to ward and district engineers who thereafter conducted training to beneficiaries and local builders. Community members both men and women were consulted on the design and materials to be used in house construction while giving special attention to local culture, tradition and community preferences. Reconstruction phase was highly useful in raising awareness and capacity building which is clearly shown in the graph below on community awareness level. It was mandatory that all the beneficiaries should attend training and awareness programs on disaster resilient housing construction techniques. Information dissemination tool kits were also used to create awareness. A poster with construction guidelines for house builders, construction companies and ward engineers was developed

and displayed in communities where houses were built. This poster will be used in continuing awareness creation among the communities throughout Cẩm Lệ district in the future.

*People Centered Early Warning System: Responding Climate Change impact in Sri Lanka*

Kalu River discharges approximately 4,032 x 106 m<sup>3</sup> of water to the Indian Ocean annually. The villages and cities along the river banks are frequently flooded with heavy rainfall. Setting up a people-centered early warning from upstream to downstream was identified as the best technological intervention to address flood preparedness and thus, mitigate the high risk and vulnerability. The National Building Research Organization (NBRO) of Sri Lanka together with the University of Peradeniya, under the PROMISE program, initially collected data on topography, rainfall, discharges, historic floods and developed a flood model and

identified ten (10) sites to install flood gauges. Though modern high technology was used in developing the flood model, it was customized to suit to the community level understanding. Through this flood model and by reading the levels of existing flood gauges at river upstream, probability of flood level at downstream can be predicted. Thereafter, Lanka Jathika Sarvodaya Shramadana Sangamaya (Sarvodaya) trained the neighboring communities to read and understand warning, alert and evacuation levels. Community Based Disaster Management (CBDM) groups were formed within each community to maintain the installed gauges and issue early warning based on gauge readings. The model and the early warning system were tested during 2008 June floods which showed the following issues:

1. Eight out of ten gauges were submerged due to simultaneous heavy rainfall in both the major catchments and sudden opening of flood gates of major hydropower stations located upstream.
2. Some people were evacuated due to installed early warning system even before reaching the evacuation level.
3. People centered EWS has developed interest among the community to know precise time (Lead time) that, when floods will reach to their areas. However, the present model could not cater that requirement of the community and thus, requires further improvement.

After the program completion, NBRO will handover the flood model and maintenance of flood gauges to the Disaster Management Center (DMC) of Sri Lanka. The DMC together with Sarvodaya and the communities will continue to maintain and update the early warning system and the flood model to increase the reliability in early warning.



Training class on disaster resistant building techniques, Da Nang, Vietnam



Villager measuring flood gauges along Kalu River, Sri Lanka



## Theme 5: Practices for Mainstreaming DRR in Urban Development

*Mainstreaming refers to broadly bringing ideas, concepts, approaches/practices, policies and programs into the prevailing policies. It also draws the attention of society and institutions to understand the importance and earnest need to advocate for mainstreaming DRR in to policies. The dawn of the new millennium brought forward the realization that disasters and development are interrelated. Disasters set back the development process and recovery opens up new avenues of development. This co-relationship emphasizes the strong influence of disaster risk reduction measures into the development practice. The common idea of mainstreaming is to incorporate disaster risk reduction activities in ongoing development programs/projects. The end objective of mainstreaming disaster risk reduction is to assist the community, actors of development, governments and institutions in adapting approaches and formulating policy framework so that the risk emanating factors can be addressed in an effective manner.*

### *Integrating DRR in Local Governance: Dagupan City, Philippines*

Dagupan City's success in mainstreaming DRR in urban development is widely recognized as "a good practice" by the Philippines government, national and international organizations such as Oxfam and World Bank. PROMISE-Philippines program facilitated in establishing a Technical Working Group (TWG) consisting professionals from different sectors, to work on disaster mitigation and risk reduction. TWG plays an important role in the success of implementing disaster reduction measures in Dagupan City. Center for Disaster Preparedness (CDP) with PROMISE guidance, assisted in building TWG's capacity on disaster risk reduction, which the TWG used in training the high risk communities in disaster preparedness. With the assistance of the TWG, communities compiled their Action plan for DRR including the Early Warning System (EWS) and Evacuation Plan. These community action plans were the basis for the Operation Manual (Emergency Response Plan) of Dagupan



Receiving Gawad Kalasag 2007 Award, Dagupan City

City. As part of mainstreaming DRR into local governance, the city government passed the "City Ordinance No. 1980 of 2007" establishing the Emergency Operations Center of Dagupan city and provided the necessary funds for it to operate 24 hours 7 days a week. Further, to create more awareness on disaster preparedness and mitigation, Dagupan city government passed the Resolution No 5469 of 2006 declaring July 16 of every year as Dagupan City Disaster Preparedness Day and the month of July as the Disaster Consciousness Month. Schools have the Academic Olympics with disaster preparedness as their theme during July. Recognizing that DRR efforts should be integrated, coordinated and complemented among neighborhoods in order to achieve collective sustainable DRR, Mayors and representatives from neighboring cities and municipalities signed a Covenant of Partnership to help each other in disaster preparedness activities. Thus, the main reason for Dagupan's success in mainstreaming DRR in urban development and local governance is the strong political will to achieve DRR by making the communities the most important stakeholder in decision making and planning process.

### *DRR budgeting into Development Plans: Hyderabad, Pakistan*

PROMISE-Pakistan focused on sensitization and capacity building of the local government agencies in order to achieve the objective of mainstreaming DRR into urban development. This led to the reactivation of the Disaster Risk Management Committee in the District of Hyderabad and formation of DRR focus groups among elected members of the District Council. One major achievement of the program was that, through this sensitization and capacity building activities, PROMISE was able to push for a special budget allocation for DRR to be integrated in the upcoming Annual Development Plan of the District. This was possible under the effective leadership of Ms. Rana Ansar, an elected councilor of the district council. From the initial stage, she coordinated with other members and advocated for DRR budgeting. PROMISE provided the platforms for the council members to be exposed to sharing experiences of other country



Solid waste management brings additional income to the community in Bindunu-ela, Sri Lanka

initiatives which would provide possible mechanisms to achieve effective DRR through leadership.

#### *Community mobilization in Implementing Mitigation Action: Sri Lanka*

Bindunu-ela Canal Improvement and Home Composting Scheme was introduced by PROMISE-Sri Lanka as a solution to a lower middle class community's misery from solid waste and canal overflowing. The community members were educated and trained not to dump garbage into the canal to keep it clean and to produce home compost of biodegradable waste. PROMISE-Sri Lanka funded the construction of a waste collection and separation center at the nearby temple and one member in the community collects the separated waste from the households twice a week. Once the collection bins at this center fills up to a marked level, Sarvodaya had arranged a waste collecting agent to purchase the waste. The income from this selling of waste will be used to pay an honorarium for the persons working on waste collection days. In addition to having a clean canal, Bindunu-ela community enjoys fresh vegetables grown through organic home composting and additional income to the community from selling plastics, glass and paper materials.

#### *Working with Future Agents of DRR: Bangladesh*

The concept of achieving DRR through school safety programs is based on the Hyogo Framework of Action which urges the "use of knowledge, innovation and education to build a culture of safety and resilience at all levels". It is widely accepted today that the children play an important role in disaster mitigation activities rather than being mere vulnerable victims of disasters. With this objective, Bangladesh Disaster Preparedness Center (BDPC) implemented a school safety program under the PROMISE program. They have identified 10 schools to implement the project and started sensitizing the school authorities and the Education Officers of Chittagong City Corporation (CCC). Over 13,000 students were introduced to the concepts of DRR and DRR. An awareness session was incorporated into the school curriculum. Furthermore, 10 School Disaster Management Committees comprised of teachers, students, parents and school managements

were formed. School Disaster Management Plans were developed clearly stating the roles and responsibilities of everyone in the school at different phases of disaster and included an emergency evacuation map. The main strength of the program was that BDPC received good support and cooperation from the school authorities, students, parents and teachers. One of the major achievements was the establishment of School Safety Fund in one school by collecting funds from everyone in the school including students every month. This fund will be used in promoting school safety programs and disaster preparedness activities such as simulation exercises and drills. The school authorities have expressed their willingness to continue this process started by PROMISE. Next step for this program is to bring all CCC schools under this School Safety Program.

#### *Micro-Credit helps Sustaining Tomorrow: Sri Lanka*

Disasters affect the rich and the poor differently. The difference is that the recovery rate for the rich is faster because their better economic situation prior to the disaster, which enables them to return to pre-disaster stage faster than the poor who had lost his/her entire livelihood. In order to address this issue, Sarvodaya established a trust fund called "Micro Credit Scheme for DRR". Under this scheme, financial assistance was provided by SEEDS, the banking facility of Sarvodaya, to vulnerable communities to sustain their livelihoods that were disrupted by disasters and PROMISE partnered in providing technical inputs. As a pilot project, ten (10) eligible recipients were selected through predetermined criteria and granted loan facilities to commence or continue or improve selected livelihood activity. PROMISE program through Sarvodaya provided micro-entrepreneurship development opportunities for the beneficiaries with relevant trainings and specifically trained the recipients to develop Business Plans. The women entrepreneurs were linked with Sarvodaya Women's Movement to obtain more technical support. The demand for such micro-credit schemes was higher than expected and will be addressed using the revolving funds. Most of the recipients were women given the fact that they can easily operate livelihood activities at home and it was noted that generally women are less likely to default on loans.



*Conducting School Safety Program in Chittagong, Bangladesh*



*A beneficiary of the micro-credit scheme in Sri Lanka*



## Theme 6: Networking and Partnership Development for Urban DRR

*A large part of the success of PROMISE will be measured by the ability to replicate the outcomes of the demonstration projects in other vulnerable cities and areas within the target countries as well as in the region. The focus is on strengthening and institutionalizing networks and partnerships built during the implementation of program activities at the regional and national levels. Information and Network component of PROMISE aims to build public and private networks as a forum for exchanging information and experience on urban disaster management, with the goal of replicating successful urban disaster mitigation and preparedness practices from the demonstration projects throughout the region.*

### *Working Together: An inclusive approach for Urban DRM in Dagupan City, Philippines*

In order to increase the efficiency in facilitating and promoting further Disaster Risk Management (DRM) in Dagupan, the city government established partnerships with other organizations. They are clustered into two groups, i.e., Volunteer Group and Organizational Partners which includes Institutional Organizations such as national and local educational and health institutes and NGOs. The City Government's desire to encourage active participation among the community members resulted into a "Memorandum of Understanding" signed with the NGOs in Dagupan. The role of media as an effective early warning mechanism and information dissemination was recognized during this process. It was clearly shown that it is important to establish private-public partnerships to achieve DRR effectively and that the unity among all the stakeholders is the main strength of vulnerable communities and their shield against disasters.



Signing MOUs with other stakeholders, Dagupan, Philippines

### *Corporate Social Responsibility in disaster risk mitigation: Pakistan*

Different sectors and actors play key roles in achieving disaster resilience in communities. Private sectors as well as the media play an equally important role with the Government and the community in implementing DRR activities. Therefore, it is important to have partnerships and collaborations among those sectors and actors. Media is crucial in disseminating information and early warnings in disasters. Therefore, PROMISE-Pakistan program strengthened the contacts with local media centers to monitor news on multiple natural and human-made hazards. Corporate Social Responsibility (CSR) was promoted to involve the private sector in strengthening DRR. For example, one local business community donated Pakistan Rupees 2.5 million for improving drinking water supply, sewerage and street pavements of a small urban settlement. With the experience that effective partnerships and unity are important factors in successfully addressing disaster preparedness and mitigation, linkages were strengthened with Flood Control Commission and Sindh Irrigation and Drainage Authority. Community-based Disaster

Risk Management Committees (DRMCs) were established to promote volunteerism and to build up unity among the community to achieve disaster resilience. These DRMCs are encouraged to seek for private-public partnerships to become independent after the PROMISE program.

### *"Where there is a will, there is a way": Sri Lanka*

The success of any change intervention in a society depends on the "need for change" by the community and their willingness to change. The driving force in such community change is its strong committed leadership with foresight. Kalutara City in Sri Lanka is one such local government with strong leadership and commitment to achieve sustainable development while making their community disaster resilient. The Mayor's office took initiatives to have regular meetings with Local Authority representatives, technical persons, NGOs, communities and interested groups to develop contingency plans for Kalutara Urban Council. PROMISE assisted these initiatives of the Mayor's office by facilitating training capacity building, providing technical inputs in identified development projects and assisting in gaining more community participation. PROMISE-Sri Lanka trained the community in disaster resilient construction techniques, planning, Community Based Disaster Risk Reduction (CBDRR) and Search and Rescue (SAR). Through these trainings, the City developed an Emergency response plan for Kalutara. The community-centered focus by PROMISE helped the Mayor's office to change the community perspective to build trust over Government initiatives. Kalutara Urban Council commenced networking with other stakeholders, national and international partners in achieving DRR objectives with PROMISE support and guidance. The PROMISE program offered support to the City to invite other cities involved in the program to visit Kalutara and share their experiences. One major achievement they gained through this networking and partnering was the merging of the Kalutara District Disaster Management Plan with the National Disaster Management Plan. Kalutara Urban Council sets a clear example of how political will and foresight can help to make the community more disaster resilient.



PROMISE Partner Countries visiting Kalutara, Sri Lanka

### DRM and Citizen's Committee: Addressing Urban Risks at Local Level in Chittagong, Bangladesh

Given the high population density and the high number of disasters that occur every year, Bangladesh needs massive awareness campaigns, presence of Disaster Risk Management Committees (DRMC) at the ward level and efficient dissemination of DRR information on time. Thus, PROMISE-Bangladesh established 10 formal Disaster Risk Management Committees (DRMCs) in 10 wards and 10 informal Volunteer/Changed Agents (CA) groups. DRMCs include the Ward Commissioner as the chairperson and other members are comprised of school teachers, NGO representatives, political leaders, religious leaders, local elite and common people. This networking and partnering lead to the formalization and recognition of the community level DRMCs by higher authorities such as Chittagong City Corporation Disaster Management Committees.



Sensitization of Ward Commissioners in Chittagong, Bangladesh

#### Lesson Learned



- Community level capacity building, awareness creation, effective information dissemination and advocacy are effective tools in reducing the vulnerability to climate change impacts and strengthening DRM process at local level. More decentralization is needed to convince them. Therefore, community level Disaster Risk Management institutions are very important.
- Traditional technologies in different cultures are still useful in designing EWS and at the same time higher efficiency in EWS can be achieved when community members are trained in reading early warning signs and disseminating those information among their communities
- Safer housing construction practices mitigates disaster risks and reduces impacts
- Community Small Scale Mitigation Projects are ideal for achieving higher disaster resilience through Community Action Plan/Risk Reduction Plan implementation
- Networking and partnership among different stakeholders such as government agencies and institutions, different city authorities, NGOs and private sector is critical in implementing successful disaster risk reduction and mitigation activities.
- Strong political will and leadership guarantees higher success in achieving urban disaster risk reduction by integrating DRR and development activities. Continuous advocacy both at the national and local government level is needed to sensitize the decision makers.
- Children are good advocates/messengers of disaster risk reduction activities and therefore disaster awareness among children should be raised in order to minimize their vulnerability level
- Livelihood empowerment schemes can be used both as means of poverty reduction and disaster vulnerability and risk reduction
- Government needs to trust the capacity of the communities and the communities must trust the Government's good intentions in order to have better cooperation in implementing DRR programs
- Memorandum of Understanding signed between the community and the City Government enhances the trust between the two parties which results in smooth and easy coordination in achieving development and DRR goals.

#### Sustainability of Program Activities



How to continue the good practices employed in PROMISE program in order to make them sustainable were discussed at the end of the workshop. Following has been emerged through the suggestions by the participants;

- Setting up a network among the six city members and make them "sister cities" and promoters of the concept of climate resilient cities.
- Development of an effective system to share the information/knowledge and experience of PROMISE for wider dissemination of good practices.
- Concentrate more on developing indicators and presenting achievements of the pilot initiatives through indicators to capture the long term impacts
- Increase the outreach of the Program achievements through presentation of success stories to Members of Parliament and larger municipalities in respective countries
- While emphasizing on CBDRM also to work with other stakeholders such as Government agencies, NGOs, CBOs, Private sector to reduce the vulnerability to climate change impacts and strengthening DRM practices at local level
- Promote the importance of good governance and political will to achieve success in DRM as emphasized through the practice of budget allocation for capital investment for DRM activities by Dagupan city government
- Continue community awareness raising activities on the benefits of disaster preparedness for developing climate resilient communities
- Look for proactive and effective ways of mobilization of resources needed for carrying out mitigation and preparedness activities as well as recovery and rehabilitation at local level through the support and partnership of all stakeholders including government, private sector, NGOs, CBOs etc
- Advocate for inclusion of disaster mitigation and preparedness activities to be included in school curriculum in the respective target countries
- Expanding PROMISE in to other urban areas prone to Hydro-meteorological disasters without limiting to six secondary cities



## References

PROMISE Working Group Meeting Presentations by Partner country organizations

## Web sites

UNESCAP

## Endnotes

- 1 *Decision on Flood and Typhoon Preparedness and Disaster Mitigation No 63 of 2002, Decree on Democracy at Grassroots Level No 79 of 2003, Decree on Promoting Decentralization of Government Management No 8 of 2004, Ordinance No 21 on Flood and Storm Control of 2004, Decree on Revised Regulations for Flood and Typhoon Preparedness No 8 of 2006 and National Strategy for Disaster Management to 2020 of 2007*

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- Bangladesh Disaster Preparedness Center (BDPC), Bangladesh
- Bandung Institute of Technology (ITB), Indonesia
- Aga Khan Planning and Building Services (AKPBS,P), Pakistan
- Center for Disaster Preparedness (CDP), Philippines
- Lanka Jathika Sarvodaya Shramadana Sangamaya (Sarvodaya), Sri Lanka
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Safer Cities 16: *Cooperation between Local Authority and Communities Reduces Flood Disaster Risk in Dagupan City, Philippines*

Safer Cities 19: *Promoting Safer Housing Construction through CBDRM: Community-designed Safe Housing in Post-Xangsane Da Nang City, Vietnam*

Safer Cities 20: *Community Based Early Warning System and Evacuation: Planning, Development and Testing*

Safer Cities 21: *Community Empowerment and Disaster Risk Reduction in Chittagong City, Bangladesh*

Safer Cities 22: *Flood Disaster Mitigation and River Rehabilitation by Marikina City, Philippines*

Safer Cities 23: *Urban Flood Risk Mitigation in Kalutara City, Sri Lanka*



**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 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 the efforts under a specific program objective to *increase stakeholder involvement and further enhancement of strategies, tools and methodologies related to community preparedness and mitigation of hydro-meteorological disasters in urban communities.*



*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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