

SUMMARY PAPER ON BEST PRACTICES IN DISASTER MITIGATION¹

as discussed at the Regional Workshop on Best Practices in Disaster Mitigation
in Bali, Indonesia, September 24-26, 2002

Introduction

The seven-year-old Asian Urban Disaster Mitigation Program (AUDMP) has produced substantial achievements, outputs, and lessons learned. In order to share and showcase these experiences and lessons learned, the Asian Disaster Preparedness Center (ADPC) organized a Regional Workshop on Best Practices in Disaster Mitigation on September 24-26, 2002, in Bali, Indonesia. Almost 150 project participants, elected and appointed officials and representatives of governmental agencies, academia, and non-governmental organizations participated in the workshop's intense discussions which covered every major component of comprehensive risk management.

Purpose of the Summary Paper

This summary paper highlights the mitigation work being undertaken by various organizations in the AUDMP and other programs and captures the overall essence of urban disaster mitigation in Asia as presented and discussed at the Regional Workshop. While this summary cannot convey the sense of energy and passion for their work that was expressed by workshop participants, it hopes to do justice to the thoughtful processes devised by AUDMP participants and their energetic and persistent efforts against heavy odds, as well as their actual accomplishments.

Workshop Objectives

The primary reason for organizing the Regional Workshop was to showcase best practices and to share experiences and lessons learned in protecting and strengthening societies through the AUDMP and other initiatives. The workshop organizers were motivated by the desire to promote disaster mitigation through learning about mechanisms, strategies, and practices that have worked in various target cities and countries. And to promote not just transfer of ideas and knowledge, but replication of motivation and action.

The participants were inspired to take part in the workshop by their shared interest in protecting and strengthening our societies. With this shared vision of sustainable societies in mind, people are searching for effective disaster risk management practices which can be implemented and integrated into their own communities' priorities and activities.

Workshop Design and Structure

The workshop was structured around eight themes and eight theme sessions, which in combination provided a holistic approach to disaster risk management. The first and last of these sessions were plenary sessions, while the other six were presented concurrently, two by two. Each theme session had a distinguished chair and co-chair and a theme presenter who introduced the theme. Case study presentations were made by participants in the AUDMP and other initiatives, followed by a facilitated discussion period and a final summary or synthesis of the major points by the theme presenter.

¹ Prepared by Shirley Mattingly with grateful acknowledgement of the papers submitted by the theme presenters and workshop participants and the process report by the workshop facilitator.

Theme Highlights

Policy, Legal and Institutional Arrangements

Overview: Policy, legal and institutional arrangements together form the foundation for a community or society's approach to disaster mitigation. If any of the three is weak, the entire system will be prone to failure. There is a legal and governmental context for everything we do; a country's constitution and laws provide the framework for its response to societal issues and its philosophical approach to managing disaster risk.

From the perspective of policy, legal and institutional arrangements, effective disaster risk management relies on:

- a strong legal basis
- capable nodal agency
- mechanisms for inter-institutional coordination
- ongoing planning and capacity-building processes
- public policies that protect human and economic and natural resources and activities, that integrate risk management into development plans, and
- community and stakeholder participation.

The laws, institutions, and systems for managing disaster risk around the world follow certain patterns but no universal model. Studies in various countries have found a shift in philosophical approach away from a strictly "top-down" approach, relying on government alone (or the national government alone), to a combination of "top-down" and bottom-up" approaches. The idea is to tap the initiative of local community groups. Communities traditionally rally around each other when disaster strikes; we want to unleash that cooperative spirit and energy before the disaster, contributing a sense of community empowerment, especially in the current context of decentralization of authority to sub-national levels of government in many countries. Leadership and commitment are needed in both government and civil society, working together to:

- incorporate consideration of risk management into routine decision-making
- build coalitions and partnerships, and
- engage community and neighborhood groups.

Disaster Management Policy in Indonesia: Recently the Government of Indonesia has increased emphasis on disaster mitigation. BAKORNAS PBP is the national nodal agency responsible for this purpose, which is headed by the vice president. The organization has been restructured to address the concerns of disaster mitigation more effectively.

The Indonesian Urban Disaster Mitigation Project has policy components at both local and national levels. Some of the lessons learned are:

- policy has to have vision and flexibility.
- endorsement of Mayor is not enough; his leadership in mitigation and preparedness is also needed.
- a champion has to be strong and persistent in influencing decision makers.
- the lack of a permanent institution with permanent resources to deal with disaster hampers the development of better preparedness and mitigation approaches, as it deals mainly with emergency response and recovery
- without the necessary legislation on disaster management, there is no legal status for policy implementation.
- involvement of stakeholders from the beginning and over time is essential.

Municipal Disaster Management Committees in Bangladesh: The municipalities in Bangladesh are regulated by rules and standing orders issued by the central government, one of which establishes Municipality Disaster Management Committees chaired by the Chairman of the Municipality. The Bangladesh Urban Disaster Mitigation Project (BUDMP) works with the MDMCs to enhance and

promote institutional capacity for municipality disaster contingency planning, coordination of mitigation activities, and community participation. Some of the lessons learned include:

- transparency and accountability for responsibilities have increased significantly.
- private sector involvement has been limited and needs to be increased significantly.
- small scale mitigation activities may be undertaken by a community with minimum support from the municipality.

Influencing Policy, Legal and Institutional Arrangements in Sri Lanka: The Sri Lanka Urban Multi-Hazard Disaster Mitigation Project (SLUMDMP) has addressed and influenced policy, legal and institutional arrangements for disaster management in several aspects. It has taken initiatives to orient policy-makers to integrate natural disaster mitigation into relevant policies formulated at the national level, including its successful integration into the draft National Physical Planning Policy and the final National Land Use Policy. Further, its proposals to integrate natural disaster mitigation into the Regional Structure Plans and sector level policies including those of the Urban Development Authority have been accepted. These and other successes relate to the consistent follow-up by the Project, concerned partner governmental entities, and local champions from within the local entities involved in the Project.

Managing Urban Disasters in Naga City, Philippines: Naga City, site of the Naga City Disaster Mitigation Project (NCDMP), has undertaken to identify mitigation measures, promote awareness, and integrate risk into city planning. The Project has helped to strengthen the capacity of the City to develop and implement disaster mitigation standards and practices. Factors contributing to success include renewed community pride achieved through good urban governance, strong political will, and stakeholder participation. Funding has come primarily from the city government budget, although grants have also contributed.

Central Government Initiative in India: A High Powered Committee (HPC) has been set up at the initiative of the Prime Minister to improve the country's disaster management system, working to develop a culture of quick response, strategic thinking, and prevention. At the present time there is no mention of disaster management in national law, but the work of the HPC is a significant attempt at holistic planning. Responsibility for disaster management is now being shifted from the Ministry of Agriculture to the Ministry of Home.

New Department in Thailand: Thailand is establishing a new department for disaster management (October 2002) in the national government in a major initiative to focus more attention on disaster reduction. There currently is an inter-institutional committee (the National Civil Defense Committee), and master plans for disaster management are being established at each level, with support from the national level.

Disaster Preparedness in Yokohama, Japan: In the case of Yokohama, the evaluation and enhancement of local disaster mitigation capacity was triggered by the Great Hanshin-Awaji Earthquake of 1995. A local ordinance based on the principles of self-help and mutual assistance was enacted, assigning responsibilities to ordinary citizens and business owners as well as public entities. Drills and public awareness activities reinforce and maintain local capacity.

Holistic Law in the People's Republic of China: The Law on Earthquake Disaster Preparedness and Reduction provides a holistic approach to earthquake disaster management, with stress on prevention and linkages to the state plan of national economy and social development. Responsibility for leadership is ascribed to all levels of government, and agencies at each level are charged with carrying out earthquake disaster preparedness and reduction work in accordance with their assigned functions.

Institutional Arrangements for Total Risk Management in New Zealand: A new nationwide system for incorporating risk management processes into national and local decision-making has been developed. The new framework, for which the central government is responsible, is based on principles of individual and community responsibility and self-reliance. The framework is also based on a risk management approach (analyzing, assessing, and treating risk through an open process involving stakeholders) and risk management standard developed jointly by New Zealand and Australia. A new disaster act recognizes volunteer organizations and local handling of emergencies, and it creates mechanisms for

inter-governmental coordination. Emergency management is recognized as part of the core business of both local and central government.

Discussion and Summation: Much discussion focused on the point that policy change is a long-term endeavor, and governments are usually not interested in changing. In this situation, what should NGOs do; what is their role? Governments are overwhelmed by other work so they often ignore mitigation. Also, discontinuity (turnover) in leadership slows the process of policy-making. Bringing organizations and experts from outside the country can make a difference. The NGOs and civil society organizations can facilitate discussions and meetings between the government and influential regional and international organizations, which can help in policy change. You can help politicians to understand what it can mean to them personally to do mitigation work and create constituencies for your issue. You have to think about who effects change and what motivates those people and then find opportunities to dialogue with them. Also, lessons learned from other disciplines can be applied for policy change in disaster management, and in some cases we can empower the people, not the government.

A related issue is how to convince policy-makers and professionals of their role in disaster risk mitigation? Turnover of officials is again a major issue. It is often necessary to start anew with the new person. We have to create a constituency in the government departments. The governments' role is to create an enabling environment, but some times we have to remind them of their responsibility. Empowering the people is important to make the governments accountable.

A number of common themes emerged in the presentations: political will and how to build it, leadership, perseverance, coalitions, stakeholders, advocacy, champions, and involvement of businesses as key players/stakeholders in disaster management. Linking with other initiatives and taking advantage of other opportunities were identified as key strategies to influence policy.

Hazard Mapping and Risk Assessment

Overview: Hazard mapping and risk assessment provide tools to help those in authority understand and address the effects of natural, technological, and human hazards on a community's vision for the future. They are essential to understanding and addressing risks that can interfere with a community's ability to achieve its vision. Based on the information provided through the hazard mapping and risk assessment processes, one can: (1) identify risk management strategies (doing the right things to manage risk consistent with the community's vision); (2) identify operating strategies (doing the right things in the right way to control risk); (3) identify financial strategies (providing funds in the amounts and at the right times); and (4) evaluate the effectiveness of the comprehensive community risk management program.

Risk may be defined as the likely consequences (damage, loss, etc.) that may result from the impact of an event on exposures (values at risk) with specific event-related vulnerabilities. Risk may be considered the combination of hazard, exposure, and vulnerability. Risk assessment defines the nature and severity of the risk problem, and risk evaluation focuses on evaluating what to do about the risk.

Hazard mapping and risk assessment are part of the policy and planning phases of the risk management process and therefore serve to establish its foundation. The risk management approach focuses on first developing: (1) a vision of what the community hopes to achieve; and (2) a risk management policy which sets forth the commitment of community leaders to the risk management program. The policy also establishes guiding principles for preparing plans and for translating those plans into action. Stakeholder participation is essential to developing risk management strategies that are feasible and sustainable.

Hazard Mapping and Vulnerability Assessment Processes under the Bangladesh Urban Disaster Mitigation Project: The BUDMP utilized the PRA process to assess physical damage and social disruptions. One of the key factors was the continuous involvement of the communities throughout the process. The main lessons learned from the experience was that the PRA process helped to level the expectations of the communities and also that they felt a part of the risk assessment process.

Fire Risk Assessment in Vientiane, Lao PDR: The aim of this program is to improve capacity for risk assessment and for disaster mitigation. The different elements considered for assessing risk include building types, sources of fire hazard, fire-fighting scenario, electrical systems, fire history, building

density, accessibility of roads and fire hazard zonation. The main lesson learned was that in creating the zonation maps, simple techniques were effective and there was no need for very sophisticated equipment and tools.

Hazard Mapping and Risk Assessment: Experiences of Kathmandu Valley Earthquake Risk Management Project:

The main lessons learned were that:

- simple materials designed for the target audience were the most effective.
- low-tech approach was optimal
- process transparency was important
- earthquake damage scenario was a great awareness raising tool
- stakeholder involvement resulted in greater acceptance

Hazard Mapping for Delineating Multiple Risks under the Sri Lanka Urban Multi-Hazard Disaster Mitigation Program: In this program a rapid assessment method for hazard zonation mapping was introduced, saving time and cost. Lack of data and difficulties with scale and administrative boundaries created problems in producing user-friendly maps. Meeting end-user requirements through the inclusion of clear conclusions must be accommodated so the information can be applied in policy formulation and decision-making.

Multi-Hazard Risk Assessment using GIS in Urban Areas: the City of Turrialba, Costa Rica: The main aim of the process was capacity building for natural disaster reduction and seismic risk reduction. Various elements of the risk database, vulnerability and cost assessment, vulnerability assessment, and risk assessment in terms of vulnerability and probability costs were discussed, as well as a research project for strengthening the capacity of local authorities in risk management. The resulting database can serve as a tool for local authorities in disaster preparedness and to determine the effect of certain mitigation measures.

Comparing the Risk Assessment Process in Bandung and the Rapid Risk Assessment in Replicating Cities of Indonesia: The risk assessment method used in Bandung was modified into a simpler rapid assessment process for use in other cities including Denpasar, Manado and Palu. It was found that to successfully implement the RRA process, it is important to obtain high level political support in the city, and one way was through the collaboration of the Association of Municipality Governments in organizing a lessons learned workshop to disseminate the Bandung experience. The main lessons learned were that early identification of a local champion and paying serious attention to the team building process among the different stakeholders were important.

Discussion and Summation: In the discussions, the main points raised were whether remote sensing was also used in Vientiane, on the acceptance and use of the risk maps by the senior urban planners, on the need for standardization and on the need to update the maps on a regular basis.

The common elements among these case histories include: a) simple language; b) low cost; and c) compatible with the capacities of the stakeholders. In terms of the process and methodology, it was important to involve the stakeholders from the beginning and to match the methodology with the application. Some questions that need to be looked into were: a) who maintains the maps and outputs? and b) who owns them?

Capacity Building

Overview: Capacity building is identifying, developing and enhancing the existing capabilities and coping mechanisms of communities. Capability refers to inherent skills and knowledge or ability to respond; coping mechanisms are collective mechanisms derived from internal social systems and structures present in a community, and strategies adopted by them to deal with adverse and stressful situations.

Capacity building, as a process and non-structural approach in urban disaster mitigation, should address vulnerability and its root causes and be integrated into the development process so that it can contribute to sustainability, empowerment, and community resilience. A fundamental goal of capacity building, as per the United Nations' Agenda 21, is to enhance the ability to evaluate and address the crucial questions related to policy choices and modes of implementation among development options, based on an understanding of environment potentials and limits and of needs perceived by the people of the country concerned." (Chapter 37, UNCED, 1992)

There are many approaches for building capacities, including training, public awareness, policy advocacy, community organizing, institutional networking, income generating projects, and emergency response. There are also multiple actors in the process. As the concept of capacity building encompasses the major aspects affecting the community – political, social, economic, and cultural, capacity building should focus on multiple stakeholders – their strengths, needs, and priorities.

Capacity Building: Experiences of the Kathmandu Valley Earthquake Risk Management Project: The approach taken by the project was to integrate institutional strengthening, training and education into the project activities. In addition, the Disaster Management Unit of Kathmandu Municipality was strengthened on an experimental basis. The project took special care to respect local wisdom, traits and coping mechanism, and took a mixed approach of informal education and formal training courses such as Urban Disaster Mitigation (UDM) and Earthquake Vulnerability Reduction for Cities (EVRC).

Developing and Delivering National Disaster Mitigation Courses and Training Technical Personnel in Sri Lanka: Various target groups were identified, and design and delivery of specific need-based courses were tailored to each group. The main lessons learned were addressing language barriers, need for developing materials in local languages, need for a glossary of technical terms, and preference for short courses.

Institutional Arrangements and Capacity Building of Colombo Municipal Council: Colombo has developed the Emergency Management Committee within the Municipal Council to deal with natural and human-made disasters. One of the objectives of the Committee is to develop skills and plan for risk reduction as well as to assess capabilities for disaster management and develop strategies. Issues faced are limited coordination with various institutions/agencies and limited funding.

The Great Hanshin-Awaji Earthquake Memorial Disaster Reduction and Human Renovation: Enhancing Capacity of Local Government Leaders: In Japan the disaster management system includes roles and responsibilities at the national level, at the prefectural government level and at the municipal and resident levels. Based on the problems faced during the Hanshin-Awaji earthquake of 1995, the importance of upgrading the capabilities of local government staff was realized, and three types of human resource development programs were implemented for different target groups.

The capacity-building experience in Indonesia, presented in relation to Training of Teachers and Lessons Learned from the IUDMP raised several issues that were discussed, including whether assessment was carried out prior to training, who bears the cost of training, the role of consultants and donor agencies and how can you sustain the learning from training programs if disasters do not happen. In Bandung, they did some assessment and tested the progress before and after the earthquake. In regard to consultants, the government and donor agencies are responsible to insist that their designs and construction meet proper standards. But it is difficult to ensure that construction actually follows the standards.

Discussion and Summation: Another issue is sustainability of capacity building efforts: when you engage in mitigation activities and a disaster does not occur, people forget. How can we sustain people's interest? All training institutions and educational institutions should reserve some funds to teach and train their audience on disaster mitigation. In Nepal, NSET worked with the local community to raise their awareness about the risks their children faced in school and then they worked with the masons to train them on mitigation techniques. This was taken up by the community people because they were aware of the risks. Thus you need to create demand among the community or stakeholders for sustainability.

Regarding the cost of training, it should not be paid only by the trainee but by all, because it is for everybody's benefit. Thus government and international funding is important. Also, training through the education system is less costly. A good strategy is to train our future generations, although a counter argument can be made that we should focus on engineers or on masons; these two strategies represent different perspectives.

Capacity building relates to vulnerability reduction efforts. The presentations pointed out that the current capacity and coping mechanisms of the target groups should be considered in designing capacity building programs and that the design should be initiated internally.

Some of the key lessons learned from the capacity building initiatives in the region were: a) understanding the context of capacity building; b) targeting the right groups and designing a process in which they are involved; c) answering issues of language and contents and the appropriate duration for training; and d) monitoring the impact of training. The task is huge.

Mitigation Planning and Implementation

Overview: Mitigation planning is the development of a strategy for reducing the impact of disasters on a community, facility, agency, city or country. Ideally, mitigation or disaster reduction planning is a broad priority-setting exercise to coordinate the efforts of multiple agencies and levels of government and society. The growing trend for communities, cities and countries to develop mitigation plans derives from the ongoing shift in the disaster field from post-event relief and recovery to pre-disaster preparedness, planning and mitigation and the decentralization of government responsibilities in many countries of the region.

Mitigation planning promotes a risk-based approach to development in which sustainable development is based on an understanding and management of all risk – physical, environmental, economic and social. This total risk management approach integrates the proactive mitigation of disaster risk with sustainable development, which is an essential part of making cities and communities sustainable. By integrating goals for disaster mitigation into annual municipal or department budgets and other regular development mechanisms, governments can achieve the long-term efforts necessary to reduce disaster vulnerability.

Mitigation plans reflect an emphasis on pre-disaster activities to manage risk and reduce the impact of future disasters. At the same time, mitigation plans are also being developed as part of disaster recovery and reconstruction efforts. National agencies, as well as international agencies such as the World Bank and Asian Development Bank, have begun to require the development of mitigation plans or the inclusion of mitigation features as part of their plans and funding for disaster reconstruction.

Three groupings of plans are based on the processes that developed them. They are: government-developed plans; grassroots/citizen-led plans; and integrated private-public plans. Government-developed plans have the advantage of being better resourced, drawing on regular government operating budgets, staff or facilities, or on annual budgets for infrastructure or training. Government-developed plans may also carry additional weight due to the official mandate of a plan. However, if they fail to consult with vulnerable communities, they may not address local issues and priorities and they may lack accountability to a local community.

Grassroots mitigation plans developed through involvement of non-governmental organizations and community-based organizations benefit from public involvement and support, particularly useful in mitigation efforts that involve public awareness or social marketing efforts focused on changing behaviors. Grassroots efforts, however, may lack large or consistent resources to invest in long-term efforts or structural mitigation measures.

Some of the most effective mitigation planning exercises incorporate both government and grassroots elements into partnerships between government and civil and private organizations. These private-public partnerships integrate the financial resources and regulatory role of the government with the activism and resources of civil society organizations and the private sector.

The following elements are essential to mitigation planning and common features of many plans: building awareness and understanding of risk; involving key stakeholders; community participation; and implementation issues including prioritization, cost-benefit analysis, and resource mobilization.

Development of Risk Based Methodology for Mitigation Planning in Ratnapura and Nawalapitiya, Sri Lanka: Experience of the SLUMDMP with the risk-based methodology used in Ratnapura and Nawalapitiya yielded the following primary lessons learned:

- political support and cooperation of all stakeholders was essential for successful planning
- early identification of resource persons led to minimizing delays
- adequate budgetary provision was necessary
- the commitment of planners and other officials was essential for effective use of the methodology.

Mitigation Planning through Community-Based Approaches in Bangladesh: Some of the main lessons learned from the BUDMP model and process were: a) insufficient data at the municipal level; b) large resource requirements; c) no master plan for the municipality; d) insufficient initiative by the municipality for public awareness; and e) the emphasis by the community for hard interventions rather than softer options.

Mitigation Planning and Implementation: Experiences of KVERMP: The project developed a participatory approach and methodology for mitigation planning and implementation of the action plan. The lessons learned are: a) scenario and action planning process was a very strong awareness raising tool; b) retrofitting of public buildings such as schools was affordable; c) School Earthquake Safety Program was a must for grassroots level mitigation work; d) awareness raising became integrated in all project components; e) low-tech approach was optimal; and f) efforts at transparency were difficult but valuable.

Mitigation and Planning: the Naga City Experience: The concepts adopted by Naga are: a) the all hazards approach; b) the comprehensive approach incorporating prevention, preparedness, mitigation, response and recovery; c) the all agencies approach; and d) the prepared community. Lessons learned in the steps taken by the city for mitigation planning and implementation are: the need to incorporate issues related to poverty alleviation while interpreting the concepts of disaster management, and the need to take mitigation and rehabilitation efforts as part of a locality's overall development program.

Mitigation Planning and Implementation: Experiences from the Caribbean Disaster Mitigation Program: This program, which served as a model for the AUDMP, placed much emphasis on working with the private sector—the owners and operators of vulnerable structures and systems that can put you out of business. It is important to look at the trade offs and choices in deciding on mitigation measures, e.g. for school life safety or continuity of service.

Discussion and Summation: In the ensuing discussions, participants raised points related to the involvement of communities in the planning and implementation process, the role of government agencies in the various partner countries, and some specific queries on the experiences in some of the projects.

Some of the common themes and issues that emerged from the presentations and discussions were: a) involving stakeholders throughout the process; b) ensuring political commitment and support for successful implementation; c) devising innovative ways of resource mobilization; and d) successfully integrating mitigation in development planning.

Promoting Safer Building Construction

Overview: Earthquakes do not kill people; unsafe buildings do. The imperatives for promoting safe building construction in the context of disaster related structural and non-structural risks are:

- saving of lives of human beings and animals
- saving of limited, costly and scarce resources of building materials and money (finances) from the loss of buildings, properties and infrastructure

- reduction in economic losses due to negative impacts on economic/industrial activity and social and welfare areas like health, education and community well being
- reduction in loss of time in planning, design, reconstruction phase lasting from 1 to 5 years or more
- reduction of trauma, physical and mental ill being of the affected community
- providing confidence among the community about the safe, strong, durable condition of houses, schools, health centers, community centers, offices, commercial establishments, and industrial production units in normal times and disaster times (during and after).

While many countries have developed sophisticated building codes with special disaster resistant design and construction codes, implementation and enforcement have been more of an exception than the rule. Most of the developing countries in the Asian region suffer from the lack of an effective techno-legal regime and techno-financing regime. Further, in the developing countries context in the region, nearly 70% belong to the economically weaker sections and low income group neighborhoods, where building construction activity occurs without the association of professional technical personnel. Therefore, there is an urgent need to bring into force simple, user friendly, non-engineered construction practices for use by the community and the construction artisans. There is also demand for creating grass root level technology transfer mechanisms for translating technical 'know-how' to hands-on 'show-how' practices.

Major elements for promoting safer building construction highlight on: a) awareness, b) appreciation, and c) application. There are three critical areas of action for promoting safer building construction: (1) developing awareness of vulnerability and risk; (2) developing appreciation among the general public and building delivery system regarding the differences between safe and unsafe buildings in the context of the disaster related additional forces, loads and effects; and (3) ensuring an enabling environment for application of the appropriate norms for ensuring structural safety, fire safety and health safety to deal with disaster related response. This includes regulatory mechanisms and enforcement systems. Also, there is need for an appropriate techno-legal regime (e.g. mandatory standards and codes) and techno-financing regime (e.g. the provision of financing mechanisms through government, financial institutions, micro-credit organizations, housing finance companies, etc.).

Other critical components for a comprehensive approach to promoting safer building construction include:

- dissemination of cost effective, appropriate and disaster resistant technologies
- development of effective means and guidelines for retrofitting and strengthening structures
- employing “show-how” techniques for grass root level application of good construction practices
- using the construction medium as a message to propagate safer technologies
- using media in disseminating information
- targeting young professionals
- taking steps to ensure quality in construction.

Promoting Safer Building Construction: Experiences of KVERMP: The project worked with a variety of different organizations to promote safer builder construction. The main lessons learned were: a) institutionalization is a long-term process; b) retrofitting was a feasible option; c) more than one approach may be needed at times; d) programs like the one on school safety need to be continued.

Ensuring Safer Building Construction: Practices in Sri Lanka: The main activities undertaken by the project were: a) development and publication of Guidelines for Construction in Disaster Prone Areas; b) development and publication of Guidelines for Stabilization (in areas prone to landslides); and c) training and awareness for relevant personnel at the local and national levels. The main lessons learned were: (i) political will and support were crucial for success of such activities; and (ii) successful implementation of project activities created a ripple effect with others initiating similar activities.

Safer Shelter for Flood and Typhoon Areas in Vietnam and Establishing Community Capacity to Reduce Vulnerability to Economic Loss caused by Storm Damage to Houses in Central Vietnam: Vulnerability of domestic shelters was a critical though under-addressed issue. Preventive actions to reduce the risk were taken by implementing interactive programs in each village and working with women's groups, schools, local communities and establishing a strong relationship with the local government. The main lessons from these two experiences were: a) that preventive measures and community involvement can

be effective in risk reduction; and b) there is a need to upscale and expand such interventions so that there can be broad-based impact.

Promoting Safer Building Construction in India: SSP, an NGO, worked in rural Maharashtra and Gujarat states after the Latur earthquake of 1993 and the Kutch earthquake of 2001. Multiple approaches, operational steps, capacity building methodologies and monitoring tools were used. The main lesson learned was that facilitating community participation was the most effective tool to ensure that the community adopted safety and quality features in constructing safer buildings.

Discussion and Summation: The main points raised during the discussions on the theme related to use of traditional vs. modern materials, quality auditing, techniques for engineered and non-engineered buildings and insurance for houses. The following are needed for a holistic approach to disaster risk reduction: public awareness, strong policies, trained engineers, and trained search and rescue teams.

The following points should be emphasized: a) creating awareness of vulnerability; b) establishing an appropriate techno-legal regime; c) adopting the techno-financing regime; d) creating awareness among general public for application; e) evolving models for promotion of non-engineered construction systems; f) using the media for mass dissemination; and g) mobilizing participation of civil society.

Community-Based Approaches to Disaster Mitigation

Overview: In any disaster, people at the community level must use coping and survival strategies to respond to the situation long before outside help from NGOs or the government arrives. Community-based disaster management responds to the growing recognition of the need for community participation to ensure sustainable disaster reduction. The community-based approach also corrects the defects of the top-down approach in development planning and disaster management which has often failed to address local needs and ignored the potential of indigenous resources and capacities.

CBDM covers a broad range of interventions, measures, activities, projects and programs to reduce disaster risks which are primarily designed by people in at-risk localities and are based on their urgent needs and capacities. The aim of CBDM is to: 1) reduce vulnerabilities and increase capacities of vulnerable groups and communities to cope with and prevent or minimize loss and damage to life, property, and the environment, 2) minimize human suffering, and 3) hasten recovery.

The following basic elements and features of CBDM apply as well to the community-based approaches to mitigation:

- community participation: community members are the main actors and direct beneficiaries of disaster risk reduction and development.
- priority for the most vulnerable groups, families, and people in the community
- risk reduction measures are community-specific and are identified after an analysis of the community's disaster risk (hazards, vulnerabilities and capacities and perceptions of disaster risk)
- existing capacities and coping mechanisms are recognized
- aim is to reduce vulnerabilities by strengthening capacities; goal is building disaster resilient communities
- links disaster reduction with development
- outsiders have supporting and facilitating role.

Sustainability is enhanced through the presence of an organizational mechanism, the Disaster Management Committee (DMC) or grassroots disaster response organization, to see the risk reduction process through. Grassroots organizations can mobilize the community at large and serve as the focal point for local leadership and responsibility. Community participation can be sustained if the risk reduction project responds to their immediate needs and they are involved in the study and decision process to identify realistic and doable mitigation and preparedness solutions.

The results of the community-based approaches to disaster mitigation are vulnerability reduction solutions which are more relevant and in tune with what people need and want. Because community members have been involved in the whole process of problem identification to ranking/prioritizing

solutions, they have ownership of the project. Popular and appropriate methods and channels in public awareness and information dissemination ensure that community members are included in the information and decision making loop. Schemes for project implementation take into account preferences of the community. Community participation builds confidence, skills and ability to cooperate, thus enabling the participants to tackle other challenges and bigger problems at the individual, household and community level.

Cambodian Community-Based Flood Mitigation and Preparedness Project: Experiences and Lessons Learned: This project undertook the following activities: a) empowering communities to develop solutions to flooding; b) training local village volunteers; c) establishing Village Disaster Committees; and d) mobilizing funds to create or refurbish disaster preparedness infrastructures. The main lessons learned were: (i) use traditional organizational structures in communities; (ii) ensure that community level implementers are well trained; (iii) help communities develop linkages with other communities and government departments and donors; and (iv) distinguish between activities that are useful for community organizers and the community themselves.

Community Participation in Urban Flood Mitigation under BUDMP: The main lessons learned from this community participation project were: a) if communities feel that programs/projects reflect their interests then they will become involved and also put in resources; b) though it is time-consuming, community participation is a cost effective and sustainable method; c) coping mechanisms and indigenous knowledge of the community must be respected and used; and d) a two-way formal and informal communication process was important.

Community Participation in Disaster Mitigation in Nawalapitiya Urban Council, Sri Lanka: Issues that arose in involving communities were: a) poverty, b) fatalistic attitude of people, c) other priorities, as disasters were not too frequent, d) language barriers, and e) limited commitment and involvement of the political leadership.

Community-Based Approaches to Disaster Mitigation: Experiences from Kathmandu Valley: After training in Community-Based Disaster Mitigation, the Ward 34 Disaster Management Committee members carried out, with community participation, household surveys on vulnerability, training for students and residents and preparation of hazard maps. In addition they mobilized resources through voluntary donations from local residents and other NGOs/INGOs.

Empowered Individual: Caring Neighbors Make the Best Disaster Managers: After the Gujarat earthquake, this rehabilitation program worked in three stages, namely the strategic level, the local community plan and the action plan. In order to make the program sustainable, there was focus on: a) people's knowledge rather than infrastructure; b) improving livelihood options; c) empowering individuals; d) strengthening local institutions; and e) partnership with the government.

Discussion and Summation: Resources must be mobilized to sustain community involvement and participation. It is important to link the interventions to livelihood options and choices for the communities.

The various case studies showed the importance of involving communities throughout the process of disaster mitigation. The key success factors were: a) use of best practice methodologies; b) use of traditional knowledge and organizational structures; c) capacity building of community leaders and people; d) public awareness; and e) multi-stakeholder leadership.

Climate Applications and Preparedness

Overview: Climate forecasting applications and preparedness, implemented effectively, are important in reducing the losses from disasters such as floods, drought, cyclones and landslides, and thus, in strengthening the sustainability of livelihoods in communities. ADPC's Extreme Climate Events Program implemented in Indonesia, the Philippines and Vietnam, and the Program on Climate Forecasting Applications in Bangladesh facilitate dialogue between the climate science community and the end users of climate information at the community level to ensure relevant and usable information that is made easily accessible to communities at risk.

Climate variability associated with the El Nino Southern Oscillation (ENSO) can have dire implications across a range of socio-economic sectors in Southeast Asia. However, recent developments in the science of climate forecasting coupled with growing capacity at national meteorological services and ongoing dialogue with affected sectoral agencies have enhanced the ability to understand the local climatic implications of the El Nino Southern Oscillation.

Historically, urban centers have been notoriously vulnerable to climate variability and extreme events, due to the enormous scale of potential damages, the large populations at risk, the reliance on built infrastructure, and the potential economic impacts associated with damage to capital investments and disruption to core economic activities.

Food security, public health, water resources and built infrastructure have been identified in a number of assessments as key sectors that are highly sensitive to climate variability and extreme events. For instance, there are strong links between the water and public health sectors. One of the biggest impacts on public health has been water-borne illness associated with extreme climate-related events. Also, in many cities, access to potable water is not universal, and there is a very real risk that the supply needs of growing populations and industrial uses will not be met. Current climate impact assessment methodologies for water resources rely on indicators such as rainfall distribution which give little lead-time to formulate strategies for intervention before the occurrence of extreme weather events like floods and drought.

Many governments and related disaster management organizations throughout Asia have already initiated Early Warning Systems; though, the systems vary widely in their capacity to produce and communicate effective warnings. The same is true for capacity for generating and communicating seasonal forecasts. The five general components of effective early warning systems are:

- risk Assessment, including hazard assessment and vulnerability analysis
- hazard detection and prediction
- formulation of warning messages
- dissemination of warning message
- community response.

Addressing and adapting to current climate variability will enhance resilience to future climate change associated extreme events. Climate information can be applied for safer cities as follows:

- Use past climate information to incorporate climate trends into city's development planning
- Establish institutional framework for generating and applying climate forecast
- Adapt to known extreme climate events as a way to manage future climate change.

The use of climate information requires: (a) strong local institutions; (b) well functioning processes for information dissemination, and (c) trust and motivation of the end-users. ADPC and other institutions can facilitate the creation of institutional environment to put in place end to end climate information (of all time scales) and application systems.

Application of Climate Forecast Information in Metro Manila: The 1997-98 El Nino episode impacted various sectors of society, including water resources and agricultural sectors, health, hydropower, environment, industry, etc. The allocation of water for the various users during this event highlighted the importance of climate forecast information for the effective operation of the Angat reservoir. Coordination of various agencies was necessary to develop and implement appropriate response strategies and mitigating measures. As decision-makers come to understand the effects of extreme climate events, they will gain confidence in using climate forecasts for development and management decisions.

Vulnerability and Adaptation Assessments of Angat Reservoir to Climate Change: Water resources are threatened by population growth, domestic sewage, industrial waste, groundwater extraction, and watershed degradation. This study was undertaken to assess the potential impacts of climate variability/change on surface water resources in the Philippines and to be able to identify, evaluate and prioritize possible adaptation strategies in mitigating potential adverse effects of climate change. Results

show that changes in rainfall and temperature in the future are critical in Angat's future inflow. Recognizing the vulnerability of water resources to climate change, adaptation measures were identified, including enhancement of the monitoring and forecasting capability of extreme events, comprehensive watershed development, and enhancement of irrigation efficiency.

Application of Climate Forecast Information in Urban Cities of Malaysia: Drier weather and extreme weather events are showing an impact on urban populations and posing a burden on the government. A water crisis has been brewing for some time, as growth in water use has been outstripping the supply capacity. Now, the relevant agencies are beginning to appreciate the need for seasonal forecast and the need to work together. Advance climate information provides the basis for appropriate strategies to take for water resource management and to avoid water crises.

Flood Management of Dhaka City: An important issue to consider is how you use technical information and language while working in communities. In Dhaka City, they have organized the community to use the flood information. The warning is given by the Flood Forecasting Center and used at community level. It is being tested this year. They issued the warning and the community takes action. They found that some people listen but others don't, and it has a great value to the rural people, the local people.

Urban Vulnerability to Drought in Thailand: Urban areas in Thailand such as Bangkok and Chiang Mai are vulnerable to drought, and urban population growth is affecting vulnerability. Seasonal forecasts are prepared based on statistical analysis, ENSO conditions, and seasonal forecast products from various centers. Issues in coping with drought impacts centers on forecast reliability, education and training, need for sufficient resources for prevention or mitigation, and lag time between forecast and impacts and responses.

Discussion and Summation: On the issue related to the use of scientific and technical information by the community, the experiences in Bangladesh and India showed that if such information was conveyed on time, the communities took preventive action to prepare themselves. The main issue here was the use of appropriate language so that stakeholders at different levels understood the information. Another issue discussed was that of the accuracy of forecasts.

With broader numbers of stakeholders and players involved, it is important that appropriate language be used to ensure communication amongst policy makers, managers and others. What is the comprehension of these subjects by policy and decision-makers and their motivation? In Malaysia the Minister himself and even the Prime Minister is very interested in the subject, in taking information to the community level. They are actually taking the information to the Minister, so that the Minister is aware of what is happening and the other authorities are also aware. This can help in taking actions for the future. The other critical factor is also the micro-climate-change that is happening. It hits small areas, and this is a trend that needs to be studied.

Program participants have found in the past four years' work that policy makers try to understand. They would like to see how the whole institutional mechanism is set up to move the information from the center to the community. Once the actual application of information from forecasting to taking action is demonstrated, and they can see it, they will appreciate it, because seeing is believing.

A number of stakeholders are involved in the whole process. Policy makers can use forecasts, but they benefit more by analysis of the forecasting information and its impacts, like what will be the impact of climate change on economy, water, agriculture etc. In the case of Philippines the Department of Agriculture is using Program forecasts regarding El Nino phenomena. Thus it is a challenge for the forecasters to ensure that the forecast is precise, because the decision makers are really relying on the forecasts.

The experiences from different cities including Kuala Lumpur, Dhaka and Manila showed that climate variability was aggravated by societal factors like huge population increase and unplanned and rapid urbanization. However there were also new developments such as a better understanding and prediction of El Nino, availability of long-range forecast products from global centers, understanding of climate change, and understanding of the usage of climate information in the risk management framework. The use of climate information required:

- strong local institutions
- well functioning processes for information dissemination
- the trust and motivation of the end users.

Organizations such as ADPC can facilitate the creation of an institutional environment to put in place end-to-end climate information and application systems.

Public Awareness and Social Marketing

Overview: Public awareness in risk communications is the process through which people living in hazard-prone areas come to realize and understand that they live in areas of risk, know the specific dangers that they are exposed to and the warnings that are issued, and know the appropriate action to be taken to protect their lives and minimize property damage. Social marketing is the process of marketing the risk communications message to our audience by learning the cultural identifiers of our audience and crafting our outreach activities to meet their specific needs in a customized approach.

Public awareness and social marketing are critically important as there is competition among problems in all societies, but especially so in the developing countries where there were many demands on scarce or limited resources. It is important to turn data into intelligence. The overall goal is to motivate our audiences to act. Customizing approaches, tools and messages could do this.

We need to learn about our audiences: who they are, how they think and what impacts their unique decision making process. In doing this we can begin to reach all population segments of a community. By engaging in a social marketing process, we are better equipped to design customized public awareness tools, messages and informational/educational campaigns. We can more effectively choose our distribution methods and develop strategies that engage the target audiences more effectively.

Once we understand our community or our target audience, we can then begin to develop strategies and approaches to build public awareness for risk reduction. Basic principles for beginning our strategy development are:

- reflect our audience's needs and customize
- incorporate local community perspectives
- aggressively involve community leaders
- create two way communications
- speak with one voice on message issues (particularly if partners are involved)

Journalists use five main questions that provide a structure that can be used to develop public awareness approaches and tools. These are: who, what, where, when, why, and how? Some issues to consider include:

- Who should participate and how?
- How do we translate technical information for different users?
- What media is best to work with?
- How do we institutionalize our efforts at a national level?
- How do we make sure that the language in appropriate is translations?
- How do we measure our performance?

Raising Public Awareness through Public Campaign under the BUDMP: Tools used by the project included: dramas, workshops, displays, bill boards, training and orientation, mass media, cinema hall and video documentaries. The project also monitored the effectiveness of the use of different methods and tools. Consensus was achieved with all project partners on the following points for public information:

- use symbols and language that are easy for the community to understand
- attractive but not funny
- realistic and easy to understand
- follow the national broadcasting system

- replicable: use various means of conveying the same message
- highlight problems but information is solution oriented

The conclusions were: a) initiatives were useful for the targeted audience; b) impact was encouraging; c) initiatives on a larger scale would have greater impact than what was achieved by the project.

Public Awareness and Social Marketing: Experiences of the KVERMP: A key to successful efforts was to use different approaches for different target audiences. In the Kathmandu Valley, the institutionalization of the Earthquake Safety Day (ESD) has played an important role in raising mass awareness.

Effective Public Awareness Strategy for Disaster Mitigation: Examples from Sri Lanka: The project considered the needs and characteristics of each group prior to designing the approach and strategy for public awareness. Key lessons learned from the project's experience were: a) audience specific campaigns and programs; b) use of local language; c) short courses preferred; d) working with NGOs proved to be successful; and e) payment of DSA was an attractive incentive.

Developing Public Awareness Materials: Design Principles: The basic rules of good communication are: a) keep it simple; b) say one thing; c) quick information retrieval; and d) reinforce the message. In designing materials, the culture of the audience is an important aspect as design is mostly culture-specific.

Discussion and Summation: The main points raised in the discussions were: a) different ways and indicators to measure quality and effectiveness; b) public awareness needs to be carried out on a continuous basis; and c) how to ensure maximum utilization of the limited resources.

Highlights of the case studies are:

- The Bangladesh case showed the importance of design being culture-specific and the involvement of the community
- The Sri Lanka example highlighted the need to use local languages, have short-duration courses/training and use NGOs as partners
- In the case of Nepal, the public awareness program was integrated into all project components, and different strategies were used for different audiences. The example also showed the need to be creative and how to effectively use the basic design principles.

In terms of overall lessons: a) it was important to involve communities; b) create ownership; c) be creative and take risks; d) ensure two-way communication; e) evaluate and measure effectiveness; and f) celebrate successes.

Linkages and Common Threads

Throughout the workshop it was clear that the eight themes are inter-related and overlapping. It is possible to think of them as pieces of a puzzle, but in reality the boundaries between them are not so clear cut. Mapping and risk assessment are the basis for mitigation planning and implementation. If there are weaknesses in disaster policy, laws, and institutional arrangements, the entire apparatus or system for dealing with risk will be prone to failure. Without public awareness and social marketing, there will be no public involvement, no political will, and no community-based disaster management or mitigation. Without safer construction practices throughout urban and rural areas alike, and adequate warning and preparedness, we are doomed to needless loss of life in earthquakes and extreme climate events. And unless we build capacity to deal with the risk and the disasters we confront, we are helpless and cannot avoid losses, pain, and suffering. So, all the themes are critically important in a holistic approach to disaster risk management.

There were many common threads and themes through the workshop sessions, with one case study in one session reinforcing the key points from another case study in a different session. The rich array of lessons learned could only be briefly introduced in this paper, but here I will elaborate on two lessons learned that particularly resonated with me.

Out in our communities or in dealing with our government structure, we often hear that we have no resources for disaster mitigation. But during the workshop we heard a number of experiences where the lack of resources has not stopped mitigation. For instance, it was noted that in Bangladesh, “the community was not fully well aware of their own social resources before the assessment.” Communities have hidden resources, not the least of which is tremendous energy which can be mobilized as community contributions in community-based projects. The experience of SEEDS India, participating in rebuilding the village of Patanka after the Gujarat earthquake, illustrates that community participation in mitigation can contribute to community empowerment and even to strengthening livelihoods and improving the quality of life.

Another very salient point was that we have to make choices, and each choice has tradeoffs. Communities make choices every day, and if we are going to impact community choices, we must understand and respect the landscape and earn the trust of the community. Communities know what is feasible and sustainable in their own distinct reality, and we should never underestimate the power of local initiatives. We saw, for instance, citizens raising the elevation of structures vulnerable to flood in Bangladesh, one hand-carried basket of dirt at a time.

Some major threads that recurred throughout essentially all the sessions were the importance of:

- Leadership and political will
- Community participation and empowerment
- Developing awareness and understanding of risk and risk reduction measures, e.g. safer building construction
- Integration of disaster risk management into development processes
- Mitigation and preparedness as elements of vulnerability reduction
- Total risk management approach.

Key Issues and Challenges

Anticipate the future: The natural and built environment is constantly changing, and the threat posed by hazards is constantly changing. Therefore, disaster mitigation laws, institutions, plans, programs and processes must anticipate unpredicted changes and be adaptable to new knowledge and conditions.

Institutionalize: Often, good policies, systems, plans, or regulations are in place but they are ignored, or they make little impact on practice. For policies to make an impact, they must be constantly taken into account in routine decision-making and they must be institutionalized (integrated into the laws, practices, and customs of the society).

Recognize disaster management as a core function of government: Governments exist to protect the rights and welfare of their citizens and to address common societal and economic goals. As their most important function is to ensure the safety and well being of society, disaster management is a core function of government and should be explicitly recognized as such.

Assure coordination and assign responsibilities: Coordination and cooperation among government and non-governmental organizations is necessary for integrating mitigation into development planning and getting it implemented. Functions and responsibilities must be formalized and accepted by all the involved entities.

Address the challenge of decentralization/devolution: In many countries, there is a drive toward devolution of powers, authorities and responsibilities from higher levels of government to lower levels of government. However, local governments may not possess adequate resources, expertise, and political commitment, which must be developed through training and capacity-building programs.

Integrate disaster mitigation into all levels of society: We need to create constituencies for mitigation in all sectors of government and civil society through capacity building, community-based disaster management, and public awareness and social marketing.

Integrate quality control and measure effectiveness: Quality control is essential not only to construction processes but to all mitigation efforts. Unless we measure and can demonstrate the effectiveness of awareness, preparedness, and other mitigation activities, we are unlikely to achieve sustainability and political will.

Build sustainability: We must always look beyond our current effort, activity, or program and develop strategies to ensure that interest and commitment are sustained.

Develop political will: Leadership is key to success. By raising awareness and understanding of risk and offering feasible, cost-effective solutions to risk problems through partnerships with scientific, technical, and business organizations, we can promote and sustain the political will necessary to implement mitigation measures.

Conclusions and Next Steps

While numerous lessons learned were identified and discussed at the workshop, research shows that time after time, the same mistakes are made in disaster after disaster. But this workshop was about successful examples of where what we've learned IS being applied. So unless we all take what we heard in this workshop and share it with others back home and even more importantly act on what we hear, we will have lost the opportunity to make a difference in our communities.

The purpose of the workshop was to showcase best practices, mechanisms, strategies, and practices, and this was clearly accomplished. We discussed every major aspect of comprehensive risk management and gained insights on how the pieces fit together. To follow up on the workshop, ADPC has committed to releasing a Workshop Proceedings comprised of a document including all of the papers and a CD of the presentations.

The workshop represented the motivation and momentum with which things are moving. A wealth of wisdom, passion, knowledge, and commitment was evident. The exchanges during the presentation and discussions were very rich and reflected, in many issues, the cutting edge of what is happening internationally.

Several important issues raised in the workshop provided an agenda for more work in the future. These include: a) how do we benchmark/measure ourselves; b) the importance of bigger issues such as climate change and its implications; c) mitigation in the context of sustainable development; and d) placing emphasis on community involvement and partnerships.

The success of this workshop is not here but in the communities where we work and the alliances that the meeting helped to build. It is not what has been said that's important; it's what each of us do when we go home. It is "the power of one."

This regional workshop recognized the benefit of holding a multi-disciplinary and multi-sectoral conference on disaster mitigation in Asia. In fact, the first meeting of the Regional Consultative Committee on Regional Cooperation in Disaster Management (RCC) convened by ADPC in November 2000, recommended an Asian Regional Conference on Disaster Mitigation.

As part of ADPC's goal to facilitate partnerships and promote exchanges of information, experiences and expertise, ADPC plans to lead and co-organize this initiative with other international and regional organizations in 2005.

In addition to the organization of workshops as forums for interactive learning and information exchange, ADPC also aims to develop and promote approaches, methodologies and tools for specific target groups working in the field of disaster mitigation.

As a result, ADPC is in the process of developing a Primer on Urban Disaster Mitigation in Asia. The Primer aims to: provide policy- and decision-makers with convincing arguments on the importance of disaster risk management and the steps to be taken; and serve practitioners as a state-of-the-art "how-to" guide and reference on good practices in urban disaster mitigation in Asia. This reference and its use in

workshops, seminars and training courses endeavors to promote awareness, building capacity and contribute to the mainstreaming of a holistic approach to disaster mitigation.