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Asian Urban Disaster Mitigation Project

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List of Acronyms

ADB	-	Asian Development Bank.
ADPC	-	Asian Disaster Preparedness Center-AIT (Bangkok).
AIT	-	Asian Institute of Technology (Bangkok).
APDC	-	Asia and Pacific Development Center (Kuala Lumpur).
ASEAN	-	Association of South East Asian Nations.
BOI	-	Board of Industry (Sri Lanka).
CASA	-	Church's Auxiliary for Social Action (India).
CEA	-	Central Environmental Authority (Sri Lanka).
CEPT	-	Center for Environmental Planning and Technology (India).
CISIR	-	Ceylon Institute for Scientific and Industrial Research (Sri Lanka).
CNDR	-	Corporate Network for Disaster Response (Philippines).
DCC	-	Disaster Coordinating Council.
DMI	-	Disaster Mitigation Institute (India).
DMTP	-	Disaster Management Training Program (UNDP-UNDHA)
EEC	-	European Economic Community.
EIA	-	Environmental Impact Assessment.
GIS	-	Geographical Information System.
GNP	-	Gross National Product.
GOI	-	Government of Indonesia.
GOP	-	Government of the Philippines.
GRDC	-	Geological Research and Development Center, Bandung (Indonesia).
GSL	-	Government of Sri Lanka.
HAKI	-	Indonesian Society for Structural Engineers.
HG	-	Housing Guaranty.
IAEE	-	International Association of Earthquake Engineering.
ICIMOD	-	International Center for Integrated Mountain Development (Nepal).
ICWRM	-	Improving Cyclone Warning, Response and Mitigation.
IDNDR	-	International Decade for Natural Disaster Reduction.
ITB	-	Institute of Technology, Bandung (Indonesia).
ITS	-	Institute of Technology, Surabaya (Indonesia).
JICA	-	Japan International Cooperation Agency.
LNI	-	Lead National Institution.
LTI	-	Lead Training Institution
MNDR	-	Mindanao Network for Disaster Response (Philippines).
NARA	-	National Aquatic Resources Agency (Sri Lanka).
NASC	-	Nepal Administrative Staff College
NBRO	-	National Building Research Organisation (Sri Lanka).
NGO	-	Non-Governmental Organisation.
NIUA	-	National Institute of Urban Affairs (India).
NSET	-	National Society for Earthquake Technology (Nepal).
NWSDB	-	National Water and Sanitation Drainage Board (Sri Lanka).
OFDA	-	Office of U.S. Foreign Disaster Assistance, USAID.
PAGASA	-	Philippine Atmospheric, Geophysical and Astronomical Administration (Philippines)

PCU	-	Petra Christian University, Surabaya, Indonesia
PHIVOLCS	-	Philippine Institute of Volcanology and Seismology (Philippines)
PMP	-	Prevention, Mitigation and Preparedness.
PMT	-	Project Management Team.
RHUDO	-	Regional Housing and Urban Development Office, USAID.
UDA	-	Urban Development Authority (Sri Lanka).
UN-DHA	-	UN Department of Humanitarian Affairs.
UNCHS	-	United Nations Center for Human Settlements (HABITAT).
UNDP	-	United Nations Development Programme.
UNEP-EAP	-	United Nations Environmental Program-Environmental Assessement Program (was UNEP-GRID)
UNEP	-	United Nations Environmental Program
UNIDO	-	United Nations Industrial Development Organisation.
USAID	-	United States Agency for International Development.
USGS	-	United States Geological Survey.
WSSI	-	World Seismic Safety Initiative, IAEE.

EXECUTIVE SUMMARY

Asia is the most disaster-prone region in the world, with almost 60 percent of all the world's natural disasters. In the last 30 years in this region, 1.2 million people have died, another 1.7 billion have been injured or lost their homes and livelihoods. Damage to infrastructure and investments has been extremely high. It has been demonstrated in industrialized countries that disaster resistant buildings and infrastructure can dramatically reduce the effects of disasters.

The Asia Urban Disaster Mitigation Project is designed to introduce these technologies to targeted countries in Asia. The Project is planned for a three year period, with a total cost of $4.3 million, of which $3.8 million would be USAID/OFDA grant funded.

Project Components

1. Demonstration projects

Five cities have been identified for potential demonstration projects. In India, Indonesia, Sri Lanka, and the Philippines, hazard mapping and vulnerability assessments will be carried out in targeted cities to identify "high risk" areas or types of structures. In Nepal, a broader, more regional analysis of three municipalities in Kathmandu Valley will be carried out to develop disaster scenarios.

Some of these assessments will focus on earthquakes and others on flooding or landslides and each will result in recommendations for instituting mitigation measures. These measures could be related to better zoning and enforcement of building codes so that the type and standard of construction is appropriate to the vulnerability of the area. In some target cities, intensive assessments could focus on lifeline networks, such as power, telecommunications, transportation and water systems, or on critical facilities such as hospitals, health centers, and schools which must remain functional after a disaster.

2. Information Dissemination and Networking

The Project's success will be measured, in part, by increasing the ability of institutions to replicate demonstration projects. As many national institutions, individuals, and training organizations as can reasonably be involved will be linked through information sharing, training and consultation. National disaster mitigation committees will be established in each country. The Project will support the networks's efforts to disseminate mitigation information through various channels, including seminars, newsletters, and computer bulletin boards. Also, participating institutions will be asked to help to establish a baseline data on disasters and to collect detailed, medium term information on subsequent disasters.

3. Policy Seminars and Training

The Project will support both policy seminars and formal training of trainers. Policy seminars will be very focused and aimed at high level decision makers. They will be used for raising awareness and for gaining wide spread political support for the introduction of disaster preparedness and mitigation practices.

The Project will also support regional core "Train the Trainers" courses and in-country training. Trainers from each country will be trained in the core curriculum at regional workshops. These trainers will then initiate national training programs, adapting the curriculum, as necessary to the circumstances in each country. The four core courses will be a) Risk Management and Mitigation for Urban Professionals; Hazard, Vulnerability and Risk Assessment; c) Structural Hazard Mitigation for Earthquakes; and d) Structural Hazard Mitigation for Floods and Landslides.

Implementing Institutions

After surveying the five most likely institutions for implementing this Project, the Project design team concluded that the only one it could recommend is the Asian Disaster Preparedness Center (ADPC) at the Asian Institute for Technology (AIT). The Project is designed to be implemented through a USAID Cooperative Agreement with ADPC.

ADPC will develop criteria for selection, approval and funding of demonstration activities, identify one or two lead institutions in each country to be responsible for managing demonstration projects and in-country training, and provide sub-grants to selected institutions to implement these activities. It will use procedures which are consistent with USAID practices. ADPC will also form a cadre of training staff using ADPC full time staff and intermittent consultants which will be responsible for overseeing all training and policy seminar activities.

USAID Project Management

Project management, regular monitoring and evaluation will be the responsibility of the Regional Support Mission's Environment Office/RHUDO. A USDH will be assigned to this Project. The RSM's Office of Procurement will prepare and negotiate the grant agreement.

A USAID Project team is also proposed, comprised of representatives from each RHUDO in Asia (Bangkok, Jakarta, New Delhi), two representatives from OFDA, and the Senior Project Manager from ADPC. This committee would be convened once a year for key oversight activities. The USDH Project manager in RSM/RHUDO would convene the team meetings.

I. STATEMENT OF PROBLEM AND OPPORTUNITY, PROJECT PURPOSE AND ASSISTANCE INTERVENTIONS

A. Statement of Problem and Opportunity

Asia is the most disaster-prone region in the world, with almost 60 percent of all the world's natural disasters. In the last 30 years in this region, 1.2 million people have died and 1.7 billion have been injured or lost their homes and livelihoods due to natural disasters.

World-wide economic losses due to disasters are astronomical and have been doubling every decade. According to IDNDR (International Decade for Natural Disaster Reduction) figures, 1992 losses were $62 billion, the first time they have exceeded the total for international development assistance. The World Bank and the U.S. Geological Survey (USGS) estimate that in all developing countries "...a $40 billion investment in prevention, preparedness and mitigation would reduce projected losses by $280 billion". Currently, economic losses in low income countries are 20 to 30 times higher than in the developed world.

Earthquake and cyclone resistant buildings and infrastructure and flood protection projects have dramatically reduced the effects of disasters in terms of loss of life and property damage in industrialized countries. In developing countries, as yet little consideration is being given to mitigation for natural hazards. Some of the constraints and difficulties developing countries face include:

- lack of national and regional champions for mitigation activities due to lack of awareness or political will;
- limited access to technology and tools to identify hazard-prone areas;
- lack of expertise on methods used by practitioners in industrialized countries to prepare for disasters once hazard prone areas are identified;
- unsafe locations and construction of the existing built environment;
- inadequate technology transfer and institutional development for on-going disaster mitigation and preparedness; and
- inadequate participation of the non-governmental sectors in the mitigation process and lack of collaboration among public, private and non-government sectors.

Many developing Asian countries are experiencing extraordinarily

high rates of industrialization and economic growth with much of their population growth and capital investment concentrated in fast-growing urban areas. The size and economic importance of cities in Asia create an exposure to risk from natural disaster, while at the same time creating the wealth which provides the means to address vulnerabilities through disaster mitigation strategies. Appropriate planning and investing can greatly reduce the effects of natural disasters on urban residents and economic activity.

B. Project Goal and Purpose

The *goal* of the Project is to establish sustainable public and private sector mechanisms for disaster mitigation that will measurably lessen loss of life, reduce the amount of physical and economic damage, and shorten the length of time involved in recovery from natural disasters.

The *purposes* of the Project are to:

(1) reduce the natural disaster vulnerability of urban populations, infrastructure, lifeline facilities and shelter in targeted cities in Asia; and

(2) promote replication and adaptation of successful mitigation measures within the countries where demonstration projects are carried out and in the region.

C. Project Strategy

The Project will use demonstration projects which address specific constraints as a focus for activities in each participating country. Demonstration activities will show specific and realistic ways to reduce the impact of natural hazards on residents and economies of targeted urban areas, but the replication of the lessons learned will be the true test of the Project's impact. Demonstration activities should, therefore, be regarded as one of the means through which the Project will accomplish its larger task of facilitating institutional, behavioral and policy changes on a national and regional scale.

For Project implementation, one to two key institutions will be identified in each country. These institutions will be the main counterparts for overseeing demonstration projects, policy change and skills training, and information dissemination throughout the target country. Lead national institutions in each country must be able to manage demonstration projects, have access to national policy makers, planners and managers in other cities within the country, and be able to continue training in mitigation after Project support is concluded. A larger network of national and regional institutions will be identified during the Life of Project to help lead institutions in the dissemination of information, lobbying, and training.

The Project will accomplish its objectives by:

- assisting countries to define priority problems and identify measures to address them;
- supporting practical demonstrations of how to better prepare for and mitigate the effects of natural hazards;
- developing and institutionalizing training programs to increase the number of professionals with disaster mitigation skills;
- assisting in dissemination of successful experiences and information; and
- promoting appropriate national disaster mitigation policies and strategies.

The Project will support the establishment of a regional framework for training, collaboration, support and information exchange in the field of disaster mitigation. A regional approach is needed to ensure quality control of training, and to share experiences and comparable data/information across countries.

The models developed by this Project are expected to be sustained and expanded after this Project ends. While the focus of this Project is on countries in Asia where USAID currently has urban programs, other donors like ADB and UNDP have expressed interest in supporting disaster mitigation activities in countries in Asia, possible in conjunction with this Project. Efforts will be made to increase the amount and diversify the sources of funding for these activities.

D. Assistance Interventions

The Project will use technical assistance and demonstration projects, information dissemination and networking, and training (including policy seminars) to overcome constraints and accomplish its objectives. These components are described more fully below.

D.1. National Demonstration Projects

Five potential demonstration projects have been identified in collaboration with the USAID Missions and RHUDOs in the region. In four countries--India, Indonesia, Sri Lanka, and the Philippines--hazard mapping and vulnerability assessments will be carried out in targeted cities and specific mitigation measures will stem from those assessments. In the fifth country, Nepal, a broader, more regional analysis of three municipalities in Kathmandu Valley will be carried out to develop disaster scenarios. These, in turn, will result in recommendations for a comprehensive set of mitigation measures and an institutional structure to implement the measures.

A team of consultants, USAID staff, and a wide range of public and private individuals helped to identify cities for potential demonstration projects, some initial problems and constraints in those cities, and potential institutions for managing demonstration projects and training in each of the five countries. These project concepts are outlined in Table 1 (following pages) and described in more detail in Annexes to this Project Paper. Proposals will be sharpened and refined before projects are approved. (See Section II.A.2 on Project Implementer's Responsibilities.)

The kinds of activities which will be supported in demonstration projects are described below.

D.1.a. Hazard, Vulnerability and Risk Assessment of Urban Areas

Hazard mapping and vulnerability assessments are the principal methods used for identifying the potential effects of disasters and for developing mitigation strategies. Hazard maps are created by overlaying the frequency and severity of natural disasters on a geographic grid. Mapping for demonstration projects will be done on a city-wide basis. GIS technology, an important new technical tool for mapping, will be used in demonstration projects and training.

The degree of vulnerability of particular areas of a city or types of structures is determined after correlating the incidence of the hazard with underlying land uses. Once defined as "high risk", an area or type of structures can be examined more closely to determine what measures could be taken to reduce vulnerability. Usually more than one option is identified and cost-benefit analyses can be carried out on different mitigation strategies.

The frequency and severity of hazards will affect assessments and strategies, as will the type of natural disaster. Hazard maps and assessments will vary for floods, earthquakes, landslides and other natural disasters. Earthquakes in the Philippines and Indonesia, like many other Asian countries, often result in widespread destruction due to liquefaction and ground shaking which is related to specific localized soil conditions. In such

Table 1
Summary of Potential National Demonstration Projects

Location	Dis	Institutions	Activities	Outcomes
India Visakhapatna or Ahmedabad	 CY FL or FF FL	**CEPT**	Prepare municipal hazard maps, assess vulnerability of basic infrastructure and critical public facilities; integrate with environmental hazard mapping Identify cost effective mitigation measures and resources to implement them Training and policy workshops to promote adoption, replication of public, private sector mitigation methods particularly in low-income residential areas, schools, and small businesses ; initiate public-private sector collaboration mechanism for mitigation activities	GIS mapped environmental information integrated with hazard and vulnerability data adopted by targeted city, private and community groups for improved city planning and long term mitigation efforts Other cities and states aware of, interested in replicating vulnerability assessment methods and mitigation practices Permanent training mechanisms exist for interested cities, states, community groups and NGO's to learn vulnerability assessment and mitigation practices
	all	ADPC	Evaluate building center concept; develop regional replication program	Possible replication in Asia to improve informal housing building practices
	all	DMI	Create network of NGOs active in community based mitigation in India	Public sector and NGO collaboration on disaster mitigation for more effective resource use and coordination
Indonesia Bandung	**EQ** FL LS	**ITS**	Prepare municipal hazard maps, assess vulnerability of basic infrastructure and critical facilities (especially schools) Identify cost effective mitigation measures along with institutional framework and funding sources to implement them; demonstrate replicable school retrofit, design and construction process Technical assistance to design detailed national policy, procedure and funding mechanisms to transfer demonstrated mitigation methods to all municipalities Training and policy workshops to support adoption, replication of public, private sector mitigation methods	Hazard and vulnerability assessments for target city used to identify and design projects to reduce potential capital losses and improved post disaster recovery Process and program developed to reduce nationwide vulnerability of new and existing schools to earthquakes Disaster mitigation process introduced to municipalities through new detailed national mitigation policy and process Permanent training mechanisms for interested cities, provinces and community groups to learn vulnerability assessment and mitigation practices

Legend: CY- Cyclone, EQ - Earthquake, FL - Flood, FL - Flash Flood, LS - Landslide

Table 1 (cont.)
Summary of Potential National Demonstration Projects

Location	Dis	Institutions	Activities	Outcomes
Nepal Kathmandu Valley	EQ	**NSET** **NASC**	Develop an earthquake scenario to identify major urban lifeline, critical facility and institutional vulnerabilities in Kathmandu Valley municipalities Conduct awareness raising workshops for public and private sector Define prioritized range of non-structural and structural mitigation measures, funding mechanisms and related institutional implementation plan Design process to establish institutional structure that will advocate, implement long term mitigation measures	Comprehensive earthquake mitigation program for Kathmandu Valley that will be a model for other municipalities in Nepal Establishment of a permanent disaster mitigation council of government, business and industry leaders Strengthened institutional capacity to enforce design construction and maintenance standards; strengthened commitment to construction quality Model earthquake scenario process that is transferable to other Asian cities
Philippines Davao and General Santos	EQ FF	**PHIVOLCS** **UP/LGA**	Prepare municipal earthquake, flood hazard and vulnerability assessments; prepare provincial study of power supply system vulnerability Publish site selection materials for private investors to select less vulnerable sites Develop Barangay flood, earthquake community preparedness plans Training and policy workshops to promote demonstrated mitigation processes with other cities with similar vulnerabilities; promote national policy that provides incentives to adopt mitigation practice	City wide land use and community preparedness plans reflect of flood and earthquake risk assessments; assessment and mitigation techniques used by city, community and commercial groups to evaluate development and investment plans Adoption and replication of demonstrated assessment and mitigation techniques by other cities Development of national mitigation policy that promotes mitigation at city and community levels Permanent training mechanisms for interested municipalities and community groups to learn demonstrated vulnerability assessment and mitigation practices
Sri Lanka Kandy and Colombo Districts	FL LS	**CEA** **NBRO**	Develop low cost water flow and water quality monitoring systems, and produce risk and vulnerability assessment management system for the Kelani River Catchment Basin Develop appropriate, low cost landslide monitoring systems for ground stability, reintroduce low cost community based mitigation techniques in districts with landslide hazard zones Construct demonstration of monitoring system and landslide mitigation techniques	Institutional mechanism to coordinate, monitor and manage entire catchment area and landslide zones; improved national and local management capability Monitoring system to manage flood and pollution hazards and reduce vulnerability Increased community based capability to reduce incidence of land instability disasters through early warning monitoring systems

Legend: CY- Cyclone, EQ - Earthquake, FL - Flood, FL - Flash Flood, LS - Landslide

countries, it is important for the mapping and assessments to evaluate underlying soil characteristics and correlate them with land uses. Several target cities will have demonstration projects focused on earthquakes.

Floods are an annual feature of life in many Asian countries. Environmental degradation is exacerbating flood damage in many places. Floods result in direct economic loss, structural damage and loss of life. They may also cause important secondary environmental effects, such as negative health effects through the dispersion of toxic pollutants. Landslides, another rainfall induced hazard, are also a chronic problem in many countries throughout Asia. Some countries, such as Sri Lanka, have begun work in this area, by preparing scientific landslide hazard maps. However, these maps are still not understood by or accessible to development decision makers. A demonstration project for hazard maps and assessments related to flooding and landslides would be useful in Sri Lanka as well as several other countries.

The Project will aim to impart an understanding of and the ability to use these tools in each participating country. Mapping and assessments of areas prone to natural hazards such as earthquakes, flooding, and landslides will be carried out to demonstrate various GIS applications, the issues and problems related to each particular hazard, and the range of options for addressing those problems.

The data produced by these exercises is essential information for policy-makers and planners, developers and builders, investors and insurers, and business and residents in disaster-prone areas. They need to know the impacts disasters can have on the existing built environment, the costs to reduce those effects, the best locations for future urban expansion, and the services and lifeline facilities they can count on after a disaster.

D.1.b. Identification and Implementation of Mitigation Strategies for Safer Urban Areas

Each of the demonstration projects will identify strategies to make the city a safer place. In many cases, these will be better zoning with the type and standard of construction related to the vulnerability of areas. Many zones are inappropriate for any construction; efforts may be needed to strengthen enforcement to prevent squatters from taking up residence, or other development.

For areas approved for development, construction may not meet code. Along with better inspection and enforcement of building standards, it may also be possible to link safety standards in buildings with the availability of insurance, thus providing incentives for safer construction.

D.1.c. Identification and Implementation of Mitigation Measures for Lifelines (Infrastructure)

Depending on initial vulnerability and risk assessments, more intensive assessments could be done in some target cities. These intensive assessments would focus on lifeline networks, such as power, telecommunications, transportation, water and sanitation systems.

It is more likely that this specialized assessment will be carried out if there has been a failure in a particular system in the past or if there is existing concern about it. For example, the target city of Davao is one of several special economic growth centers in the Philippines. Power supply is one system which is vital to the economic activity of the city and there is concern about its vulnerability to natural disaster. If this vulnerability is confirmed, the cost effectiveness of retrofitting would be examined. One rough calculation is that loss of power would result in the loss of the equivalent of six million pesos per day (about $250,000) in income and productivity. Such loss, and the likelihood of it happening, would need to be weighed against the cost of reducing risk.

Efforts will also be made to look at how grassroots communities can participate in maintaining lifeline networks in target cities. For example, landslides frequently cause transportation blockages, housing damage, injuries and deaths. Community-based, low-cost measures can help reduce the vulnerability of roads by improving drainage, slope stabilization and retainage.

D.1.d. Identification and Implementation of Mitigation Measures for Critical Facilities

In some target cities, special attention will be paid to the structural vulnerability of critical facilities such as hospitals, health centers, schools, churches, mosques, police stations, fire stations, and community centers which must remain functional after a disaster. Vulnerability assessment of individual structures (risk audits) will look at a specific number of these buildings to determine how they will be impacted by disasters and what mitigation or retrofitting could be done.

For example, in recent Indonesian earthquakes, school buildings have been shown to be particularly vulnerable, resulting in danger to students as well as potential financial losses from structural damage. Mitigation measures may include both retrofitting programs, a program focused on earthquake-resistant design and construction of all new schools, national-level policy changes as well as community-level programs to make neighborhoods

and families aware of potential dangers and what can be done to mitigate them.

Methodologies for such structural assessments exist in industrialized countries. However, since construction standards and techniques may differ from Asian countries, methods may need to be adapted to local circumstances and local language manuals prepared. These projects will also demonstrate retrofitting techniques, if funding permits.

The city-wide vulnerability assessments will evaluate standards for high rise and mid-rise construction as a matter of course. However, in some cases, special attention will be paid to low income neighborhoods, which are usually built in large part by residents. Many Asian countries have a large proportion of what are called "non-engineered structures" and this part of the residential stock represents a significant vulnerability. Numerous techniques for strengthening informal housing exist, some of which were practiced locally in the past but discarded for various reasons. One demonstration project may propose to introduce or reintroduce simple strengthening measures appropriate to the local house types, and working with community leaders to disseminate better building techniques.

D.1.e. Regional Disaster Scenarios

One proposed pilot project for the Kathmandu Valley in Nepal, may use a "disaster scenario" approach to assess the points of greatest vulnerability in urban systems and prioritize those vulnerabilities through benefit-cost analyses that consider costs in the aftermath of disaster with and without the introduction of appropriate mitigation elements. Such as an assessment would illustrate a) the broad-based implications of disasters for several municipalities in one area, and b) the value of public/private cooperation and commitment to reduce the risk. Exposure to building damage, infrastructure damage and interruption of essential utilities would be defined. Demand for critical response services would also be forecast based on projected search-and-rescue, emergency medical and other services. These projections would be developed jointly by multi-disciplinary teams of local representatives from the public and private sectors, assisted where needed by international experts. The multi-disciplinary teams, would include but not be limited to specialists from the fields of government, business and industry, city planning, community development, urban infrastructure and emergency services.

A comprehensive set of earthquake risk reduction measures including mitigation and preparedness strategies would then be defined. Planned development projects would be looked at to see

how resources available for priority vulnerability reduction measures could be financed. The assessments and analysis from the project would then be used by municipal governments, ministries and development agencies to adjust present projects and design future projects. The final component of the scenario would be to define and establish the institutional structure needed over the long term to implement the recommendations on a sustained basis.

D.2. Information Dissemination and Networking

A large part of the success of this Project will be measured by the ability to replicate the demonstration projects in other parts of the country where they were carried out, and in the region. While lead institutions will be selected for overseeing the demonstration projects and for training, as many other national institutions, individuals, and training organizations as can reasonably be involved will be linked through information sharing, training and consultation. It is hoped that some of these organizations will become coalitions or advocacy groups to lobby for changes in safety standards for construction and lifeline facilities.

National disaster mitigation committees will be established in each country. Members will include collaborating institutions, individuals and organizations from public, private and NGO sectors. The Project will support efforts of national networks to disseminate information about demonstration projects and disaster mitigation policies. These will also be the principal audiences of national policy seminars (see Section D.3.a. below) and regular information exchanges, through newsletters, and computer bulletin boards.

Institutions implementing demonstration projects will be asked to track the impacts of those projects on the communities and people involved. Institutions which are involved in national networks will be asked to help to establish a baseline and to gather better data on natural disasters and their effects on a national level. Participating national institutions will be requested to collect detailed information on the impact of disasters soon after they happen, and to identify preparedness and mitigation measures which could help prevent future problems.

Currently, a great deal of technical information is gathered on specific disasters, e.g., soil conditions in seismic zones, volcanic ash fall, rainfall, wind speeds, and damage statistics. There is much less effort made to collect data on the socio-economic impacts of disasters. It is often difficult to say how specific infrastructure was damaged; how that damage affected low income groups, women and children; whether the effects were

financial or involved health; and the kinds and length of impacts on financial markets, local traders and businesses. This kind of information is critical to professionals who are looking at the options for mitigation. This rich data base provides the basis for exchanging information between countries and will allow a regional assessment of the impacts of mitigation efforts on the victims of disasters.

Along with data gaps, there is a shortage of audio-visual materials relating to disasters and especially to mitigation. The Project will support the development of audio-visual materials on disaster mitigation for countries to use in their public awareness programs for preparedness and mitigation. The demonstration projects will provide inputs for these materials which can also be used in the training programs.

D.3. Policy Seminars and Training

The Project will support regional and national policy seminars, formal training of trainers, and training of development professionals involved in national projects.

D.3.a. Policy Seminars

Policy seminars will be very focused, short-term, and aimed at high level decision makers. They will be used primarily for raising awareness and for gaining wide spread political support for the introduction of disaster preparedness and mitigation into building standards and practices.

National seminars will be held periodically for a broad range of urban professionals and policy-makers to provide an overview of disaster management and mitigation considerations in the urban development process. These seminars will emphasize hazard, vulnerability and risk assessments, risk management, mitigation policy issues, land use planning, and incorporation of mitigation in infrastructure development. Local examples will be used, derived from the demonstration projects.

Finally, the Project will support two meetings for a larger group of donors and country representatives to promote greater awareness of disaster mitigation issues and programs, and greater cooperation among donors in this area. These meetings could be characterized as both policy seminars and networking. Key decision makers and representatives of donor agencies will be asked to participate in these meetings. The principal purpose of the meetings would be to recommend strategies for raising regional awareness of preparedness and mitigation measures and to facilitate regional exchange and replicability of demonstrated approaches and methodologies. If a sustainable body of regional

policy makers can be constituted, ADPC would continue after the USAID Project is completed to serve as this group's technical arm, providing it with technical reports and policy papers, and access to its networks.

D.3.b. Training

A number of training courses are conducted in Asia on various themes pertaining to disasters. They are often of short duration and too general. Most focus on response, relief and rehabilitation in post-disaster scenarios. With the exception of training carried out by the Asia Disaster Preparedness Center (ADPC), little effort has been made to develop training on disaster preparedness, prevention and mitigation.

Training activities for this Project are designed to:

- Develop a standardized regional training curriculum for hazard mitigation.
- Equip institutions with the skills and knowledge needed to effectively assess issues and develop disaster mitigation strategies in the communities where demonstration projects are carried out.
- Strengthen the capacity of participating countries to organize and conduct disaster mitigation training on a national basis.
- Integrate hazard mitigation topics into the syllabus and programs of selected universities and other training institutions.
- Provide opportunities for dissemination and exchange of information, techniques, methodologies and initiatives to reduce the negative impact of disasters.

The training component of the Project consists of two components which are closely related: regional core "Train the Trainers" courses, and in-country training.

(1) Regional Training of Trainers

The Project will support the development of a core disaster mitigation curriculum and the training of trainers from each participating country in this curriculum. In each country, the trainers will adapt the curriculum to local circumstances, train individuals who will carry out demonstration projects, and initiate an on-going, hopefully national, series of training

programs.

The curriculum will be developed as practical, hands-on workshops, with rigorous academic underpinnings. Instructional materials will be developed, including training manuals, audio-visual materials, GIS computer program instruction, and hand-outs for students. These materials will be translated and adapted, as necessary for each of the countries. The training will equip project implementors and participants with the necessary knowledge and skills to assess problems and develop solutions. It is expected that additional materials will come out of the demonstration projects which will be useful for on-going training programs. For example, case studies on hazard mapping and vulnerability assessment, examples of simple, low-cost methods for assessing and improving housing and infrastructure, or technical papers on solutions for specific hazards.

The lead training institution may be either a university or a professional training institute. If it is a university, efforts will be made for the curriculum to be approved for accreditation, with the possibility of being included in degree programs. This will create a broader demand for the training, provide a "stake" in its development by academic institutions, and, therefore, a greater supply of potential providers for training. If, however, there are national training institutions which are more appropriate for on-going disaster mitigation training, these institutions will be used instead.

Four core courses have been identified:

- Risk Management and Mitigation for Urban Professionals: This course, designed for a broad range of urban professionals and decision-makers, will provide participants with an overview of all disaster mitigation considerations in the urban development process such as hazard, vulnerability and risk assessments, risk management, risk audits, policy issues, land use planning considerations, the role of insurance, as well as general disaster management and preparedness planning. This course will be designed to be conducted in its entirety or in modules, tailored to a wide target audience. It will also be promoted as a course that can be adapted and integrated into the programs of disaster management training and development assistance agencies.

- Hazard, Vulnerability and Risk Assessment: This more technical course for planners and engineers will teach participants the skills required to do detailed hazard and vulnerability assessments and risk management for

urban areas or urban investment projects. From the assessment, the participants will learn to identify appropriate, cost-effective mitigation strategies.

- Structural Hazard Mitigation for Earthquakes and

- Structural Hazard Mitigation for Floods and Landslides: These courses will provide continuing education to engineers, architects and builders, giving the skills required to assess the vulnerability of existing structures (risk audits) and then identify cost-effective structural changes to improve their resistance to hazard events. One will focus on flooding and landslide vulnerability reduction and the other on earthquakes. Although focusing on engineering and cost-benefit analysis, significant attention will also be given to systemic elements (non-structural) that must be considered such as enforcement of prevailing building codes, standards of design and construction practices. Both engineered and non-engineered structures will be considered.

In the first six months of the Project, intensive work will be done on curriculum development and on identifying the training institutions and trainers to be trained. Each course will be given regionally in the training of trainers mode, with participants from all of the countries. Upon return to their countries, trainers will conduct the same courses in-country, for personnel for demonstration projects, and be adapted for national training programs.

(2) In-Country Training

Two types of courses will be supported by the Project. First, in-country training using the core curriculum will be carried out with participants from the target cities (people who will work on demonstration projects) and others. In addition, ad hoc or special courses will be developed in conjunction with the demonstration projects, responding to specific national issues not covered by the core regional courses.

The Project will seek to identify other training agencies and institutions in each country that may not be directly involved in project activities, but are willing to include disaster mitigation topics in their programs. These will be the target audience of the principal training institution. To the extent possible, these agencies will be identified at the start of the project.

Technical assistance will be made available by ADPC to these

agencies and institutions, as needed, to support them in developing the training. In addition to training of trainers, specific assistance may include: seed funds to develop curriculum and materials, and consultants to provide technical inputs or serve as resources in training events.

II. PLAN OF ACTION

A. Project Implementing Institutions

The Project will be implemented by the Asian Disaster Preparedness Center (ADPC) at the Asian Institute for Technology (AIT), under a USAID Cooperative Agreement. ADPC will identify lead institutions in each country to be responsible for managing demonstration projects and in-country training. Sub-grants will be made, as appropriate, to these institutions by ADPC. The criteria for selecting national institutions are in Annex I.

A.1. The Choice of ADPC as Project Implementor and Grantee

During the planning phase of this Project, OFDA requested that the design team look at alternatives to ADPC for implementing this Project. Criteria or characteristics were identified that would be important for any institution given this responsibility. Four possible alternatives to ADPC were identified: the Asian Development Bank (ADB), UNEP/HABITAT's Asia Regional Program managed from Bangkok, the Asia and Pacific Development Center (APDC) in Kuala Lumpur, and the International Center for Integrated Mountain Development (ICIMOD) in Kathmandu.

Based on the criteria and assessments of each of these institutions, none were considered viable alternatives to ADPC. Of all of the alternatives, ADB was the most indicated from a managerial viewpoint, but it would not assume the role of Project implementor, strongly recommending ADPC for this role. A more detailed discussion of the pro's and con's of each institution, and the reasons why ADPC is the <u>only</u> institution recommended to implement this Project are found in Annex H.

While ADPC has a commitment to disaster management issues, ten valuable years of experience, and a lot of regard from its constituency in the region, it is still going through growing pains. An ADB assessment was funded last year to look at the Center's activities, sources of funding and management practices. This assessment culminated in a seminar held in October 1994 on the future of ADPC called "Policy and Institutional Requirements for Disaster Mitigation in Asia and the Pacific". It was well

attended by ADPC client organizations and donors. The most fundamental issues discussed were how to make the relationship between ADPC and AIT work more smoothly (related, in part, to better management and improved cash flow), and how to expand "ownership" of ADPC so that governments in the region will provide additional support and guidance.

Annex G provides background on ADPC, as well as a description of the many steps being taken to reorganize and improve ADPC's internal management structure and operating procedures. For example, ADPC is looking for ways to more fully integrate its operations with the university community, both internally at AIT and externally with key universities in each country where it operates. One of the Center's sections, Technical Services and Academic Programs, has the responsibility of looking into long-distance learning and accreditation for disaster related courses. Another important initiative is the establishment of national disaster mitigation centers modeled on AIT/ADPC. This would institutionalize and greatly expand many of ADPC's initiatives.

A.2. Project Implementer's Responsibilities

As Project implementer, ADPC will be responsible for the following activities:

(1) Developing criteria for selection, approval and funding of demonstration activities.

Annex I provides the draft guidelines for project selection and approval. These guidelines will be sent to each of the institutions which have proposed projects, and other institutions which RHUDOs and ADPC believe might be able to develop good demonstration projects or training programs. The detailed proposal which will be prepared by national institutions will be used to determine what levels of funding will be provided for demonstration projects.

(2) Providing sub-grants to selected institutions to implement demonstration activities, management oversight, and accountability for project funds.

Once demonstration projects have been approved, ADPC will work with the national institutions or sub-grantees on a work plan, including a disbursement plan. ADPC will also make arrangements for training to be provided to staff involved in the demonstration projects. Once a work plan is prepared, ADPC will provide an advance as working capital to begin mapping and assessment of the city. The advance will be a rolling advance, i.e., disbursements will be made against project expenditures and liquidated in the last three months of the activity.

The grants provided to lead institutions in each country may include support for staff within those countries. While country contributions will be required for every project, it may be necessary for a given period of time to hire a local project coordinator if participating institutions cannot provide a full-time person.

ADPC will oversee the grants for each demonstration project. They will use procedures for disbursements and accountability consistent with USAID practices, and will be accountable to USAID for funds passed to other organizations. ADPC will also ensure that contracting of technical experts to assist in training and other aspects of the Project are consistent with U.S. government practices. Finally, ADPC will make all of the arrangements for policy seminars and training programs, including travel of participants as appropriate.

(3) Designing core curriculum, selecting in-country training institutions, conducting training of trainers, special project-related training and facilitating policy seminars.

ADPC will form a cadre of training staff using ADPC full-time staff and intermittent consultants. This cadre will be responsible for overseeing all aspects of the training component. During the first six months of the Project, the training staff will design core curriculum, including training materials, and carry out regional training of trainers courses at ADPC. The training of trainers courses will be aimed at staff from the lead training institutions in each of the countries which will carry out demonstration projects. ADPC will develop MOUs with these institutions with regard to subsequent training which they will carry out on a fee basis.

ADPC will also oversee the first core courses delivered in each country, ensuring that participants include the staff who will participate in demonstration projects, as well as trainers from other institutions.

Policy seminars, to be carried out during the Project at the national level, and two at the regional level, will be fully coordinated with other technical staff and the USAID team. These seminars will be aimed at top level decision makers and institutions which can replicate mitigation activities.

(4) Regional data compilation on disasters, mitigation strategies and preparation of reports and audio-visual materials

ADPC has an extensive library and growing data bank on disasters in Asia. The Project will provide some support to this section

in order to develop better data and documentation related to mitigation of disasters.

A.3. ADPC Project Staff and other ADPC Support

The Project will support the following staff:

Full Time:	Senior Project Manager and Secretary.
Part Time:	Information Specialist/Editor (65%)
	Mitigation/GIS Analyst (35%)
	Finance/Administrative Support person (50%)

Current and future staffing patterns of ADPC, which include but are not limited to staff funded under this Project, are provided in Annex G.

The Senior Project Manager, an international hire located in the Urban Mitigation Section, will develop national pilot projects, manage inputs and short term staff, market training programs, develop sources of support from other donors and Missions, and coordinate network activities. The Senior Project Manager will develop MOUs with local institutions and donors on cost sharing for specific Project activities, and be responsible for identifying short-term experts for different components. The Senior Project Manager will be a professional in the field of urban disaster preparedness and mitigation with excellent managerial skills and experience in managing complex projects.

The Information Specialist/Editor, a regional hire, will set up, develop and maintain the regional data base, maintain a contact list of project network members, and set up a desk top publishing operation for reports, manuals, and other publications done for the Project. The Information Specialist/Editor will assist the Senior Project Manager in designing and carrying out the Project dissemination plan. He or she will be experienced in information collection, institutional networking, desk top publishing and computerized communication systems (such as Internet) and other communication networks.

The Mitigation/GIS Analyst, a regional hire, will provide basic technical research and GIS mapping support to staff and short term technical specialists in support of national projects, training and information programs.

The Finance Administrative Support person, a regional hire, will provide financial, contractual and administrative support to the Senior Project Manager and other professionals working under the Project. The Finance Administrative Support person will have knowledge of bookkeeping procedures, cost center management, project tracking and reporting procedures and contract

administration. ADPC's Finance and Administrative Support section will provide important support to this team member.

In addition, the ADPC Training Section will play a pivotal role in the Project. Training inputs for the project will be provided on an ad hoc basis, with project funding based on the staff time used for those activities, such as the development of core training curricula, to carry out specific Training of Trainers programs, and to prepare training materials, manuals and reports. The ADPC Training section will also help to facilitate the initial in-country courses on the core curricula and the policy seminars, as appropriate. A training plan will be developed and used as the basis for providing all training inputs required from ADPC staff.

ADPC's Consultancies Management Section will manage the contracting of short term, specialized technical assistance support required by the Project for national programs. A pre-agreed list of experts will be developed and used as the basis for the provision of these services.

In addition, it is expected that ADPC will provide many other kinds of contributions. For example, ADPC's Information and Economic Research Sections will provide support to the project in the coordination, collection, analysis and dissemination of project related information that will also be critically important inputs to the project monitoring process. Up to 20 percent of the output of this section is expected to be directly relevant to the mitigation Project.

One of the most important contributions ADPC may make in the area of disaster mitigation is the Center's commitment to replicate itself at a national level in each country where it works. While this is a long-term objective, ADPC is committed to helping to create National Disaster Preparedness Centers to carry on work started by ADPC. Also, it is expected that ADPC will carry the activities initiated under this Project to many more countries in the region. It will also help to institutionalize mitigation by making it a more formal part of the academic curriculum in many countries, and provide support for the development of National Disaster Management Centers in participating countries. This last, most important, initiative is likely to be tied to the identification of lead institutions and initial demonstration projects.

B. USAID Project Management Activities

B.1. RSM/RHUDO Project Management

Project management, regular monitoring and evaluation will be the

responsibility of the Regional Support Mission's Environment Office/RHUDO. A USDH will be assigned to this Project. The RSM's Office of Procurement will be responsible for preparing and negotiation the grant agreement.

Once the Project is approved, USAID will require a **Project Work Plan** from ADPC which includes:

> **(1) An updated Timetable and cost estimates for Year 1 activities.** This update would include estimates for contracting short-term experts to assist in curriculum development and refinement of demonstration projects and procurement of staff at ADPC. It would also include an estimated schedule for training courses and submission and approval of proposals for demonstration projects.
>
> **(2) A description of AIT/ADPC's financial tracking system for sub-grants.** This part of the work plan would describe how sub-grants to national institutions will be tracked and accounted for. This information will be compiled in consultation with RSM's O/FIN to ensure that proper accounting is in place.

RSM/RHUDO will also be responsible for carrying out two Project evaluations. The budget ($80,000) is included in the cost of the Project. These evaluations, along with regular monitoring, will be used to make decisions on Project adjustments.

B.2. USAID Project Team

A USAID Project team will provide guidance for the Project. This Project team would be composed of representatives from each RHUDO in Asia (Bangkok, Jakarta, New Delhi), two representatives from OFDA, and the Senior Project Manager from ADPC. This committee would be convened once a year for key oversight activities. The USDH Project manager in RSM/RHUDO would convene the team meetings.

The Project Team would provide guidance on important programming issues, make adjustments in the Project if it appears warranted as experience is gained, and participate in the evaluation of the Project. Some of the team's agenda could include:

- Review guidelines for project selection, determine key conditions of the projects (such as the maximum grant sizes for types of activities in each country), and provide inputs for other components;

- Review progress on training of trainers and demonstration projects and review other issues arising

from Project implementation; and

- Review impacts of demonstration projects and regionalization efforts.

C. Project Timetable

The overall Asian Urban Disaster Mitigation Project funded by USAID will be completed in 3 years.

Each national demonstration activity will have its own timeline driven by project content and location, but on average these projects are expected to take 18 months. The mapping, assessment and strategies (the first part of each project) will take about 9 months and implementation of physical components will take about nine months. The start of projects will be staggered over the first two years of the Project.

Summary of Activities by Component	Year 1 FY 95/96				Year 2 FY 96/97				Year 3 FY 97/98			
	1	2	3	4	1	2	3	4	1	2	3	4
Project start up, cooperative grant agreements, etc.	=											
ADPC staff in place	=											
National Demonstration Projects & Training												
Guidelines/RFP's for demonstration projects sent out	=											
Proposals received		=										
Proposals reviewed		=										
Lead institutions selected		=										
Demonstration projects approved		=										
Demonstration project work plans finalized			=									
In-Country training work plans finalized			=									
Demonstration projects carried out			=	=	=	=	=	=	=	=	=	=
In-Country training carried out					=	=	=	=	=	=		
Visits, Study Tours, Tutorials and Fellowships						=	=	=	=	=	=	=
National Policy Workshops				=							=	
Regional Information and Network Support												
Information system and network established		=	=									
Information exchange			=	=	=	=	=	=	=	=	=	=
Collection/monitoring for project evaluation inputs	=	=	=	=	=	=	=	=	=	=	=	=
Publications, Disaster Reports and Films					=	=	=	=	=	=		
Disaster Economics Research and Support	=	=	=	=	=	=	=	=	=	=	=	=
Regional Training Support												
Core curriculum developed and refined	=	=	=					=				
Training of trainers (regional)				=					=			
Support to establish In-Country training programs					=	=	=	=	=	=	=	=
Regional Disaster Policy Workshops					=							=

Project Implementation (ADPC & LNI's)												
Management of demo. projects, training programs	=	=	=	=	=	=	=	=	=	=	=	=
Provision of technical assist., info., training inputs	=	=	=	=	=	=	=	=	=	=	=	=
Identify AUDMP project expansion opportunities	=	=	=	=	=	=	=	=	=	=	=	=
Coordinate AUDMP with other regional mitigation projects	=	=	=	=	=	=	=	=	=	=	=	=
Project Management and Evaluation (RHUDO)												
Project Steering Committee activities (RHUDO/OFDA)		=					=					=
Project oversight, grant agreements and management	=	=	=	=	=	=	=	=	=	=	=	=
Mid-term and final evaluations							=					=

III. DEFINITION OF SUCCESS

The regional Project is designed to support specific demonstration activities in five to six countries where a problem or constraint to vulnerability reduction has been identified and where resources can be targeted to achieve measurable results or improvements attributable to Project inputs. Each demonstration activity will be designed to stand alone and each, as it is proposed by local counterpart institutions, will have its own specific purpose, outcomes, indicators, critical assumptions, and realistic performance standards defined by activity staff. Each demonstration activity will also fit within the logical framework of the regional project so that, taken together, they represent a significant step forward in terms of improving the ability of individuals, governments, public and private institutions to reduce the impacts of natural hazard events in the region.

ADPC will ensure that contracts and MOUs specify responsibilities and contributions in order to establish a result-oriented working relationship with all its partners and collaborating institutions.

A. Intended Results

The Project will result in:

- improved public and private capacity to establish planning priorities and make informed decisions regarding siting or location of housing, critical facilities and infrastructure;

- improved public and private ability to access and utilize available technological data for risk management;

- new or strengthened mechanisms for cooperation and coordination of public, private and NGO mitigation efforts at both the national and regional levels;
- policy seminars and workshops to promote adoption and adaptation of mitigation strategies appropriate to the region and to specific countries;
- skills training and professional development courses institutionalized at both national and regional levels;
- improved information exchange/networking and increased knowledge of local, national and regional resources.

B. Indicators for Monitoring Project Level Progress

The *goal* of the Asian Urban Disaster Mitigation Project is to establish sustainable public and private sector mechanisms which will measurably lessen loss of life, reduce the potential for physical and economic damage, and shorten the disaster recovery period in the Asian region.

The overall goal is achievable only in the long term and success can only be realistically measured after future disaster events test Project outcomes. It is necessary to keep the goal firmly in view, however, as it states the Project's commitment and places value on long-term investment for safety in the built environment. Progress towards achieving the goal is contingent on communities, private organizations, investors and developers, insurers, educators, professionals and governments adopting and continuing to use mitigation and preparedness measures. Indicators for individual Project activities will be monitored to determine whether they become self-sustaining or are replicated outside the targeted communities, thus contributing to the long-term Project goal.

C. Criteria for Assessing Project Purpose Achievement

The *purposes* of the Project are 1) to reduce the vulnerability to natural disasters of urban residents, infrastructure, lifeline facilities, and shelter in at least five cities in targeted countries, and 2) to promote replication and adaptation of successful mitigation measures throughout the region.

Indicators for achievement of the Project purposes include:

- Increase in number of governments in the region adopting recommended mitigation practices and

procedures;

- Increase in number of private organizations, investors, insurers adopting recommended mitigation practices and procedures;

- Number of communities showing increased investment in appropriate vulnerability reduction and protection activities;

- Number of national and regional entities utilizing vulnerability assessment and risk audit procedures for site selection and facility design.

D. Monitoring

When proposals for specific demonstration activities are made, baseline data on existing conditions will be requested as part of the project activity description with a clear statement of expected results. The setting of realistic performance standards for the activity will be accomplished early in the activity design and initiation phases by local management staff (Lead National Institution and collaborating partners), with assistance from ADPC, so that they reflect country-specific opportunities and constraints, i.e., what is really achievable.

Monitoring of process indicators is part of the management responsibility of local coordinators. On a quarterly basis, they will be asked to report to ADPC on what has taken place with regard to the original program objectives and desired outcomes. ADPC will ensure that ongoing monitoring focuses on specific information needed to track key indicators so as not to overburden local staff but produces the information needed to evaluate progress.

The process of monitoring progress towards desired results and outcomes provides managers with the data needed to make informed decisions regarding adjustments in direction and allocation of resources. ADPC will use a "Managing for Results" approach to determine whether activities that do not progress will continue to be supported. Major revisions in support for demonstration activities or in regional strategy will be made by ADPC and lead national institutions in consultation with the USAID Project team.

IV. ANALYSIS OF FEASIBILITY, KEY ASSUMPTIONS AND RELATED RISKS

A. Key Assumptions

All of the countries in the region have initiated programs directed toward USAID Mission strategic objectives pertaining to economic growth, environmental protection and democracy building. The activities outlined in this Project are intended to enhance the countries' capacities and movement toward these objectives. More specifically Project activities are intended to result in reduced hazard incidence (flooding, pollution, landslides) and enhanced capacity to recognize and understand risks from earthquakes, cyclones, floods and landslides, thereby establishing a context for mitigation and vulnerability reduction. Additional key assumptions are that the Project, through strengthened educational support structures, can ensure that prevention and mitigation tools are disseminated, thereby resulting in strengthened institution capacity throughout the

region. Strengthened local capabilities are intended also to be a means of building responsive local democratic institutions (in addition to reducing vulnerability to hazards and strengthening environmental management practices).

An important outcome of the Project will be improved public and private sector commitment to risk reduction through increased capability for hazard management. This commitment will be exhibited through greater institutional capability for hazard analysis, capability to assess vulnerability and risk, and understanding of the opportunities and tools for mitigation. Institutionalization will be demonstrated through improved administrative practices, procedures, and regulations.

B. Related Risks

Key risks to the Project relate to underlying conditions in the countries. All of the countries in the region have adopted programs and plans to reduce the incidence of environmental disasters. All the countries have also undertaken varying levels of hazard specific risk assessment. Implementation of hazard reduction measures have been recommended in the context of such studies. Reasons for lack of implementation came up repeatedly in discussions and include:

Lack of accountability
Lack of coordination
Lack of enforcement and reluctance to enforce regulations
Lack of personnel, equipment, and financial resources
Lack of expertise
Overlapping institutional responsibilities

Risks to successful implementation and to achievement of sustained development impact will arise because of the foregoing issues. These issues will be taken into consideration in selecting lead institutions. To overcome these issues it will be necessary to undertake a range of activities directed to targeted "stakeholders". Although it is neither necessary nor feasible to make everyone a disaster mitigation expert, it is important that every opportunity be used to overcome implementation constraints in a manner consistent with the local culture.

C. Other Donor Programs

C.1. UNDP Programs

The United Nations has declared this decade the International Decade for Natural Disaster Reduction (IDNDR). The UN's objectives for the decade are 1) comprehensive national assessments of risks from natural hazards, and these assessments

taken into account in development plans, 2) mitigation plans at national and/or local levels involving long-term prevention, preparedness, mitigation and community awareness, and 3) ready access to global, regional, national and local warning systems and broad dissemination of warnings. IDNDR has resulted in increased attention to disaster management and mitigation programs worldwide and in the region.

UNDP and UN-DHA are almost finished implementing a regional and country Disaster Management Training Program (DMTP) in almost all countries in Asia. One output from this series of training programs is the identification of small national level, Disaster Mitigation Follow-On Projects in each country that received training. Each program is budgeted to receive $250,000.

C.2. Asian Development Bank (ADB) and World Bank

Once exclusively devoted to the rehabilitation of physical structures after disasters, ADB has begun to play an important role in disaster mitigation in Asia. One of its objectives is to integrate disaster reduction measures into all of ADB's lending activities in disaster-prone countries. This change in ADB policy took place when the UN declared the International Decade for Natural Disaster Reduction and when the extent of impact of disasters in the Asian-Pacific region on ADB's investments became clear. As an initial step in 1991, the ADB published Disaster Mitigation in Asia and the Pacific and the Disaster Management Handbook, which it contracted with ADPC to write. ADB is also looking to ADPC to provide regional and national level disaster mitigation technical assistance and training tied to their investment programs. ADB has funded a nine-month study team to identify the institutional development needs that will better enable ADPC to fill this role.

The World Bank also recognizes disaster mitigation as an important part of the development investment process and has supported a series of international workshops and conferences on various aspects of the topic. Some of the Bank's investment programs in Asia now have mitigation components, and this trend is continuing.

C.3. Others

The European Economic Community (EEC) and Japan International Cooperation Agency (JICA) have both been strong supporters of recent and on-going disaster preparedness and mitigation training programs in the region. The EEC supported a series of eight regional and sub-regional workshops called "Improving Cyclone Warning, Response and Mitigation" (ICWRM) that was implemented and just completed by ADPC. JICA is funding a series of five

annual regional disaster prevention and mitigation courses with specific foci, for example, seismic and cyclone mitigation training (for professionals), of which three have already been implemented. In addition, JICA has funded Disaster Mitigation Centers for research and training in several countries in the region such as Indonesia and Nepal, and has greatly increased the resources it is programming for disaster mitigation projects.

The World Seismic Safety Institute (WSSI) and ADPC jointly hosted a workshop of earthquake engineering experts from each earthquake-prone country in Asia. This has resulted in a limited number of new national seismic safety professional organizations and training programs in the region.

D. Recommended Environmental Threshold

The objective of the Asian Urban Disaster Mitigation Project is to reduce the vulnerability to disasters of urban populations, infrastructure, lifeline facilities and shelter by 1) supporting practical demonstrations of how to better prepare for and reduce the impact of disasters, 2) assisting in disseminating successful experiences and information, and 3) helping countries adopt appropriate disaster mitigation policies and strategies for urban areas.

Section 216 of Handbook 3 describes the procedures to be followed by USAID to ensure that environmental factors and values are integrated into the USAID decision-making process. These procedures are meant to be followed by most programs involving construction of infrastructure. Among the classes of actions that are not subject to the procedures set forth in Section 216 are:

> (i) Education, technical assistance or training programs except to the extent such programs include activities directly affecting the environment (such as construction of facilities, etc.);
>
> (iii) Analyses, studies, academic or research workshops and meetings;
>
> (v) Documentation and information transfers.

Activities funded under the first phase of the Project are exclusively training and vulnerability assessments. These fit the three classifications above. The initial grants for demonstration projects will not fund any physical projects. Follow on activities may be proposed after the vulnerability assessments which will also be primarily technical assistance, in setting zoning codes, for instance. Occasionally, however, these

follow on activities may include retrofitting of a demonstration building, like a school or a hospital. This is technical assistance on existing structures, not new construction. While a categorical exclusion is recommended for this Project, it should be noted that an environmental assessment will be requested as part of the proposal for any follow on work involving retrofitting.

V. USAID PROJECT MANAGEMENT AND FINANCIAL PLAN

A. USAID Project Management

USAID staff inputs include about 10 percent of the time of the USDH in RSM/RHUDO. It also includes support from Offices of Regional Procurement and Finance in RSM/Bangkok for the preparation of the grant agreement and processing of vouchers and other financial oversight, such as liaison on routine audits. Finally, USAID staff inputs include one to two weeks' time of each USAID Project team member each year, and OE travel costs, as necessary for team meetings.

B. Evaluations

Two evaluations will be carried out, at Project mid-point (about 18 months into the Project) and at the end of the Project. These evaluations will be contracted by RSM/RHUDO through IQC or other USAID contracts. These two evaluations are estimated to cost a total of $80,000.

C. Financial Plan: Summary of Expected Obligations of Grant Resources:

A USAID grant will support a) Project staff at ADPC, b) national activities in target countries, and c) training, technical assistance and information support to these national activities.

For demonstration projects, there will be a requirement for counterpart funding of at least 15 percent of the costs of demonstration projects (or seven percent of total Project cost). This funding may come from national and local collaborating institutions, and may be either in-kind or direct funding. In addition, ADPC will provide in-kind support valued at about eight percent of total Project cost.

In addition, ADPC will work to increase the dollar value of the Project by soliciting contributions from other donors. While these contributions are not presented as part of total Project costs below, a minimum of $500,000 will be sought from other

regional and international development agencies such as the ADB, World Bank, UNEP-EAP, UNDHA, UNEP/HABITAT, Regional Office for Asia and Pacific (ROAP), and from USAID Missions in Asia. These sources will be looked to for funds to expand project activities in target countries, as well as integrate other countries into the program of activities.

The entire Life of Project Cost is estimated at about $4.3 million, of which USAID's portion would be an estimated $3.8 million, or 88 percent of Project costs. Annual USAID/OFDA grant funding requirements are provided below. A more detailed breakdown of estimated costs by component is provided in Annex J.

FY	Total Cost	Counterpart Funds	USAID/OFDA Grant Funds*
		(in millions of dollars)	
96	1.3	.2	1.1
97	1.6	.2	1.4
98	1.5	.1	1.2
Totals	4.4	.5	3.8

Of the $3.8 million in USAID/OFDA grant funds $3.72 million would be obligated through a Cooperative Agreement with AIT/ADPC and $80,000 would be obligated through IQCs or other USAID contracts for monitoring and evaluation of the Project.

*NOTE:Estimated Grant Funding by Component

Demonstration Projects	$2.00
Training/Policy Workshop	$ .61
Information	$ .19
Sub-Total	$2.80
Project Staff (ADPC)	$1.01
Evaluation (RHUDO)	$ .08
Total	$3.89

Logical Framework: Asian Urban Disaster Mitigation Project (AUDMP)

Goal/Purpose/ Outcomes/Inputs	Performance Indicators	Data Sources	Critical Assumptions
Goal: - Establish sustainable public and private sector mechanisms to reduce loss of life, physical and economic damage, and the disaster recovery period in the Asian region	- Reduction in number of injuries and lives lost, property damage and time to recover from the effects of natural disasters	- Long term indicators after future disaster events to test project outcomes	- Geographically dispersed pilot projects yield easily replicable methods and mechanisms for widespread dissemination of mitigation and preparedness practices at local, national and regional scales
Purposes: - Reduce vulnerability to natural disasters of urban residents infrastructure, lifeline facilities, and shelters in targeted communities - Promote replication and adaptation of successful mitigation measures throughout the region	- Number of national and regional entities using risk audits and vulnerability assessment for site selection, facility design, preparation of development plans - Continued use, replication of new skills/procedures by regional networks beyond pilot project boundaries	- National government requests - Field mission reports and project documents - Regional data base established by PMT	- Governments see mitigation as a priority, and funding institutions include mitigation measures in reconstruction activities
Outcomes: - Adoption of mitigation and preparedness techniques and practices by the public and private sectors in target communities and replication in other communities - New or improved methods institutionalized in local, national policies, procedures and budgets	- Increase in number of private organizations, investors, insurers adopting recommended mitigation and preparedness practices - Increase in number of governments adopting recommended mitigation and preparedness practices	- Project reports on documented cases of replication by participants or other institutions - Distribution and access survey of project promotional materials - Periodic interim and final activity evaluations	- The AUDMP is able to foster a commitment to its overall purposes that will motivate long term social, economic and institutional investment at local and regional levels - Regional institutions and networks continue to promote vulnerability reduction

Inputs: - $3.8 million over 3 years from OFDA - $1.2 million from local counterparts, ADPC and other donor contributions - Demonstration projects - Technical assistance - Training and Policy Seminars - Information Center and networking - Technology transfer - Project management - Monitoring and evaluation	- Workshops held to disseminate project activities, results with other countries in region - Dissemination plan developed to promote broader use of audit techniques, deeper understanding of need for mitigation measures - Methodologies documented to share through network and dissemination plan	- Regularly scheduled project activity reports by PMT - Quarterly reports to Project Steering Committee - Training and workshop agendas - Participant lists, evaluations - Network activity lists	- All collaborating agencies and individuals meet their responsibilities and/or work to develop alternatives as the project process warrants - Collaborating institutions make policy, procedure changes reflecting recommended practices

Logical Framework: India Mitigation Project

Goal/Objective/ Outcomes/Inputs	Performance Indicators	Data Sources	Critical Assumptions
Goal: - Reduce vulnerability to natural disasters of urban residents, infrastructure, lifeline facilities and shelter in a high-risk municipality	- Reduction in number of injuries and lives lost - Reduction in amount of property damage - Reduction in loss of service time for critical facilities and businesses	- Disaster reports - Damage assessments - Post-disaster evaluations - Regional Information Center data collection	- Public and private use of improved hazard information increases - integrity of maps produced can be defended by tech. agencies, municipal government
Purposes: - Assist municipal officials develop useful decision-making tools for development planning and risk management; - Promote identification and adoption of private sector mitigation activities	- Regular updates made to hazard map data - Hazard maps and vulnerability assessment information are available, accessed by private sector - Methodologies and applications continue to be taught, promoted	- Project evaluations - Municipal records - CEPT planning curriculum course records	- Line item support is provided at state level to enable requests for replication to be funded - Municipal planning process is inclusive
Outcomes: - Committee of NGOs, private sector, municipal officials meet update urban vulnerability data on regular basis - Maps create integrated platform for citizen groups, municipality to use for their benefit - Vulnerability assessment methodologies adopted by municipality for public sector planning/zoning of critical infrastructure - Vulnerability assessment methodologies adopted by investors, developers, other private sector stakeholders in the industrial-commercial base of the municipality - Appropriate mitigation measures adopted by low-income residents and businesses - Other municipalities show interest in using the demonstrated approaches	- Change in number of hazard maps produced for municipality - increased private activities, advocacy regarding protection and health - Integration of hazard/vulnerability assessment methodologies in municipal planning procedures, regulations - Number of requests for mitigation methodologies, demonstration experience from other municipalities	- Hazard maps produced - Land use, zoning plans - Municipal records - Project documentation report to PMT - Private business preparedness plans - NGO activity reports - MAG minutes	- Project can show benefits of using the methodology for development planning and risk management - Experience is successfully communicated throughout state, to other states with similar vulnerabilities and to national level

Inputs: Demonstration project Technical assistance - Hazard vulnerability assessment, mitigation strategies for informal sector, community Training & Policy workshops - Skills training for municipal officials, NGO's Promotion/Public Awareness - Seminars on applications for investors, planners, developers, bankers - Workshops for small business, community groups, state, national officials Information support and networking Funds: Project, Counterpart, Other Donors Monitoring and Evaluation	- Addition of hazard maps and vulnerability assessments to municipal database - Development of applications guidelines targeting municipal issues, private investors, community-based activities - Workshops, seminars held	- CEPT activity reports to ADPC PMT - Workshop, course schedules, participant lists - Community meeting agendas	- Data available is accessible, can be validate - Collaborating organizations, agencies commit staff, resources as agreed

Logical Framework: Indonesia

Goal/Objective/ Outcomes/Inputs	Performance Indicators	Data Sources	Critical Assumptions
Goal: - Reduce vulnerability to natural disasters of urban residents, lifeline infrastructure and critical facilities as a part of sustainable municipal development	- Reduction in lives lost and injuries - Reduced infrastructure, critical facilities damage , and reduced critical facilities, lifeline and business recovery time	- Damage assessments, reports - Post disaster evaluations - Regional information center data collections	- Governments and private institutions make policy, procedural changes to promote mitigation measures - Data is collected to enable comparisons
Purposes: - Establish methods to reduce the vulnerability of urban infrastructure and critical facilities (especially schools) - Strengthen national disaster mitigation policy that will replicate mitigation methods in other municipalities	- Municipalities adopt recommended mitigation and preparedness practices - Level of public/private collaboration to achieve vulnerability reduction - No. of retrofitted school buildings based on recommended safer techniques	- National policy documents - Municipal records, meeting minutes, school inspection reports - Project evaluations - School inspection reports	- Private companies use assessments and mitigation recommendations - Pilot projects yield easily replicated methods, mechanisms for dissemination of mitigation and preparedness practices
Outcomes: - Hazard maps, vulnerability assessments used for municipal development decision by public and private sectors - Community groups use disaster maps to revise preparedness and mitigation plans - Preparedness and mitigation measures adopted and used by the municipality - Assessment methods and mitigation measures adopted into public sector, zoning, codes and planning requirements - Assessment methods, mitigation measures used by private investors, developers of the municipality commercial, industrial base - National disaster mitigation policy, procedures implemented; other cities adopt and replicate methods and strategies	- Increase in risk audits performed in country for critical facilities - Increase in vulnerability assessments of lifeline infrastructure - Assessment and strengthening procedures documented, disseminated - Continued and replicated use of mitigation techniques by government and private institutions, contractors and professionals after project completion	- Workshop programs, list of participants, evaluations - Final reports on procedures established recommendations made following audit reports - Guidelines/standards printed for dissemination - SATLAK , SATKORLAK and NGO community preparedness plans - Published GOI detailed mitigation policy and procedure documents	- Government and private institutions in target area participate in workshops, promotion, programming and training - Private institutions choose to participate in mitigation and retrofit activities

Inputs: Demonstration project Technical assistance - Hazard vulnerability assessments, maps; Kampung, city mitigation measures; policy assistance to BAPPENAS Technology transfer Training & policy workshops - Urban mapping, analysis; hazard maps, vulnerability assessment; building, lifeline risk audits; policy seminars Information and networking support - Manuals, training materials distributed; Funds: Project, Counterpart, Other Donors Monitoring and evaluation	- Hazard maps added to city information base - Risk audit procedures developed - Risk audits performed in target area - Participants demonstrate successful completion of training - Workshop, seminars held - Manuals, training materials distributed	- Regularly scheduled activity reports from ITS to PMT - Workshop, course schedules, participant lists - Kampung meeting agendas - Interim and final activity evaluations	- Collaborating institutions successfully recruit qualified personnel - Required technical data is available

Logical Framework: Nepal

Goal/Objective/ Outcomes/Inputs	Performance Indicators	Data Sources	Critical Assumptions
Goal: - Reduce the physical, social and economic consequences of earthquakes in Kathmandu Valley	- Reduction in lives lost and injuries - Reduction in damage to buildings, lifelines and critical facilities - Reduced time business, critical facilities, loose services from earthquake	- Disaster reports - Damage assessments - Post-disaster evaluations - Regional Information Center data collection	- Improved awareness and technology ability is translated into public, private demand, providing visibility and incentive - Disaster mitigation seen as key development issue
Purposes: - Assist local officials to assess potential earthquake impact for Kathmandu Valley - Establish mechanisms to guide planning construction, service provision - Raised awareness of earthquake risk and implementation of mitigation measures	- Number of public sector agencies adopting recommended changes - Development planning reflects understand of earthquake risks - New monitoring, evaluation, or enforcement mechanisms established	- Institutional reports - Professional meeting agendas - Building inspections - Project evaluation	- Building code plus rules of thumb for non-engineered structures are adopted by the national government
Outcomes: - Hazard, vulnerability, risk assessments of Kathmandu Valley critical facilities and lifeline infrastructure prepared based on likely scenario earthquake - Comprehensive earthquake mitigation program with identified resources - Permanent institutional focal point established to advocate earthquake safety and preparedness - Improved awareness and skills among earthquake professionals	- Vulnerability assessments performed for buildings, lifelines, critical facilities - Report disseminated on damage estimates of scenario earthquake and recommended mitigation program - Disaster mitigation council of government, business and industry leaders established - Council meets regularly to review progress of mitigation program	- Council minutes - Project documentation - Demonstration project report to PMT - Institutional reports (NSET, Ministry of Housing, etc.)	- Data available and accepted as accurate - Participating organizations, agencies commit staff and resources for training, assessment and Council activities

Inputs: Earthquake scenario demonstration - Framework for multiple year earthquake risk reduction program implemented by public and private sectors - Charter for business and industry council of Emergency and Preparedness Technical assistance - Earthquake scenario to forecast consequences of damages Technology transfer Training and policy workshops - For local investigators to create damage assessments - For overseers to identify and minimize building vulnerabilities - Workshops to identify mitigation and preparedness strategies Information and networking Funds: Project, Counterpart, Other Donors Monitoring and Evaluation.	- Documentation and dissemination of earthquake scenario - Training participants successfully demonstrate understanding of course material - Workshops held; technical assistance provided	- NSET reports to ADPC PMT - NASC reports, participant lists, agendas to ADPC PMT - Proceedings of scenario and other workshops - Technical consultants reports	- Collaborating institutions successfully recruit qualified personnel - Private institutions choose to participate in retrofit activities - Collaborating organizations and agencies commit staff and resources agreed - Required technical data is available, affordable - Funds available and interest exist to attend workshops and seminars

Logical Framework: Philippines

Goal/Purpose/ Outcomes/Inputs	Performance Indicators	Data Sources	Critical Assumptions
Goal: Reduce vulnerability to natural disasters of residents, infrastructure, critical facilities and shelter as a part of sustainable municipal development in GOP designated economic growth centers.	- Reduction in number of injuries and lives lost - Reduction in amount of property damage - Reduction in loss of service time for critical facilities and businesses	- Disaster reports - Damage assessments - Post-disaster evaluations - Regional Information Center data collection	- Public and private use of improved hazard information increases - Integrity of maps produced can be defended by technical agencies, municipal government
Purposes: - Improve understanding of national and local, public and private leaders about the risk, potential consequences, and methods of mitigating flash floods and earthquakes in high risk municipalities - Strengthen mechanisms that manage the municipal flood and earthquake risk	- Municipal disaster information is regularly updated, used by public, private sector in planning and investment decisions - Mitigation methods and strategies continue to be taught, promoted and used	- Project evaluations - Municipal records - National urban policy documents - PHIVOLCS, LGA/UP League of Cities records	- Municipal planning process is inclusive and transparent
Outcomes: - Community groups review, update city hazard and vulnerability information and use to develop community preparedness plans and mitigation strategies - Preparedness and mitigation measures adopted and used by Baragays, business. - Cities adopt mitigation methods to plan critical facilities and infrastructure - Private investors, developers adopt mitigation methods to analyze investment in city industrial and commercial base - Other municipalities replicate mitigation methods and strategies demonstrated - National policy, budget with incentives to replicate methods, strategies.	- Increase of municipal and Baragay level hazard maps, vulnerability assessments, and preparedness/mitigation plans. - Integration of disaster assessment and mitigation strategies in municipal and private sector investment and planning process, procedures and regulations. - Increase in investments where vulnerability assessments and mitigation strategies are used - Number of municipalities that replicate demonstrated methods and strategies - National policy that encourage adoption and replication of methodologies and strategies of the demonstration project	- Hazard maps and vulnerability assessments produced - Preparedness and mitigation strategies implemented - Municipal and NEDA records - Municipal zoning and code changes and enforcement - Land use and zoning plans - National policy and urban sector programs	- Projects demonstrate the benefits of using mapping , vulnerability assessments and mitigation strategies for development planning and risk management - Experiences are successfully presented and transferred to other similarly disaster prone municipalities

Inputs: Demonstration project Technical Assistance - Hazard vulnerability assessment; informal sector, community, city mitigation plans Training and Policy workshops - Urban mapping, analysis; hazard and vulnerability maps, vulnerability risk assessment; building, lifeline risk audits Promotion/Public Awareness - Manuals and training materials distributed nationally; mitigation workshops for public officials and private investors; policy workshops for national, municipal officials Funds: Project, Counterpart, Other Donors Monitoring and Evaluation	- Hazard and vulnerability maps added to municipal GIS databases - Vulnerability assessments incorporated into investment process - Workshop and seminars held - Manuals and information distributed	- PHIVOLCS and LGA/UP activity reports to ADPC PMT - Workshop and course schedules; participant lists - DCC and Barangay level meeting agendas	- Data is available and is accepted as accurate - Funds available and interest exist to attend workshops and seminars - Collaborating organizations and agencies commit staff and resources agreed

Logical Framework: Sri Lanka

Goal/Objective/ Outcomes/Inputs	Performance Indicators	Data Sources	Critical Assumptions
Goal: - Reduce vulnerability through enhanced ability to monitor hazardous conditions from rain induced flooding, landslides and spreading of contaminating materials	- Prototype additions to the National Environmental Act including review criteria mitigating measures and incentives	- Landslide hazard maps produced by the NBRO - Ministry of Housing Construction and Urban Development background information on past projects	- Formal channels of access, transmission to local levels of hazard data can be created; application of hazard reduction techniques to planning occur - Participation by the private sector in risk reduction must occur
Purpose: - Improve capability of the national GSL, local government and the private sector to reduce the effects of landslides, flooding and contamination	- Management framework to define and prioritize risk reduction issues and coordinate activities - Management structure with division and staffing for environmental unit at CEA - Management structure for environmental division of municipal planning dept.	- Landslide damage assessment s - Flood and contamination reports - Land use data - Industrial spill data	- Adequate funding must be allocated to national Ministry as well as local level government units for staffing - Adequate funding and support must be available for monitoring equipment including water quality analysis
Outcomes: - Increase national and local capability to monitor rain induced flood conditions and instability - Increase national and local capability to reduce incidence of landslides, flooding and pollution - Reduced threat to drinking water quality; fragile ecosystems	- Rain gauges installed at landslide sites and upstream areas of catchment basin - Established early warning system to monitor earth movement in 2 target landslide prone communities - Criteria to be used in land use decisions to reduce incidence of landslides, flooding and pollution - GIS capability to correlate diverse catchment basin conditions (water flow rates and depths, flood way, land use)	- Reports from workshops and courses - Reports from installed monitoring systems - Documentation of landslide mitigation measures as constructed - Landslide hazard reduction manual video: The River	

Inputs: Demonstration - Construct prototype mitigation techniques - Installation of water (flow) Technical Assistance - Develop low cost monitoring capability - Develop environmental information analysis capability for Kelani river catchment basin - Define management structure for Kelani river catchment basin - Risk maps correlating vulnerabilities with flood and pollution hazards Training - Workshop on water quality monitoring, landslide hazard monitoring and mitigation alternatives, integration of hazard information with land use to define risk Funds: Project, Counterpart, Other Donors Monitoring and Evaluation	- Establish monitoring capability for flow and water quality - Educational materials including school curriculum and video - Manual explaining monitoring tools for early warning and construction practices including drainage and cut-filling techniques - Installation of monitoring tools; construct drainage, etc. mitigation systems - Evaluation from participants - Document installation of monitoring devices - Document construction of mitigation in writing and in film	- Hazard maps produced for pilot areas - Presentations by workshops presenters - Course documentation	

India: National Project Description

Project Background/Problem Definition

Although numerous activities have been undertaken and a great deal of expertise is at hand, there is little sense of any national strategic plan for mitigation in India in spite of the frequency of natural hazard events (floods and flash floods, droughts, cyclones, earthquakes, landslides, avalanches). On the relief side, the Ministry of Agriculture houses the primary natural disaster management functions with operational authority devolved to the state level. A Crisis Management Group brings together relevant ministries to coordinate national response efforts. Each state receives a set amount for relief plus additional assistance as needed from national-level resources (e.g., air transport, military). State Relief Commissioners direct and control assistance to affected districts.

Constitutional Amendment 74 (1992) further shifts power to municipalities, which are in any case the primary responders. As the closest governmental unit to the people, a municipality could be expected to reflect and respond to the interests of all its citizenry with regard to protection, preparedness and response. However, interviews, national reports and numerous case studies indicate that the links between municipalities and other relevant public and private resource institutions and community interests are poor, as is interdepartmental coordination.

Project Justification

The need for improved decision-making tools for assessing risk and reducing vulnerability is critical for both the public and private sectors. Many growing urban centers in disaster-prone areas are missing the opportunity to protect their expanding industrial and commercial bases through strategic planning of development investments. These centers also continue to attract a low-income population looking for increased income opportunities and services; their homes are generally sited in the least desirable areas, and their informal markets and entrepreneurial activities are highly vulnerable to natural disasters -- physically, socially and financially.

Municipal authorities; professional, commercial and industrial agencies; planners; developers; lending institutions; insurers; home and shop-owners; day-laborers: all have an increasing stake in protecting their investments as their well-being becomes more and more intertwined with the health of their city and with the stability and sustainability of its investment climate.

Constraints and How They Will be Addressed

Constraints to effective planning and implementation of mitigation and preparedness at the municipal level include:

- Both local socio-economic information and technical knowledge of mitigation methodologies are lacking, either because they do not exist at that level of government, because they exist in scattered fashion, or because they are not organized in an easily-used form.

- Where the information does exist (for example, on a state or national level), it frequently is not accessed because no mechanism has been developed for that purpose either in the public or private sector.

- Application of disaster-related data is frequently limited to narrowly-defined disaster topics; application to development planning is lacking.

- *Ad hoc* mitigation activities often fall short of expectations because they are not part of a broader strategic plan (for example, flood damage in India is increasing despite increased expenditures on control).

- The shift in responsibility from state to municipality has not yet been accompanied by a complete revision of budgetary line items.

This project will encompass a series of directly-linked activities carried out in an urban growth center located in a high-risk area. Needed inputs include technical assistance, training, and workshops to facilitate and promote policy or procedural changes. These will be directed toward:

1. production of hazard maps to provide a structured information base that can be related to current urban environmental mapping projects;

2. skills training for municipal officials and corporate officers in the Chamber of Commerce and industry;

3. vulnerability assessments for basic infrastructure, services and critical public facilities according to locally-defined priorities;

4. seminars on applications/benefits for private sector investors/developers/ lenders, etc.;

5. development and dissemination of community-level applications for individuals and small businesses; and

6. workshop to present and promote use of hazard mapping/vulnerability analysis as a tool to improve risk management and enhance the development and healthy growth of other municipalities.

This approach will engage both public and private sector leaders and organizations as collaborating partners on an local advisory committee. The inputs will give guidance on how to integrate hazard maps into the planning process and set priorities for development. They also will emphasize implementation of mitigation measures by local residents.

Goal and Purposes

The project goal is to reduce the vulnerability to natural disasters of urban residents, lifeline infrastructure, critical facilities and shelter in a targeted municipality.

The project purposes are:

1. to assist municipal officials in developing a useful decision-making tool for development planning and risk management; and

2. to promote identification and adoption of private sector mitigation activities.

The project specifically targets: 1) the municipal governments now charged with new disaster responsibilities and 2) individuals/groups in the private sector who can utilize improved information and methodologies for self-protection. It will strengthen municipal ability to forecast, monitor, respond to and develop mitigation strategies for natural hazard events affecting their citizenry. At the same time, it will promote and build on appropriate local initiatives in the private sector, working with citizen's groups, NGOs and professional organizations to raise awareness of the issues and promote adoption of mitigation and preparedness practices in their home and business lives.

Intended Results

1. Hazard maps produced and added to the existing resource of municipal decision-making tools, to provide improved data for risk management and development planning.

2. Workshops conducted for municipal and state officials and professional groups to explain the methodologies and applications.

3. Promotion and encouragement provided for integration of natural hazard data applications into municipal and state policies for emergency preparedness, response and mitigation concerns.

4. Dissemination and training in the private sector, particularly for low-income residential and school sites, and vulnerability reduction for small businesses.

5. Vulnerability assessments of basic infrastructure and critical public facilities.

6. Linkages established with other relevant individual and institutional resources.

7. Joint public/private sector pre-disaster planning to optimize the strengths and resources of both sectors.

Outcomes (Impact of the proposed activities)

1. Joint committee of NGOs, private-for-profit groups, public sector and municipal officials meetsand update urban hazard data for the municipality on a regular basis.

2. Maps create an integrated platform for citizen groups and municipal authorities to use for their benefit.

3. Vulnerability assessment methodologies are adopted by the municipality for public sector planning/zoning of critical infrastructure.

4. Vulnerability assessment methodologies are adopted by investors, developers and other private sector stakeholders in the industrial/commercial base of the municipality.

5. Appropriate protective measures are adopted and adapted by low-income residents and businesses of the municipality.

6. Other municipalities in the state and in other states request information on the

methodologies and experiences of the demonstration project, with a view toward replicating or adapting the approach.

Opportunities

The National Institute of Urban Affairs (NIUA) in New Delhi is currently carrying out a RHUDO/New Delhi effort to introduce Urban Environmental Maps as a municipal tool to impact political decisions, policies, training and information. It is a logical extension of this work to add a hazard mapping component which would complement and supplement the information base on which research and infrastructure development programs can be built.

A number of activities are underway that are currently fragmented but could be linked via this project's workshops, seminars and information dissemination elements. For example, vulnerability assessments are being undertaken in Maharashtra (focusing on housing and seismic vulnerability) with support from the UNDP and various NGOs. Steps can be taken to establish a dialog with these efforts, possibly through the MOUD, so that a national comprehensive vulnerability assessment methodology might be a long-term outcome.

A collaborative relationship should be established with the National Informatics Center which is now tasked with collecting gross data such as death and economic damage statistics for all districts. This demonstration project will provide a useful structure to assist the NIC in knowing what data is useful and how it can be used cooperatively.

A private sector initiative, the Indian Institute of Disaster Management in Baroda, appears to be devoted to chemical and other "man-made" emergencies, but its existence offers a mechanism for private sector involvement in broader hazard awareness and mitigation.

For public awareness and development of local initiatives among low-income residents and the informal business sector, NGOs are a major resource. For example, CASA has long been active in community development, disaster preparedness and reconstruction activities throughout India, has a well-respected and capable staff, and is interested in being involved in this project from design through to the replication stages. CASA is an institutional collaborator that offers high potential for incorporating these activities in their future work far beyond the confines of a demonstration project.

There are two cities that offer potential for a highly-successful demonstration project. They are Visakhapatnam in Andhra Pradesh and Ahmedabad in Gujarat.

Visakhapatnam is a major industrial town with a population of approximately 1.5

million on the northern coast of Andhra Pradesh. As the third largest port, it has expanding infrastructure and a growing commercial and industrial base to protect from the frequent cyclonic storms of the Bay of Bengal, but it has no plan. Although there is no disaster-related component, the NIUA is currently conducting a study of the economic and industrial base in a separate activity, so this project could build on a database of recently-gathered information. In addition, selection of the state of Andhra Pradesh as one locus for the project is based on 1) its high degree of awareness due to recent and recurrent hazard events (cyclones, storm surges, droughts); 2) identification of its administrative personnel as being competent, aware and committed; 3) success of its flood preparedness efforts (comparison of 1977 and 1990 cyclone impacts is now used as a case study for preparedness/evacuation in training programs). The possibility of replication is enhanced by the location of A.P. between the two similarly aware and vulnerable states of Orissa and Tamil Nadu.

The state of Gujarat provides a second possible locus of activities. Flood, flash flood and drought are frequent hazard events and awareness of the threat is high. Urban environmental maps have been produced for Ahmedabad and the addition of hazard mapping would complete the package available to municipal authorities. In addition, the state is impressed with the possibilities of this tool and has recently added a budgetary line item that would enable other towns to replicate this undertaking, so a growing urban center such as Morbi might offer a good opportunity for expansion of the mapping, applications and implementation activities.

Lead National Institution

The Centre for Environmental Planning & Technology (CEPT) in Ahmedabad is the only institution in India which offers a post-graduate course on environmental planning. It is a well respected and appropriate choice to disseminate, institutionalize, replicate and carry forward the applications methodology. CEPT has staff willing and eager to manage the work who has not only the academic credentials but also good NGO relationships, a strong network with municipalities and a long involvement with community preparedness and mitigation issues (the director of the center, since the Calcutta floods 20 years ago). CEPT has carried out training and workshops in collaboration with the National Institute for Urban Affairs (NIUA) including the recent Urban Environmental Maps workshop funded by RHUDO/New Delhi as a component of the USAID FIRE Housing Guarantee Loan project. CEPT also has well-developed GIS capability to enable updating and to offer a model for India to continue to develop with municipalities throughout the country and at the national level.

(If the project activity is undertaken in Andhra Pradesh, the capabilities and interest of

the Administrative Staff College in Hyderabad should also be determined.)

Collaborating Institutions

Local:	Municipal Relief Commissioner Municipal Officials Representatives from Service Boards Church's Auxiliary for Social Action (CASA) Disaster Mitigation Institute Private Businesses Planners and Construction Professionals Chambers of Commerce and Industry
National:	Jt. Sec'y of Agri./National Disaster Office (Sunil Sud) Ministry of Urban Development Council for People's Action in Rural Development UNDP National Information Center Roorkee University Indian Institute for Public Administration Confederation of Indian Industry National Safety Council of India (NSCI) Indian Institute of Disaster Management (IIDM), Baroda Disaster Mitigation Institute (DMI), Ahmedabad

Indonesia: National Project Description

Project Background/Problem Definition

Indonesia's disaster "proneness" ranks high within Asia which is by far the most disaster prone region in the world. According to Office of Foreign Disaster Assistance (OFDA) statistics, in the last 25 years Indonesia has experienced about 122 disaster events compared to 181, 127, 107 events in India, Philippines and Bangladesh respectively. Indonesia's potential vulnerability is also growing as the population base becomes more urbanized and infrastructure continues to be developed. Today, half the nation's population of 183 million people are concentrated on the island of Java. By the year 2004, only eight years from now, it is estimated that half of Indonesia's entire population will be living in cities.

Natural disasters experienced in Indonesia include earthquakes, volcanic eruptions, landslides, tsunamis, floods, and strong winds. In the last 25 years, about 8.6 million people have been affected by natural disasters in Indonesia and the total damage from disasters is estimated to be about $660 million. Of this total, 80% is attributed to damage from geological disasters such as earthquakes, landslides and volcanoes.

A part of the "Ring of Fire", Indonesia is one of the most seismically active regions in the world, accounting for 8% of the world's total earthquake epicenters. Indonesia also has about 500 volcanoes, of which 129 have been active in recent geologic time. During the average year there are 350 earthquakes. Ten are likely to be major, with one to three causing some form of destruction. Most importantly, some of Indonesia's largest cities are located in its many high risk, seismic areas.

Indonesian earthquake experts at the Geological Research and Development Center (GRDC) believe that historic damage levels have been low compared to the present potential risk and vulnerability. GRDC believes this is especially true, as the population base moves into urban centers and the comparatively minor damage which Indonesia has faced is compared to number of earthquakes occurring annually. Landslides triggered by earthquakes, as well as from the increased weight of water saturation and construction due to urbanization are also threats as cities expand into highly sloped adjacent areas.

Project Justification

Recent national policy changes reflected in Chapter 34 of REPELITA VI (The Sixth Five Year Development Program) are encouraging indicators of the significantly greater emphasis which the GOI (Government of Indonesia) wishes to give to prevention, mitigation

and preparedness. Chapter 34 of REPELITA VI also provides for an operating budget for BAKORNAS PB (National Coordinating Board for Disaster Management), further strengthening this important board's ability to manage disaster issues.

However, BAPPENAS (National Development Planning Board) has correctly noted that, even though the overall national policy is now in place, little has been done to develop the detailed policy and procedures required to implement the new national policy and make mitigation a significant part of the development process. BAPPENAS and BAKORNAS PB have both indicated great interest in this project as an input into the development of a more detailed implementation plan for the GOI disaster mitigation policy.

There are presently few up-to-date land use maps, no hazard maps or vulnerability assessments of Indonesia's most disaster prone municipalities and no methodology, procedures or budget for their development. Therefore, disasters are not a significant consideration in the urban planning or investment decision making process that takes place at the local level. GRDC (Geological Research and Development Centre of the Department of Mines and Energy) has prepared national and provincial level geological and seismic maps, some with USGS (United States Geological Survey) assistance under the WWERMS project. GRDC has also prepared large scale geological and seismic maps of several municipalities.

GRDC has expressed concern that they have not yet developed a methodology or a program for the preparation of large scale maps that can be used by municipal planners, engineers or architects. Building on presently available maps and a recently acquired GIS capability, GRDC is in a position to take the next step in developing methodologies and then a long term program for the preparation of geological hazard maps usable by municipal development planners for all high risk urban areas in Indonesia.

Deputy V in BAPPENAS serves as the GOI institution responsible for planning the financial resources made available for urban and infrastructure investment programs. Because of this role, Deputy V is a natural link to ensure that disaster mitigation becomes a substantially stronger component in the development of the annual urban investment program. In particular, BAPPENAS is in a position to significantly increase the importance of disaster mitigation in the decision making process regarding municipal infrastructure investments.

Recent earthquakes in the smaller cities such as Maumere and Ende on Flores Island in 1992 and Liwa in Lampung in 1994 have demonstrated the high vulnerability of structures and infrastructure throughout Indonesia's most earthquake prone cities. It has also highlighted the lack of disaster vulnerability assessment procedures, methodologies and strategies available for use by urban development decision makers nationwide.

One type of critical facility appears to be particularly vulnerable. In both Flores and Lampung, a disproportionately large number of schools collapsed or were severely damaged due to poor construction indicating a high vulnerability and larger national scale problem. In Flores almost 70% of all school classrooms in the earthquake affected area were either heavily damaged or destroyed. The Department of Education and Culture, Indonesian civil engineers and municipal planners have specifically expressed concern about the high, nationwide vulnerability of schools and the students in them to earthquakes. If the urban development process does not fundamentally incorporate the potential impact of disasters, disaster risk and vulnerability will continue to increase, potentially setting back development progress especially in quickly growing urban areas.

Constraints and How They Will be Addressed

Constraints to making disaster mitigation a component of the development process at the municipal level in Indonesia are:

- The lack of reliable hazard, vulnerability and risk maps inhibits the ability of planners to locate infrastructure in areas less prone to natural hazards. Data needed to produce maps is scattered in various Government institutions, or may be incomplete.

- There are a large number of Government institutions that regulate land use planning and the fragmentation of responsibility is an obstacle in introducing sound land use planning approaches regarding natural hazards.

- The risk auditing for essential facilities like schools, hospitals and other services is currently not known and therefor, most probably introducing methods of retrofitting and strengthening of those facilities might be a slow process.

- Required socio-economic information and technical knowledge of mitigation methodologies are lacking at national and municipal levels.

- Overall national policy is in now place, but no efforts are presently underway to develop a national disaster mitigation program and no detailed policy, procedures or budget have been developed to form the basis for such a program.

In order to address these constraints the project will support a series of interrelated activities carried out in a growing municipality located in a highly disaster prone area. Basic inputs include technical assistance, skills training, information collection and dissemination, and workshops to facilitate and promote appropriate disaster mitigation policy and procedures.

These activities will be directed toward the following:

1. production of hazard maps presented at an appropriate scale and in a way understood by development decision makers that will provide the base information needed to assess the vulnerability of municipal critical facilities and infrastructure;

2. training of public and private development decision makers on the preparation of vulnerability assessments, cost benefit analysis and identification of mitigation measures;

3. vulnerability assessments of basic municipal infrastructure, low income communities, and critical public facilities and services based on community priorities;

4. design and implementation of identified mitigation strategies in target municipality to demonstrate the cost effectiveness of municipal mitigation programs ;

5. development and dissemination of community level vulnerability assessments and mitigation measures;

6. seminars on applications and benefits for private investors, developers and lenders as well as public officials; and

7. assistance to national agencies such as Deputy V, BAPPENAS, BAKORNAS PB, and the Department of Education and Culture on the development of detailed policy, procedures and a national program for municipal disaster mitigation.

To be able to collect the necessary data from the various institutions, the Lead National Institution must include BAKORNAS PB as one of their collaborative institution. BAKORNAS PB has access to institutional networks capable of operating at central, municipal and community level. Intersectoral planning must be encouraged and enhanced between the institutions responsible for land use planning and incorporating natural disaster mitigation in Indonesia. It would be appropriate to provide support to these institutions by providing technical assistance to strengthen their capacity for facilitating the inclusion of hazard mitigation measures within the National development process.

The site specific technology of vulnerability and risk assessment must be introduced by holding training workshops that could disseminate the methodology to a larger group with the aim that once a better understanding is achieved, assessments could be replicated. Once essential infrastructure and facilities have been identified as vulnerable to natural hazards,

retrofitting and strengthening methods must also be widely introduced.

Goal and Purposes

The project goal is to reduce vulnerability to natural disasters of urban residents, lifeline infrastructure and critical facilities as a part of sustainable municipal development in Indonesia.

The purposes are to:

1. establish methods to reduce the vulnerability of infrastructure and critical facilities (especially schools) to natural disasters in municipalities; and

2. strengthen national municipal disaster mitigation policy and procedures that will replicate disaster mitigation methods in other municipalities of Indonesia

The project specifically targets municipal governments and related national ministries that have specific disaster mitigation related mandates and are interested in developing practical methodologies for the application of new national disaster mitigation policy. It will broaden and enhance the role of disaster mitigation in the municipal and infrastructure development process. The project will support two of the Strategic Objectives stated in the USAID Mission Strategy Update and Prism Monitoring System document. Primarily, say 70%, the AUDMP will support Strategic Objective 4: Strengthen Urban Environmental Management. Secondarily, say 30%, the AUDMP will support Strategic Objective 1: Sustained Economic Growth.

Intended Results

1. Hazard maps produced and added to the existing resources for municipal investment decision making based on disaster risk management.

2. Vulnerability assessments prepared for basic infrastructure and critical facilities (including risk audits of individual schools).

3. Evaluation of planned existing and planned infrastructure and critical facilities (such as schools) from which mitigation measures (retrofitting or design changes) will be implemented and community and municipal preparedness plans will be revised.

4. Skills development and policy workshops conducted for municipal, provincial and

national level development decision makers from both public and private sector.

5. Collection and dissemination of disaster information to development decision makers.

6. Preparation of a detailed national program, policy and procedures for incorporating disaster mitigation into the municipal development process that can apply to all municipalities in Indonesia.

Outcomes (Impact of the proposed activities)

1. Hazard maps and vulnerability assessments are regularly updated and form part of the basis for municipal development decision making by both the public and private sectors.

2. SATLAK PB and SATKORLAK PB (Provincial and Community Level Disaster Management Boards) and NGO's use disaster maps to develop community level preparedness plans and mitigation strategies.

3. Appropriate preparedness and mitigation measures are adopted and used by school systems, low-income residents and businesses of the municipality.

4. Assessment methodologies and mitigation measures are adopted and incorporated into public sector planning, zoning and codes for critical facilities and infrastructure.

5. Assessment methodologies and mitigation measures are adopted and used by private investors, developers of the commercial and industrial base of the municipality.

6. Detailed national disaster mitigation policy, procedures and budget is implemented resulting in other municipalities adopting and replicating demonstrated methods and strategies.

Opportunities

Although other municipalities may be considered, at present the municipality of Bandung offers great potential as a successful demonstration project site. Recently completed geological mapping of Bandung by GRDC and planned large scale earthquake mapping by GRDC under a technical cooperation agreement with USGS through the US Embassy offers almost complete information needed to prepare large scale earthquake hazard maps for Bandung. Bandung is in one of the regions identified by GRDC as having a very high risk of

experiencing a damaging earthquake. Bandung would experience both severe ground shaking as well as liquefaction. Bandung also experiences flooding. Bandung is the third largest city in Indonesia with a population of over 2 million and is experiencing strong population and economic growth. ITB is located in Bandung, therefore the municipality seems to be ideally suited as a potential site for the demonstration project.

The project will be to develop and demonstrate a methodology for the preparation of hazard and vulnerability maps in a GIS format for one city. Flood hazard maps will also be layered into this as well as land use maps, building inventories, critical facilities and lifeline infrastructure. These maps will then be used as the basis for demonstrating appropriate methodologies for evaluating planned urban investments in infrastructure or critical facilities. Strategies will be developed to reduce the vulnerability of these investments to disasters and will then be incorporated into the design of the projects. The maps will also be made available to the SATLAK PB (Provincial Disaster Management Board) and SATKORLAK PB (Local Disaster Management Board) and city preparedness plans will be further developed.

Existing and planned schools in this city will be specifically targeted to evaluate their vulnerability to disasters (especially earthquake) and retrofitting strategies will be developed for several school building types. Two or three school types will be selected to demonstrate actual retrofitting techniques. Earthquake resistant designs will be developed for use in the national school construction program.

Parallel to the above demonstration, a short term international consultancy will be provided to BAPPENAS to assist them in developing a more detailed disaster management and mitigation strategy that will be used as the basis for implementing their new disaster management and mitigation policy and that will include recommendations for implementing the methodologies developed (above) as well as others.

Lead National Institution

Given the current political and developmental situation in Indonesia, as well as the multi-sectorial nature of disaster mitigation, an academic institution is the best institution to carry out the role of Lead Implementing Institution. Several possibilities will be considered which include a) the Institute of Technology Bandung (ITB), Center for Urban and Regional Development Studies, b) the Institute of Technology Surabaya (ITS), Laboratory of Housing and Human Settlements, and c) Petra Christian University in Surabaya, Civil Engineering Program.

The final project will be designed by the Lead National Institution based on AUDMP

proposal guidelines. This will be done in cooperation with other GOI and private organizations involved in the project. The proposal will be reviewed by a the Project Steering Committee to ensure that the proposal complies with program guidelines. Once a proposal meets all requirements, a sub-contract will be developed between ADPC and the selected Lead National Institution. The proposal will also be reviewed by BAPPENAS to be incorporated in the national planning and budgeting process. The Lead National Institution will then implement and manage the project. Where necessary, ADPC and other international specialists will provide technical and training inputs.

Collaborating Organizations

In order to achieve a national impact, the program must collaborate and coordinate closely with the following local and national institutions from both the public and private sectors.

Local:	Local Governments (DATI II) Provincial Governments (DATI I) BAPPEDAS (Provincial Development Planning Board) SATLAK PB (Provincial Disaster Management Board) SATKORLAK PB (Local Disaster Management Board) Selected NGOs involved in mitigation and preparedness
National:	Deputy V in BAPPENAS BAKORNAS PB Geological Research and Development Centre (GRDC) Department of Public Works Department of Education and Culture Indonesian Society of Structural Engineers (HAKI)

Nepal: National Project Description

Project Background/Problem Definition: The Earthquake Threat in Kathmandu Valley

Nepal has long history of destructive earthquakes. In this century alone over 11,000 Nepalese have lost their lives in four major earthquakes. A 1934 earthquake in Kathmandu Valley, with an estimated intensity of IX-X MM, destroyed 20% and damaged 41% of the housing stock. In Kathmandu, one quarter of all homes were destroyed.

This earthquake was not an isolated event. Earthquakes of intensity IX-X struck Kathmandu Valley in 1810, 1833 and 1866. The seismic record of the region suggests a return period of a quarter of a century, indicating that a devastating earthquake is inevitable in the long run and likely in the near future.

A large earthquake today in central Nepal's Kathmandu Valley would likely cause significantly greater human loss, physical damage and economic crisis than experienced in past earthquakes. With Kathmandu Valley's burgeoning population of almost a million people, unplanned, uncontrolled development, and building construction which has changed little in the past century, Kathmandu Valley becomes increasingly vulnerable to catastrophic earthquakes with each passing year.

Project Justification: Addressing the Earthquake Threat

There is a need to identify and strengthen an institution within Kathmandu Valley to assess earthquake hazards and manage an earthquake hazard mitigation program. While earthquake risk is one of many problems facing Kathmandu Valley and Nepal, given the inevitability of a future destructive earthquake, seismic safety must be incorporated into its development plan.

Constraints and How They Will be Addressed

Constraints to effective vulnerability assessment, planning and implementation of mitigation and preparedness measures in Kathmandu Valley include:

- Skills required to assess the vulnerability and develop a comprehensive approach to the reduction of earthquake risks of Kathmandu Valley are limited.

- There is inadequate development planning coordination between the three municipalities and many public and private institutions involved in the development of lifeline

infrastructure and critical facilities in the valley.

- While there is a basic awareness that earthquakes threaten Kathmandu Valley, there is no technically sound basis that conclusively supports the importance of making disaster mitigation a part of the normal Kathmandu Valley development process or plan to make this so.

- There is no institutionalized central focal point for the coordination and advocacy of disaster mitigation among with the many public and private institutions involved with the components of disaster management.

There are three fundamental and interrelated elements necessary to reduce the earthquake threat in Kathmandu Valley:

1. A technically competent and objective analysis, supported and reviewed by international specialists, of the nature and extent of the earthquake risk facing Kathmandu Valley, and an information center to gather, maintain, and distribute this information. Much of the technical information needed to do this has been undertaken by the National Building Code project and it is critical that the data collected by the project be maintained and disseminated thereby implementing objectives identified including the reduction of the vulnerability of non-engineered structures.

2. A comprehensive set of earthquake hazard mitigation recommendations and identification of resources for their implementation, based on the Kathmandu Valley technical analysis and developed by local and international specialists in government, city planning, urban infrastructure, business and industry, and emergency services.

3. A Disaster Mitigation Council in which government, business, and academic leaders collaborate to foster earthquake hazard mitigation measures and incorporate them into the Kathmandu Valley urban development process.

The approach used in this project intends to address these needs in order to reduce the earthquake vulnerability of Kathmandu Valley.

Goal and Purposes

The goal of this project is to provide direction in reducing the physical, social, and economic consequences of earthquakes to Kathmandu Valley.

The project has three specific purposes:

1. Improve the understanding of Kathmandu Valley's earthquake risk;

2. Contribute to establishment of self-sustaining mechanisms which manage that risk; and

3. Raise the awareness of that risk among the public government officials, development professionals, building artisans and technicians, and business leaders, both within Kathmandu Valley and internationally.

Reducing earthquake risks is a process which takes many years. It requires that development professionals, building artisans and technicians, business leaders, government officials, and the public be convinced that earthquake safety is important relative to the other needs of the community, and that mitigation projects are practical and affordable. This requires time, sustained effort, and direction, the latter of which this project aims to provide.

Intended Results

The purposes of this project will be accomplished in three phases which are planned as follows:

1. An earthquake vulnerability assessment, in which Kathmandu Valley scientists and engineers and technicians work with their international counterparts to evaluate the earthquake vulnerability of the area.

2. A survey of the urban environment including urban services, facilities, and infrastructure, resulting in an earthquake scenario for Kathmandu Valley.

3. Prepare earthquake risk reduction recommendations. The recommendations are developed by a group of international and Nepalese specialists from the fields of business and industry, city government, city planning, emergency services, and infrastructure, who meet to learn about the earthquake threat and develop a framework for an earthquake risk reduction program for Kathmandu Valley. A goal of the process is to develop recommendations for creating a self-sustaining local mechanism (either by strengthening existing institutions or creating a new organization) to assess Kathmandu Valley earthquake hazards, increase earthquake preparedness, and incorporate earthquake disaster mitigation strategies into the Kathmandu Valley urban development process.

It is the achievement of the above overall results which will enable Kathmandu Valley to create and maintain an earthquake risk reduction program for the valley and then extend this to the rest of Nepal.

Twelve key results will be achieved during the course of this project, each related to one of the three phases listed above. Pertaining to evaluating the earthquake vulnerability of Kathmandu Valley, the project will result in:

1. Summary of an earthquake vulnerability assessment of the Kathmandu Valley including plausible future earthquake events and resulting intensities of earthquake shaking as defined by the National Building Code project.

2. Descriptions of urban infrastructure, critical facilities, emergency response organizations, government administration, and business and industry in Kathmandu Valley with an emphasis on earthquake vulnerability. These descriptions will include location, and installation conditions (eg. anchoring and maintenance).

3. An earthquake damage assessment estimating distribution and extent of damage to structures and infrastructure from each of the hypothetical earthquakes.

4. A comprehensive but preliminary description of the possible consequences of a plausible earthquake on Kathmandu Valley (eg. identification of the most vulnerable systems including estimation time to restore services).

In relation to educating key local community, business, and government leaders including artisans about the earthquake threat and methods of risk reduction, the project will result in:

5. A final project report, distributed to government, development professionals, technical and business leaders, including an earthquake hazard and damage assessment, earthquake consequences on Kathmandu Valley, and a comprehensive set of earthquake management reduction projects.

6. In-country workshops attended by international and regional experts to explore alternative approaches to disaster management (eg a presentation by a Disaster Coordinating Council and/or CNDR - the Corporate Network for Disaster Response from the Philippines). This workshop could be held over a series of weeks (3 sessions over two months) in order to give time for participants to complete specified tasks.

7. Earthquake hazard and risk reduction workshops in Kathmandu Valley in which local and international leaders and specialists in government, business, emergency services, urban infrastructure, engineering, and research confer about Kathmandu Valley's earthquake hazards and develop mitigation measures.

Regarding the creation a self-sustaining local mechanism to assess Kathmandu Valley earthquake hazards, increase earthquake preparedness and mitigation, and incorporate earthquake disaster mitigation strategies into the Kathmandu Valley urban development process, the project will result in:

8. Recommendations for the strengthening of the Disaster Mitigation Council to foster earthquake hazard mitigation measures and incorporate earthquake disaster mitigation strategies into the Kathmandu Valley urban development process including but not limited to building code adoption process, inspections; construction rules of thumb, etc).

9. A framework for a multi-year earthquake risk reduction program, reviewed by international technical, government, and business leaders, and given to the Disaster Mitigation Council to manage.

10. A charter for a Business and Industry Council of Emergency Preparedness to foster earthquake hazard mitigation in the private sector.

11. Training of Kathmandu Valley researchers to create earthquake damage assessments for various hypothetical earthquakes.

12. Training for household construction overseers (frequently women) to identify and minimize building vulnerabilities during their construction as well as risks created by poor maintenance of existing structures.

Outcomes (Impact of the proposed activities)

In summary, demonstration project outcomes will be as follows:

1. Hazard, vulnerability and risk assessments of Kathmandu Valley buildings, non-engineered structures, critical facilities and lifeline infrastructure prepared based on likely scenario earthquake.

2. Comprehensive earthquake mitigation program developed and resources for its

implementation identified.

3. Permanent disaster mitigation council of government, business and industry leaders (institutional focal point) established to advocate earthquake safety and preparedness as a part of the normal development process in Kathmandu Valley.

4. Improved awareness and skills among earthquake professionals.

This project will contribute significantly to the knowledge and understanding of earthquake hazards and methods of hazard mitigation of the Offices of the Municipal Governments in Kathmandu Valley, Offices of the National Nepalese Government, the Ministry of Home and the National Ministries of Energy, Development, Trade and Finance, and local scientists, engineers, and businesses. Furthermore, the project in Kathmandu Valley will serve as a model for other threatened cities in Nepal.

The most significant contribution of the Kathmandu Valley Earthquake Risk Reduction Project, however, is that it creates a vehicle by which increasing earthquake safety and preparedness can become a permanent element of the urban development process and more broadly, Kathmandu Valley life. This project not only determines the earthquake hazard based on several hypothetical earthquakes, but also equips the scientific and engineering community with sufficient knowledge and equipment to evaluate earthquake hazards in the future.

The project also provides Kathmandu Valley with a comprehensive set of risk reduction projects, and more importantly equips Kathmandu Valley community leaders to evaluate earthquake hazards and develop mitigation measures themselves.

Lastly, this project provides direction in strengthening a self-sustaining local Disaster Mitigation Council to oversee all aspects of the hazard assessment and mitigation development and implementation process. It is this final step which will result in the benefit of virtually every citizen of Kathmandu Valley, as every step towards earthquake preparedness will save property and lives in the next earthquake.

Opportunities

In recognition of the significant earthquake threat, the Government of Nepal, under the auspices of the UNDP/UNCHS (HABITAT) prepared a National Building Code which includes an implementation strategy and management plan. A workshop was held to identify problems and issues with respect to seismic hazard mitigation. One of the key needs identified was the need to raise awareness about the growing vulnerability in urbanizing areas

in Nepal. The data from the National Building Code project and the identified need for raising public awareness form the basis for continuing with a more detailed evaluation of specific problems in the three municipalities of Kathmandu Valley.

His Majesties Government (HMG) urgently recognizes the need for a long term commitment to disaster mitigation and has worked hard to develop and an overall disaster management policy. However, again it is recognized that the detailed policy, procedures and budgets are not yet in place and that this project would help define specific mitigation program needs for urban areas. As Kathmandu Valley is the key urban government, business and industrial center of Nepal and highly vulnerable to earthquakes, there is keen interest to start there.

As an approach for analyzing mega-cities of Asia, the earthquake scenario approach offers a great deal of promise for replication in other larger mega-cities.

Lead National Institution

The Nepal Society for Earthquake Technology (NSET) is a foundation established within the last several years specifically to address earthquake issues in a multi-disiplinary way. Its members include seismologist, geologists, engineers, architects and planners from key public and private institutions. Therefore is has a natural network of the key actors needed to carry out such a project.

The Nepal Administrative Staff College (NASC) has worked with ADPC for the last three years to develop its capacity as the key disaster training center for Nepal. It has developed several disaster courses and workshops and was instrumental in the development of recommendations for Nepal's national policy on disaster management and disaster management training needs.

Collaborating Organizations

Local: Three Municipal Governments in Kathmandu Valley

National: ____ University
National Planning Board
Ministry of Home
Ministry of Housing and Physical Planning
Ministries of Energy, Development, Trade and Finance

International: International Centre for Integrated Mountain Development (ICIMOD)

Philippines: National Project Description

Project Background/Problem Definition

The Philippines experiences more destructive disasters yearly than almost any other country in the world. Much of the destruction from these disasters affects growing urban areas. In the last several years, there have been great improvements in preparedness planning for relief and response, especially for typhoons. However, little has taken place regarding mitigation of disasters in municipalities, especially for earthquakes and floods. Further, flash flooding in some municipalities is a relatively recent phenomena due to environmental degradation in surrounding rural areas.

Because of yearly typhoons and the recent Mount Pinatubo experience there is a high level of awareness of the problems and impact of disasters. Despite this however, at the municipal level, little is being done to identify existing vulnerabilities or address mitigation as a part of the development process.

Project Justification

The need for vulnerability assessment and mitigation tools at the municipal and community or Barangay level is critical to support healthy economic growth of municipal growth centers identified by the Government of the Philippines (GOP). Such tools will allow public and private development decision makers to consider disaster mitigation strategies as a part of the normal development and investment process.

Presently this opportunity is being missed resulting in a growth of vulnerability along with urban, population and economic growth in the municipalities of the Philippines. This growth in vulnerability in identified municipal and economic growth centers will be accompanied by a growing potential for economic setbacks due to disasters if not checked.

Constraints and How They Will be Addressed

Constraints to making disaster mitigation a component of the municipal development process in the Philippines are:

- Raw data needed to prepare hazard risk maps is available, but an approach must be identified and an effort made to collect and transform this data into information useful to municipalities, Barangays, and both large and small private sector investors for use in preparing vulnerability analyses, preparedness plans, and identifying urban

mitigation strategies.

- Basic skills to use disaster information to evaluate planned investments, vulnerability of existing communities, etc. do not exist at the local level.

- Public and private decision makers at municipal and community levels are not aware of disaster vulnerabilities in existing communities or sectors of their municipalities or of vulnerability implications relative to development investment decisions being made.

- National urban policy does not address or provide incentives for incorporating a consideration of disasters into the municipal development process.

The project will address these constraints by supporting a series of inter-related activities in two adjacent municipalities one region identified by the GOP as economic growth centers. Inputs will include a demonstration project, technical assistance, training, network of disaster mitigation advocates and promotion/public awareness that will result in:

1. the development of the required hazard data into useful information that becomes a part of the municipal GIS;

2. skills training for municipal planners, engineers and decision makers as well as corporate sector planners that will be institutionalized and available to other municipalities with similar vulnerabilities;

3. vulnerability assessments of existing or planned critical facilities or infrastructure such as power utilities, vulnerability assessments of Barangays, etc.;

4. development of cost/benefit analysis of alternative mitigation strategies to planned municipal investments, land use plans, etc.

5. development and use of community level applications for individuals and small business;

6. development of materials that can be used by investors in their investment feasibility analysis and site selection phases;

7. presentations and development of materials that will be used to describe, promote and transfer these processes to other similar municipalities; and

8. policy workshops to promote the development of urban policies and incentives that will encourage making disaster mitigation a part of the normal municipal development process.

Goal and Purposes

The project goal is to reduce vulnerability to natural disasters of residents, infrastructure, critical facilities and shelter as a part of sustainable municipal development in Government of Philippines (GOP) designated economic growth centers.

The purposes of the project are to:

1. improve understanding and awareness of national and local, government and business leaders about the risk, potential consequences, and methods of mitigating flash floods and earthquakes in high risk municipalities and

2. strengthen national and municipal level mechanisms which manage flood and earthquake risk and vulnerability.

The project specifically targets municipalities, Barangays, private sector companies and investors and related national institutions with specific disaster mitigation related mandates and are interested in developing practical methodologies for the application of disaster mitigation strategies. It will broaden and enhance the role of disaster mitigation in the municipal and infrastructure development process, at the community or Barangay level in targeted municipalities and will increase awareness of the importance of disaster mitigation analysis and measures by national policy makers and municipalities with similar vulnerabilities.

The project will compliment and be coordinated with two ongoing USAID Mission projects which are the a) BAYANIHAN: Building Multi-Sectoral Partnerships for Sustainable Disaster Prevention, Mitigation and Preparedness which will be implemented by the Corporate Network for Disaster Response and the b) Decentralized Shelter and Urban Development (DSUD) Project which has supported GIS capability building in municipalities throughout the Philippines that have purchased their own GIS systems for use in their planning process.

Intended Results

1. Hazard Mapping: Prepare three sets of GIS hazard maps for flood and earthquakes

(ground shaking and liquefaction) for Davao, General Santos and southern Region XI.

2. Risk and Vulnerability Assessments: Assess the impact of floods and earthquakes on one or two high priority, municipal critical facilities or lifeline systems, and one proposed urban infrastructure investment project in each city. Prepare a provincial level study to access sources of municipal flooding and another to access earthquake related power supply vulnerabilities. Develop recommendations for a revised land use plan based on the hazards maps.

3. Site Selection Materials for Investors: Develop materials for private sector commercial and infrastructure investors to use to identify less vulnerable investment sites.

4. Barangay Level Preparedness Planning: Develop city wide preparedness plans. Develop several detailed Barangay level preparedness plans for floods and earthquakes. Train other Barangays to use the same methods of developing preparedness plans and assist them in their implementation.

5. National Municipal Vulnerability Assessment: Prepare a generalized assessment survey of the flood and earthquake risk and vulnerability of municipalities in GOP designated growth centers.

6. Awareness Raising: Use the National Municipal Vulnerability Assessment (see above) to identify other municipalities in the Philippines with similar problems and present to them the methodologies and approaches used in Davao and General Santos. Make them aware of specialized training available that will help them utilize these methods in there municipalities. Offer training to the most disaster prone and interested municipalities.

7. Dissemination: Careful documentation of the demonstration project, project economic benefits and the specific methods used will be distributed so that others will easily be able to apply these process. Distribution of this documentation to government, development professionals, business leaders etc. throughout the country to make them aware that such work has been done in the Philippines and how to do it.

8. Policy Awareness: Workshops will be held with appropriate national and municipal institutions to consider the methodologies applied in the demonstration projects and recommendations will be developed for providing incentives for municipalities to use these methodologies.

9. Institutionalization of Fee Based Training Programs: Establish fee based specific fee based disaster mitigation training programs at a national educational institution to make standard coursed available to public and private urban development professionals.

Outcomes (Impact of the proposed activities)

1. Municipal Disaster Coordinating Councils (DCCs) meet regularly to review, and update municipal hazard and vulnerability data.

2. NGOs, Baragays and other local level groups use disaster maps to develop community level preparedness plans and mitigation strategies.

3. Appropriate preparedness and mitigation measures are adopted and used by low-income residents and business of the municipalities.

4. Vulnerability assessment methodologies are adopted by municipalities for public sector planning and zoning of critical facilities and infrastructure.

5. Vulnerability assessment methodologies are adopted by investors, developers and other private sector stakeholders in the industrial/commercial base of the municipality.

6. Other municipalities in the Philippines with similar flood and earthquake vulnerabilities adopt replicate methodologies and strategies of the demonstration project.

7. National policy, procedures and budget process provide incentives for municipal level adoption and replication of methodologies and strategies of the demonstration project.

Opportunities

The demonstration project will be located in the municipalities of Davao and General Santos located adjacent to each other on the Island of Mindanao, in Region XI. See end of this section for chart comparing selected Philippines municipalities disaster risk to vulnerability in terms of population growth.

The demonstration project will build upon the convergence of mitigation and relief/response planning needs for hazard and vulnerability maps needed to develop mitigation strategies and

relief/response preparedness plans. Specific hazard and vulnerability mapping projects will be prepared for Davao and General Santos to serve as models for other municipalities with similar vulnerabilities. These maps would form the key information source and basis for analysis of development needs and related mitigation strategies as well as preparedness plans. Specific, planned municipal investments will be evaluated for vulnerability to disaster using the mapped information. From this, mitigation strategies would be considered to reduce vulnerabilities. These strategies would be evaluated in terms of costs and long term benefits relative to the risk that the investment or infrastructure system being considered would be damaged by a disaster.

The project would support the development of a network of institutions and municipal level organizations that advocate disaster mitigation in order to document projects and to exchange information and ideas for the promotion and dissemination of disaster mitigation models, strategies and policies appropriate for municipal development in the Philippines.

Training Programs based on ADPC provided core courses would be developed by Local Government Academy (LGA) and University of Philippines (UP), School of Urban Planning to set up national professional development programs for public, private and NGO's development professionals. Individuals from participating municipalities would be the first to attend. Courses will then be offered on a fee basis to other interested individuals from municipalities, NGO's etc. To broaden interest to other municipalities, short one to three day national awareness raising workshops could be held for individuals from NGO's and development planners from other municipalities with similar vulnerabilities. National policy seminars could also be held to discuss the municipal development policy implications of lessons learned from the demonstration project. At the regional level, workshops would be held to further broaden the experience and interchange of approaches among the 5 other countries participating in the AUDMP. Further, the project will support the development of practical how-to "workbooks" that will present a step by step approach to the various mitigation strategies demonstrated by each pilot project including cost benefit analysis.

Economic Growth Centers: Following a long period of slow economic growth, the Philippines has started to enjoy a 4-5.5% annual growth rate which is expected to increase given the directions of it's new democratic government and a decentralization of power to local authorities. The GOP has recently developed a strategy of encouraging growth in prioritized "economic growth centers" that demonstrate strong growth potential. Examples of these are the development and conversion of former US military facilities, the CALABARZON Industrial Area which supports industrialization and expansion of growth around Metro Manila, support of growth in Metro-Cebu whose economic growth rate is higher than that of the capital city of Manila, the Benguet-Pangasinan-Ilocos Development Program

in which Dagupan and Baguio play a major role, and the support of economic growth in Davao and General Santos in Mindanao (Region XI) which are participating in the East ASEAN Growth Polygon in cooperation with the northern islands of Indonesia, Malaysia and Brunei. A consideration of natural disasters which can suddenly setback such economic growth if mitigation strategies are not a part of the planning process should be a component of the development of cities in these growth areas.

Use of GIS: Recently, a number of municipalities including Davao, General Santos and others have acquired or plan to acquire with their own funds Geographical Information Systems (GIS) to use as urban management tools. Most cities want to include disaster information in these systems that can be used in making development investment decisions as well as aid in the development of city wide and Barangay level preparedness plans.

Municipal Level Disaster Management Councils: Both Davao and General Santos have established Disaster Coordinating Councils (DCCs) chaired by their Mayor and consisting of the municipal planners, engineers and housing officers, city search and rescue teams, disaster related NGO's and private businesses. The Mindanao Network for Disaster Response (MNDR) is a member of both councils. It was established in Region XI as a local level extension of the Corporate Network for Disaster Response (CNDR). MNDR consists of community business leaders from companies such as San Miguel Corp., Davao Light and Power Co., Del Monte, Philippines, Dole Philippines, JVA Management Corp., STANFILCO, UCPB Foundation, etc.

Lead National Institutions

The Philippines Institute of Volcanology & Seismology (PHIVOLCS) has become the key advocate for disaster preparedness and mitigation activities in the Philippines. A recent workshop organized by PHIVOLCS with funding from PHIVOLCS, UNDP, ADB, USAID and others illustrates this point. The workshop offered municipal and provincial government official, planners and engineers presentations that gave an overview of preparedness and mitigation from key national experts. The workshop centered around resources, institutions and individuals that offer municipalities the capability to prepare their own hazard maps, vulnerability and risk assessments, and then identify and implement mitigation measures as a part of their development process. PHIVOLCS is the only institution in the Philippines that has the stature and network to be able to implement a disaster mitigation demonstration project at the municipal level.

Local Government Academy (LGA) and University of Philippines (UP), School of Urban Planning jointly are proposed as the institutions that would provide training with inputs

from ADPC's core regional training of trainers courses.

PHIVOLCS, LGA/UP, MNDR and Davao General Santos municipal governments and will prepare a detailed project proposal based on AUDMP proposal guidelines. Proposals will be prepared by local consultants with support from the ADPC PMT. The proposal will be reviewed by the AUDMP Project Steering Committee to ensure that it complies with program guidelines (see annexes). Once a proposal meets all requirements, sub-contracts will be developed between the ADPC, PHIVOLCS and LGA/UP. The proposal will also be reviewed by the USAID Mission in order to maximize overlaps and opportunities for collaboration between this and other related mission programs (see above). PHIVOLCS will then implement and manage the demonstration project and LGA/UP will implement and manage the training component . ADPC and other international specialists will provide technical and training inputs where needed.

Collaborating Organizations

Local:
Davao and General Santos Local Governments
Barangay Leaders and NGO's of Davao and General Santos
Mindanao Network for Disaster Response (MNDR) (a CNDR affiliate)
Provincial Government
NEDA Region XI Office
NGO's

National:
CNDR (Corporate Network for Disaster Response)
University of Philippines (School of Urban Planning)
Local Government Academy
League of Cities
League of Governors
NEDA National Office
NAMRIA

The following chart, indicates the disaster risk for selected municipalities for a variety of disaster types and potential vulnerability as indicated by the population at risk and the projected growth rate.

City	Province	Reg	Disaster Risk VOL	EQ	LS	TSU	TY	FL	Population 1994	Population 2010	Growth Rate
Davao (metro)	Davao del Norte	XI	M	H	L	M	L	H	980,000	1,508,000	3.37%
General Santos	South Cotabato	XI	H	H	M	H	L	H	230,000	348,000	3.20%
Lipa	Batangas	IV	H	H	M	L	L	L	171,000	248,000	2.80%
Legaspi	Albay Province	V	H	H	M	L	H	H	123,000	177,000	2.74%
Naga	Camarines Sur	V	L	H	M	L	H	H	126,000	173,000	2.37%
Cebu	Cebu	VII	-	M/H	M	M	M	M	664,000	899,000	2.21%
Dagupan (metro)	Pangasinan	I	L	H	-	M/H	H	H	273,000	369,000	2.20%
Batangas	Batangas	IV	M	M	M	M/H	M/H	H	176,000	225,000	1.74%
Cagayan de Oro	Bukidnon	X	L	H	M	H	L	H	343,000	421,910	1.44%
Bacolod	Negros Occidental	VI	M	H	-	M/H	M	H	318,000	364,000	0.90%
Ormoc	Leyte Province	VIII	L	H	M	M	H	H	129,000	131,000	0.10%
San Fernando	Pampanga Province	III	H	M	-	L	H	H			

Legend: VOL - volcano; EQ - earthquake; LS - landslide; TSU - tsunami; TY - typhoon; FL - flood

mitigation strategies.

- Basic skills to use disaster information to evaluate planned investments, vulnerability of existing communities, etc. do not exist at the local level.

- Public and private decision makers at municipal and community levels are not aware of disaster vulnerabilities in existing communities or sectors of their municipalities or of vulnerability implications relative to development investment decisions being made.

- National urban policy does not address or provide incentives for incorporating a consideration of disasters into the municipal development process.

The project will address these constraints by supporting a series of inter-related activities in two adjacent municipalities one region identified by the GOP as economic growth centers. Inputs will include a demonstration project, technical assistance, training, network of disaster mitigation advocates and promotion/public awareness that will result in:

1. the development of the required hazard data into useful information that becomes a part of the municipal GIS;

2. skills training for municipal planners, engineers and decision makers as well as corporate sector planners that will be institutionalized and available to other municipalities with similar vulnerabilities;

3. vulnerability assessments of existing or planned critical facilities or infrastructure such as power utilities, vulnerability assessments of Barangays, etc.;

4. development of cost/benefit analysis of alternative mitigation strategies to planned municipal investments, land use plans, etc.

5. development and use of community level applications for individuals and small business;

6. development of materials that can be used by investors in their investment feasibility analysis and site selection phases;

7. presentations and development of materials that will be used to describe, promote and transfer these processes to other similar municipalities; and

8. policy workshops to promote the development of urban policies and incentives that will encourage making disaster mitigation a part of the normal municipal development process.

Goal and Purposes

The project goal is to reduce vulnerability to natural disasters of residents, infrastructure, critical facilities and shelter as a part of sustainable municipal development in Government of Philippines (GOP) designated economic growth centers.

The purposes of the project are to:

1. improve understanding and awareness of national and local, government and business leaders about the risk, potential consequences, and methods of mitigating flash floods and earthquakes in high risk municipalities and

2. strengthen national and municipal level mechanisms which manage flood and earthquake risk and vulnerability.

The project specifically targets municipalities, Barangays, private sector companies and investors and related national institutions with specific disaster mitigation related mandates and are interested in developing practical methodologies for the application of disaster mitigation strategies. It will broaden and enhance the role of disaster mitigation in the municipal and infrastructure development process, at the community or Barangay level in targeted municipalities and will increase awareness of the importance of disaster mitigation analysis and measures by national policy makers and municipalities with similar vulnerabilities.

The project will compliment and be coordinated with two ongoing USAID Mission projects which are the a) BAYANIHAN: Building Multi-Sectoral Partnerships for Sustainable Disaster Prevention, Mitigation and Preparedness which will be implemented by the Corporate Network for Disaster Response and the b) Decentralized Shelter and Urban Development (DSUD) Project which has supported GIS capability building in municipalities throughout the Philippines that have purchased their own GIS systems for use in their planning process.

Intended Results

1. Hazard Mapping: Prepare three sets of GIS hazard maps for flood and earthquakes

(ground shaking and liquefaction) for Davao, General Santos and southern Region XI.

2. Risk and Vulnerability Assessments: Assess the impact of floods and earthquakes on one or two high priority, municipal critical facilities or lifeline systems, and one proposed urban infrastructure investment project in each city. Prepare a provincial level study to access sources of municipal flooding and another to access earthquake related power supply vulnerabilities. Develop recommendations for a revised land use plan based on the hazards maps.

3. Site Selection Materials for Investors: Develop materials for private sector commercial and infrastructure investors to use to identify less vulnerable investment sites.

4. Barangay Level Preparedness Planning: Develop city wide preparedness plans. Develop several detailed Barangay level preparedness plans for floods and earthquakes. Train other Barangays to use the same methods of developing preparedness plans and assist them in their implementation.

5. National Municipal Vulnerability Assessment: Prepare a generalized assessment survey of the flood and earthquake risk and vulnerability of municipalities in GOP designated growth centers.

6. Awareness Raising: Use the National Municipal Vulnerability Assessment (see above) to identify other municipalities in the Philippines with similar problems and present to them the methodologies and approaches used in Davao and General Santos. Make them aware of specialized training available that will help them utilize these methods in there municipalities. Offer training to the most disaster prone and interested municipalities.

7. Dissemination: Careful documentation of the demonstration project, project economic benefits and the specific methods used will be distributed so that others will easily be able to apply these process. Distribution of this documentation to government, development professionals, business leaders etc. throughout the country to make them aware that such work has been done in the Philippines and how to do it.

8. Policy Awareness: Workshops will be held with appropriate national and municipal institutions to consider the methodologies applied in the demonstration projects and recommendations will be developed for providing incentives for municipalities to use these methodologies.

9. Institutionalization of Fee Based Training Programs: Establish fee based specific fee based disaster mitigation training programs at a national educational institution to make standard coursed available to public and private urban development professionals.

Outcomes (Impact of the proposed activities)

1. Municipal Disaster Coordinating Councils (DCCs) meet regularly to review, and update municipal hazard and vulnerability data.

2. NGOs, Baragays and other local level groups use disaster maps to develop community level preparedness plans and mitigation strategies.

3. Appropriate preparedness and mitigation measures are adopted and used by low-income residents and business of the municipalities.

4. Vulnerability assessment methodologies are adopted by municipalities for public sector planning and zoning of critical facilities and infrastructure.

5. Vulnerability assessment methodologies are adopted by investors, developers and other private sector stakeholders in the industrial/commercial base of the municipality.

6. Other municipalities in the Philippines with similar flood and earthquake vulnerabilities adopt replicate methodologies and strategies of the demonstration project.

7. National policy, procedures and budget process provide incentives for municipal level adoption and replication of methodologies and strategies of the demonstration project.

Opportunities

The demonstration project will be located in the municipalities of Davao and General Santos located adjacent to each other on the Island of Mindanao, in Region XI. See end of this section for chart comparing selected Philippines municipalities disaster risk to vulnerability in terms of population growth.

The demonstration project will build upon the convergence of mitigation and relief/response planning needs for hazard and vulnerability maps needed to develop mitigation strategies and

relief/response preparedness plans. Specific hazard and vulnerability mapping projects will be prepared for Davao and General Santos to serve as models for other municipalities with similar vulnerabilities. These maps would form the key information source and basis for analysis of development needs and related mitigation strategies as well as preparedness plans. Specific, planned municipal investments will be evaluated for vulnerability to disaster using the mapped information. From this, mitigation strategies would be considered to reduce vulnerabilities. These strategies would be evaluated in terms of costs and long term benefits relative to the risk that the investment or infrastructure system being considered would be damaged by a disaster.

The project would support the development of a network of institutions and municipal level organizations that advocate disaster mitigation in order to document projects and to exchange information and ideas for the promotion and dissemination of disaster mitigation models, strategies and policies appropriate for municipal development in the Philippines.

Training Programs based on ADPC provided core courses would be developed by Local Government Academy (LGA) and University of Philippines (UP), School of Urban Planning to set up national professional development programs for public, private and NGO's development professionals. Individuals from participating municipalities would be the first to attend. Courses will then be offered on a fee basis to other interested individuals from municipalities, NGO's etc. To broaden interest to other municipalities, short one to three day national awareness raising workshops could be held for individuals from NGO's and development planners from other municipalities with similar vulnerabilities. National policy seminars could also be held to discuss the municipal development policy implications of lessons learned from the demonstration project. At the regional level, workshops would be held to further broaden the experience and interchange of approaches among the 5 other countries participating in the AUDMP. Further, the project will support the development of practical how-to "workbooks" that will present a step by step approach to the various mitigation strategies demonstrated by each pilot project including cost benefit analysis.

Economic Growth Centers: Following a long period of slow economic growth, the Philippines has started to enjoy a 4-5.5% annual growth rate which is expected to increase given the directions of it's new democratic government and a decentralization of power to local authorities. The GOP has recently developed a strategy of encouraging growth in prioritized "economic growth centers" that demonstrate strong growth potential. Examples of these are the development and conversion of former US military facilities, the CALABARZON Industrial Area which supports industrialization and expansion of growth around Metro Manila, support of growth in Metro-Cebu whose economic growth rate is higher than that of the capital city of Manila, the Benguet-Pangasinan-Ilocos Development Program

in which Dagupan and Baguio play a maior role, and the support of economic growth in Davao and General Santos in Mindanao (Region XI) which are participating in the East ASEAN Growth Polygon in cooperation with the northern islands of Indonesia, Malaysia and Brunei. A consideration of natural disasters which can suddenly setback such economic growth if mitigation strategies are not a part of the planning process should be a component of the development of cities in these growth areas.

Use of GIS: Recently, a number of municipalities including Davao, General Santos and others have acquired or plan to acquire with their own funds Geographical Information Systems (GIS) to use as urban management tools. Most cities want to include disaster information in these systems that can be used in making development investment decisions as well as aid in the development of city wide and Barangay level preparedness plans.

Municipal Level Disaster Management Councils: Both Davao and General Santos have established Disaster Coordinating Councils (DCCs) chaired by their Mayor and consisting of the municipal planners, engineers and housing officers, city search and rescue teams, disaster related NGO's and private businesses. The Mindanao Network for Disaster Response (MNDR) is a member of both councils. It was established in Region XI as a local level extension of the Corporate Network for Disaster Response (CNDR). MNDR consists of community business leaders from companies such as San Miguel Corp., Davao Light and Power Co., Del Monte, Philippines, Dole Philippines, JVA Management Corp., STANFILCO, UCPB Foundation, etc.

Lead National Institutions

The Philippines Institute of Volcanology & Seismology (PHIVOLCS) has become the key advocate for disaster preparedness and mitigation activities in the Philippines. A recent workshop organized by PHIVOLCS with funding from PHIVOLCS, UNDP, ADB, USAID and others illustrates this point. The workshop offered municipal and provincial government official, planners and engineers presentations that gave an overview of preparedness and mitigation from key national experts. The workshop centered around resources, institutions and individuals that offer municipalities the capability to prepare their own hazard maps, vulnerability and risk assessments, and then identify and implement mitigation measures as a part of their development process. PHIVOLCS is the only institution in the Philippines that has the stature and network to be able to implement a disaster mitigation demonstration project at the municipal level.

Local Government Academy (LGA) and University of Philippines (UP), School of Urban Planning jointly are proposed as the institutions that would provide training with inputs

from ADPC's core regional training of trainers courses.

PHIVOLCS, LGA/UP, MNDR and Davao General Santos municipal governments and will prepare a detailed project proposal based on AUDMP proposal guidelines. Proposals will be prepared by local consultants with support from the ADPC PMT. The proposal will be reviewed by the AUDMP Project Steering Committee to ensure that it complies with program guidelines (see annexes). Once a proposal meets all requirements, sub-contracts will be developed between the ADPC, PHIVOLCS and LGA/UP. The proposal will also be reviewed by the USAID Mission in order to maximize overlaps and opportunities for collaboration between this and other related mission programs (see above). PHIVOLCS will then implement and manage the demonstration project and LGA/UP will implement and manage the training component . ADPC and other international specialists will provide technical and training inputs where needed.

Collaborating Organizations

Local:
Davao and General Santos Local Governments
Barangay Leaders and NGO's of Davao and General Santos
Mindanao Network for Disaster Response (MNDR) (a CNDR affiliate)
Provincial Government
NEDA Region XI Office
NGO's

National:
CNDR (Corporate Network for Disaster Response)
University of Philippines (School of Urban Planning)
Local Government Academy
League of Cities
League of Governors
NEDA National Office
NAMRIA

The following chart, indicates the disaster risk for selected municipalities for a variety of disaster types and potential vulnerability as indicated by the population at risk and the projected growth rate.

City	Province	Reg	Disaster Risk VOL	EQ	LS	TSU	TY	FL	Population 1994	Population 2010	Growth Rate
Davao (metro)	Davao del Norte	XI	M	H	L	M	L	H	980,000	1,508,000	3.37%
General Santos	South Cotabato	XI	H	H	M	H	L	H	230,000	348,000	3.20%
Lipa	Batangas	IV	H	H	M	L	L	L	171,000	248,000	2.80%
Legaspi	Albay Province	V	H	H	M	L	H	H	123,000	177,000	2.74%
Naga	Camarines Sur	V	L	H	M	L	H	H	126,000	173,000	2.37%
Cebu	Cebu	VII	-	M/H	M	M	M	M	664,000	899,000	2.21%
Dagupan (metro)	Pangasinan	I	L	H	-	M/H	H	H	273,000	369,000	2.20%
Batangas	Batangas	IV	M	M	M	M/H	M/H	H	176,000	225,000	1.74%
Cagayan de Oro	Bukidnon	X	L	H	M	H	L	H	343,000	421,910	1.44%
Bacolod	Negros Occidental	VI	M	H	-	M/H	M	H	318,000	364,000	0.90%
Ormoc	Leyte Province	VIII	L	H	M	M	H	H	129,000	131,000	0.10%
San Fernando	Pampanga Province	III	H	M	-	L	H	H			

Legend: VOL - volcano; EQ - earthquake; LS - landslide; TSU - tsunami; TY - typhoon; FL - flood

Sri Lanka: National Project Desription

Part I. Rainfall Induced Hazard Mitigation Project (RIHMP)

Introduction/Project Background/Problem Definition

Heavy rainfall and serious flooding is an annual occurrence in Sri Lanka. The implications of this flooding are displacement of thousands of families, as well as the creation of severe secondary hazards such as contamination of the water bodies and landslides. Such flooding and contamination not only results in extensive life loss, large number of homeless families, but also in severe health consequences through contamination of drinking water sources.

Develop a monitoring capability and management structure to reduce risks from heavy rainfall including hazard reduction from flooding, landslides and water pollution/contamination. This capability will be achieved through utilization of mapped hazard data, as correlated with underlying socio-economic variables and implemented through strengthened institutional management capacities. Improved management refers to government (national, district, and local levels) and to strengthened private sector commitment to mitigating the hazards.

Constraints

- No organizations exists for formally managing disasters including hazard reduction. The Central Environmental Authority has authority for managing environmental conditions, however the institutional structure for monitoring, and for mitigation of environmental conditions leading to disasters e.g. flooding, contamination, landslides is not yet in place.

- Hazard mitigation is viewed as a separate activity from environmental issues, and is rarely integrated into their planning.

- Integrated disaster management information system with linkages from the central to the local levels needs considerable institutionalization and support.

- Inadequate resources (staffing, skills, and finances) are available to monitor and mitigate hazard reduction on a sustained basis

- There is little or no participation by the private sector in hazard management/risk

reduction

- A very low (negligible) level of community awareness exists with respect to options for hazard mitigation

Summary Project Component Description

In order to address the above issues a national project is proposed with two distinct components addressing various aspects of the overall issues:

1. Landslide Hazard Reduction Project

   - Establish a monitoring program
   - Implement low cost mitigation measures
   - Integration of hazard maps into risk analysis for landslide areas
   - Establish local capability to sustain monitoring efforts and implementation strategies through public and private sectors

2. Flood Hazard Pollution Reduction Project

   - Integration of flood data into risk analysis for catchment area
   - Establish monitoring program (flood flow and water quality)
   - Develop national capability to manage and implement a regional flood hazard reduction program for an entire catchment basin
   - Strengthen private sector participation and promote joint public and private sector planning and implementation

Part II. Management Plan for Lower Kelani River Catchment Area

Project Background/Problem Definition

The largest concentration of population in the Kelani River (or "Ganga") basin occurs in and around the city of Colombo. Pressure for new land is great, and the city is expanding inland on both sides of the river, where new housing and industrial developments are evident. Coupled with this high level of development are low-cost housing and slum developments, for example, bordering the Colombo drainage canal system, and on low-lying land adjacent to the Kelani Ganga.

The present population within the boundaries of the Colombo Municipal Council is 611,000 (1991), and is predicted to increase to 649,000 by the year 2002. The Colombo Urban Area, has a present population of 2,093,000 and is forecast to increase to 2,613,000 by 2002. (Source: Dept. of Census and Statistics)

The Kelani River supplies approximately 80% of the drinking water requirements for Sri Lanka's largest city, the Greater Colombo area. River waters are used for a variety of additional purposes including navigation in its upper reaches, hydroelectric power generation, and industrial uses. A number of polluting industries which discharge industrial effluents already exist in the vicinity of this river. In addition, applications are being received by the Regulatory Authorities for the siting of new, highly polluting and effluent generating types of industry.

Two related sets of issues have been identified for the Kelani River:

- water flow (flood and drought conditions)
- water quality

Water Flow: During the rainy season the Kelani Ganga floods every year. Ancillary problems caused by the flooding are displacement of numerous of housing units and (the greater issue) overflow of septic tanks, with the wastes then dispersed by flood waters.

Floods in the Kelani River basin originate from heavy precipitation in the mountainous upper region of the basin, and converge at the last major confluence, the Sitawaka River, located just upstream of the Glencorse gauging station. Downstream from this point, the river valley widens, and major floods overtop the banks and spill onto adjacent lands, causing widespread inundation. Earlier this century, a spate of major flooding occurred, with eight major floods recorded during the 13 year period 1927-1940. The highest flood on record took place in August 1947, while the most recent major flood occurred in June 1989. During these most recent floods, a large part of the Kelani River valley was inundated, including all of the area covered by the Minor Flood Protection (MFP) schemes. Colombo and the right bank area did not sustain flood damages although the Right Bank Bund was close to overtopping in several locations.

Water Quality: The quality of river water at the intake, particularly during the dry season, has been a prime concern for the Sri Lanka National Water Supply and Drainage Board (NWSDB). Although the intake is located at Ambatale, 15 kms. from the river mouth, high salinity levels have been detected in its vicinity. The problem is exacerbated by the ongoing removal of large quantities of sand from the river bed, which has resulted in the

serious degradation of the lower reaches of the Kelani River. Future water abstraction rates and further sand mining are both expected to contribute to deterioration of water quality.

When the water flow in the river is low, the required dilution of the effluents from the industries which are acceptable during normal flow does not occur. This situation is worsened by salinity intrusion into the intake at Ambatale.

Another water quality issue concerns the discharge of industrial and domestic sewage effluent into the river, which affects the oxygen balance and general water quality in the estuary.

Project Justification

A water quality study including hydrological modeling of the lower reaches of the Kelani Ganga was carried out by the Danish Hydraulic Institute in association with the Lanka Hydraulic Institute under the direction of the NWSDB.

The problem is that, although hazard data is available no single government agency has overall responsibility for the entire catchment area; and since the condition of the river (flooding and environmental contamination) is the result of a wide number of interrelated factors, remedial actions have not been coordinated. A management plan for the entire catchment area is therefore needed.

These projects that are undertaken address problems on a piecemeal basis with no integrated management strategy that also addresses the root causes. Without a metropolitan-wide framework the separate remedial projects for upgrading and construction of drainage and flood control lack effectiveness.

This new plan must include a range of incentives and a detailed land zoning plan with an overlay of the flood hazard including impact of storage of hazardous materials, that includes toxic and industrial waste, as well as raw sewage.

Goal and Purposes

The importance of the Kelani River, and the threats to the river system, have been widely recognized. For example, the Dutch government has funded a water quality model and 3 pilot wastewater systems. UNIDO has a project for waste minimization. The World Bank has signed an agreement to give soft loans (1%) to industrialists for pollution control. In addition, a pollution control abatement fund operated by the National Development Bank

has been established with seed money provided by Germany. Lack of an overall management structure has made it impossible for the Government of Sri Lanka (GSL) to prioritize the issues which need to be addressed with respect to upgradation, to ensure their coordination and to monitor any progress which is being made.

The goal of the proposed Project is to enhance the capability of the GSL to reduce the effects of flooding and water pollution of the Kalani River which is the major water supply source for the greater Colombo metropolitan area.

The specific purposes of the activities (inputs) are two fold:

1. to establish a framework for a comprehensive management strategy to reduce degradation of water quality, to regulate flows and reduce flood and drought conditions; and

2. to establish two systems - one to monitor changes in river levels and the second to monitor water quality, including salinity intrusion as well as toxic releases and resultant contamination.

The Kelani Ganga has been declared a protected area and is so designated in the Environmental Act. Realization of the objectives of this designation can only be realized when the Central Environmental Authority has the capability to monitor, enforce and, eventually, develop standards for upgrading (retrofitting) of existing structures.

1. Develop a series of updatable GIS base maps (digitizing existing data) with the following components:

   - flood way and flood plain as defined through hydrological modeling

   - residential land use including but not limited to the following components
     - sand extraction zones (existing and proposed)
     - industrial siting zones (existing and proposed)
     - permitted uses within the upper forested areas

   - other - to be defined during the project

2. Develop an environmental management system to institutionally sustain the framework for management of environmental problems within the Kalani Watershed. This will have the following components:

- an environmental information and analysis system for purposes of modelling and creation of an environmental database relating to geographic information.

- a basic and primary analysis of environmental resources made available to the municipality.

- an early warning and monitoring capability.

3. Develop project review criteria and procedures for the entire catchment area, so that private and public contractors as well as government (national, municipal) decision makers can assess the reciprocal impacts of one action upon the others. These impacts will include strategies to reduce flooding, salinity intrusion, and pollution. This framework will be an important mechanism to define remedial priorities and to coordinate activities.

Intended Results

1. Based on the GIS capability a management framework will be proposed evaluating the impacts of development actions on the water flow volumes and water quality of the Kelani River. An institutional mechanism to administer the entire catchment basin will also be proposed.

2. Prepare staffing structure including requisite skills for the Environmental Division to implement the Kelani Ganga Protection District.

3 Define water quality standards which will be applied prior to issuing industrial operations licenses and develop a schedule for phased compliance with standards by existing industries including retrofit requirements.

4. Establish a monitoring unit within the CEA for water quality control and flood forecasting system. The unit will include:

- Data collection systems (flood and water quality)
- Data transmission systems
- A flood forecasting tool, (mathematical) model
- Acquisition of monitoring equipment and training of staff

(Note: Presently, 14 rainfall stations are in operation in the Kelani Ganga Basin. Thirteen of these stations collect daily totals of rainfall only, while at

one station (Norton) rainfall is recorded hourly.)

5. Develop guidelines for land use decision-making and interactive (cumulative impact) analysis, with the UDA utilizing the GIS maps.

6. Develop educational and training materials explaining water quality issues in the Ganga River basin. The materials will consist of manuals that can be used as a training tool for new CEA employees, and for industrialists who must comply with the new regulations.

7. Develop a manual for evaluation of proposal actions including criteria and possible mitigations measures.

8. Prepare a video, "The River" for use in schools and throughout the community.

Outcomes (Impact of proposed activities)

1. An integrated Institutional mechanism to coordinate and manage the entire catchment.

2. GIS capability to monitor, evaluate and make impact assessments.

3. Water standards that apply to licensing new industry and retrofitting existing ones.

4. A effective Monitoring Unit for water quality testing and flood forecasting.

5. Guidelines for zoning and land use decision-making.

6. Educational and training materials for staff, industry and the community.

7. A manual with guidelines and criteria for water quality and flood forecasting.

8 A video entitled "The River" for educational and motivational use.

Lead National Institution

The implementing institution will be the Central Environmental Authority (CEA). A Technical Committee composed of members from the National Water Supply & Drainage Board (NWSDB), Ceylon Institute of Scientific & Industrial Research (CISIR), National Aquatic Resources Agency (NARA), National Building Research Organization (NBRO), and

the Board of Investment (BOI) will advise the CEA.

Part III. Landslide Risk Reduction Project for Sri Lanka

Project Background/Problem Definition

Sri Lanka has a land area of 65,000 sq. km. of which nearly 67% is flat, 11% "rolling", 21% "hilly and mountainous", and 1% extremely steep. Landslides occur on slope which are generally, but not always, steep, where there is already some degree of instability. Hence, landslides are most common in the central hill country of Sri Lanka, which is considered to be land over 300 meters above MSL. Disastrous landslides have, however, occurred in the relatively low hills (150 m above MSL) of the Agalawatte area of the south-west in 1984. Hence, it must be assumed that landslide susceptibility is spread over the 33% of the country that is not flat.

Rainfall, especially intense rainfall, is the triggering factor in bringing about the occurrence of landslides and other mass movements including earth flows, debris flows and earth slides, the boundaries of which are modulated by old gullies which tend to confine the moving mass. In Sri Lanka, the highest rainfalls exceeding 100-150 mm occur in the southwestern sector of the island, known as the Wet Zone; however, the Intermediate Zone also experiences high rainfall.

Recent peaks of landslide activity have occurred in January 1986, again in May and June 1989, and most recently in October 1993. The January 1986 landslide event claimed 51 lives and rendered nearly 10,000 families homeless. A little over three years later in May and June 1989, the landslides surpassed the 1986 events in severity and magnitude, claiming more than 300 lives. The number of homeless was never calculated. The full impacts of the 1993 event were not calculated.

In addition to direct life and property losses, landslides have caused severe environmental and socio-economic impacts. Environmental impacts have included soil erosion, increased sedimentation, flooding, impacts on agriculture, and damage to forest cover and wildlife. Socio-economic impacts have included communication and transportation route disruption, as well as changes in settlement patterns.

Project Justification

The demonstrated threat of landslides in Sri Lanka resulted in funding by UNDP of a

five-year program by to identify and map landslide-prone areas. Landslide hazard maps are essential for assessments of damage potential and qualification of risks.

The maps produced by the project cover a total of 12,000 sq. km. in two of the 7 districts determined to be susceptible to landslides (Nuwara Elija and Badulla). The graded landslide hazard maps serve as tools for planning of settlement and infrastructure development in the hill country of Sri Lanka. The UNDP project did not, however, include a component which would institutionalize the capability to mitigate landslide damages, nor support the extension of mapping to Kegalle and Ramapura districts.

Goal and Purposes

The goal of the project is to link previously undertaken hazard maps with early warning and mitigation opportunities; to improve awareness of the plantation sector and inhabitants in affected areas; and to encourage the adoption of effective policies to prevent their occurrence.

The purposes of the project are to:

1. develop an early warning system in the vulnerable communities and plantation sector by establishing monitoring techniques;

2. increase the understanding of measures which can be taken to prevent landslides and to protect areas which are potentially vulnerable to their occurrence; and

3. develop an implementation framework and strategies for utilization of landslide risk reduction techniques, including measures which utilize hazard maps and instrumentation.

The project will develop a utilization program designed to guide land use and capital investments to reduce the occurrence of landslides, mitigate their effects when they occur, and develop a preparedness capability at the local, district and national levels. A landslide hazard reduction program will be designed which consists of two components:

1. a framework for enhanced monitoring and mitigation capability; and

2. institutional strengthening.

Civil engineering concepts pertaining to monitoring, warning, drainage control,

retainage, etc., are widely used to reduce the occurrence of landslides in developed areas. These concepts will be explored in relation to the application of appropriate technology, including use of traditional materials and techniques.

Intended Results

1. Monitoring and Mitigation Capability :

1.1. Identify monitoring techniques

- use of rain gauges
- moisture/saturation monitoring
- soil movement rate and direction
- other-to be defined during the project

1.1.2. Establish early warning plan including local preparedness procedures based on monitored indicators

1.2. Damage Prevention-Mitigation

1.2.1. Define techniques mitigating to drainage issues

- channelization of water
- flow direction and rate
- other-to be defined during the project

1.2.2. Define construction practices of drainage systems using local materials, e.g.bamboo

1.2.3. Prepare guidelines pertaining to earth cuts and fills

- slope gradient
- earthen buttresses
- natural buttresses (alternative concepts)
- direction of appropriate (and in appropriate) terracing and other cutting and filling practices
- other-to be developed during the projects

1.3. Monitoring

1.3.1. An illustrated manual will be prepared which illustrates the monitoring and mitigation concepts listed under inputs. It will define the specific problems addressed and will also illustrate step by step construction procedures. The manual will be available for use by district level administrators, local authorities, and in technical schools. In order to maximize its educational utility the manual will also contain a section analyzing the landslide hazard maps prepared by NBRO in relation to the underlying community risk.

1.3.2. The monitoring and mitigation concepts will also be demonstrated in one or two designated landslide prone communities. These constructed examples will serve as demonstration examples of monitoring measures and appropriate damage reduction techniques.

1.3.3. During the construction process a video will be prepared in order to further refine the understanding of why and how to mitigate landslide risks.

1.3.4. Undertake workshops to use the materials.

1.3.5. Prepare an administrative structure of the local and national level to implement the monitoring and early warning program (including evacuation procedures if necessary).

2. Institutional Strengthening:

2.1. A multi-sectoral strategy will be developed which can be implemented at the national, district and local levels to ensure that existing landslide hazard maps are utilized for risk reduction in conjunction with human settlement and capital investment policies.

2.1.1. A multi-sectoral improved capability will be established to understand the implications of the landslide hazard and identify measures to adopt mitigation, e.g. through environmental assessment, land use and transportation planning, and construction monitoring capability.

2.1.2. Multi-sectoral also includes means to strengthen private sector initiatives, and public sector capabilities, e.g., in construction of capital projects such as roadways, in commercial rubber and tea company plantations, and in land-use planning and zoning by local authorities.

2.2. Institutional

2.2.1 Draft a prototype section for inclusion in the National Environmental Act for geotechnical impacts on land stability.

2.2.2 Prepare criteria for use by reviewing ministries when evaluating projects for potential impacts. In addition to criteria pertaining to potential impacts range of potential measures will be defined to mitigate landslide vulnerability which could be incorporated into environmental assessments (EIA's) for use by Ports, Transportation and other ministries and donors undertaking major capital projects. In addition, incentive tools and mechanisms will be defined which government may require and/or project builders can include for landslide prevention.

2.2.3 Develop guidelines and criteria which can be used by private sectors in plantation that ensure compliance with prevention of soil erosion and the location and construction of infrastructure facilities.

2.2.4 Develop guidelines and criteria which can be used in conjunction with the HG program to ensure that homes will are located, and constructed (including site preparation) in compliance with criteria which comply with landslide hazard reduction criteria.

2.2.5 Work with local Thrift Societies and School Societies to establish local networks which understand the importance of landslide prevention.

2.2.6 Strengthening local and district capabilities in the use of hazards mapping to develop land zoning and hazard free land use planning.

2.2.7 Reproduce copies of hazard maps in sufficient copies that they can be readily available in local offices.

Outcomes: Impacts of the Project

1. The Landslide Hazard reduction project will create a vehicle for reducing risk in landslide prone areas through increased local capability to monitor and mitigate the effects of landslides.

2. It will also be a demonstration project integrating hazards based maps into the overall comprehensive planning framework at the national and local levels.

3. The manual will be a training aid which can be disseminated to local mayors and district administrators and to the plantation corporation sectors concerned with the construction of local infrastructure and human settlements.

4. It will improve the professional understanding of landslide hazards and of the tools for warning and mitigation.

5. It will promote a village education program for the recognition of the hazards and tools to mitigate these hazards.

6. A complementary teachers curriculum on the topic for elementary level schooling will be one outcome.

7. A preparedness program will be designed to be specifically directed to home safety in landslide prone regions including the testing of contingency plans. Awareness raising of the community will be included in the manual.

8. It will result in the strengthening of the NBRO and other local organizations connected with landslide studies and will enable them to continue investigation, mapping instrumentation and implementation of mitigation strategies.

9. It will result in the establishment of capability at the provincial, district, divisional and village levels.

10. It will facilitate nationwide dissemination of information pertaining to the implications of landslide risk and the range of options for addressing the risk.

11. By establishing training materials and techniques it is anticipated that the opportunities of institutionalization for landslide hazard reduction can be enhanced throughout the region. Landslides are significant sources of life and property loss throughout the region. Landslide hazard maps have been produced in India and Nepal (in addition to Sri Lanka). These other countries have however not adopted early warning procedures and hazard mitigations practices. It is anticipated that the implementation concepts and training/educational materials produced by this project will be valuable tools which could be utilized by ICMOD/UNEP Nepal, CSIR in India, UNEP Bangkok and other institutions concerned with landslide risk reduction.

12. The opportunities for pooling of resources in public and private sectors of countries in the regions (e.g. equipment and skills) are also enhanced when such a demonstrable

network is available.

Lead National Institution

The National Building Research Organization (NBRO) has been the institution responsible for preparation of the landslide hazard maps, and this mapping project was initially funded by the UNDP. The NBRO has requested funding from the national government to expand the mapping project to two additional districts. The NBRO has credibility with respect to landslides and to other development/environmental issues, and has a track record of completing projects.

Institutional Profile: Asia Disaster Preparedness Center

Introduction

The Asia Disaster Preparedness Center (ADPC) was set up as an autonomous outreach center at the Asian Institute of Technology (AIT), in Bangkok, Thailand in January 1986. ADPC offered its first disaster management training course several months later. Since then ADPC has expanded its course offerings to cover most aspects of emergency management and has begun to broaden its disaster mitigation training offerings. It has also built up a unique information section and successfully provided technical assistance to most countries in the region helping to design training programs, mitigation programs, and preparedness strategies. ADPC is well positioned to begin transferring many of these capabilities to national institutions in the region.

ADPC now has contacts with about 800 national institutions in Asia, more than half of which work in relief and response, while the rest are development agencies (30%) or scientific and academic research institutions (20%). Hence, the number of institutions capable of providing expertise in mitigation are few.

A Vision for the Next Decade

At the end of its first decade and the beginning of its next, ADPC is now at a turning point. As a result, ADPC is in the process of evaluating its past and determining new directions in order to position itself for the next decade. Presently, ADPC is restructuring its staff, and financial and administrative structures. ADPC is developing future programs based on a philosophy of capability building through sustainable, institutional support and skills/methodologies transfer to countries in the region. ADPC plans to develop a new generation of leading edge training programs and will also continue to identify and advocate new disaster management and mitigation methodologies. At the end of its second decade, ADPC intends to be the regional center of excellence advocating for disaster management and mitigation processes a transferring these to national disaster management institutions in countries throughout Asia.

The process of restructuring programing, financial and administrative processes and procedures began with the arrival of ADPC's new Director in March 1995. The descriptions that follow represent ADPC's present and future as it is presently viewed by Senior Managers and the Director. This description should be seen as evolutionary. Therefore, some changes could take place that are not represented in this document. In July 1995, ADPC senior management will develop its first vision and strategy statement regarding ADPC's programs and activities. This new

vision and strategy statement will form the final basis for proceeding for the next several years. The following represents the starting point for that vision and strategy.

Management Structure and Reforms

Presently ADPC has five program sections which are 1) Training and Professional Development, 2) Technical Services and Academic Programs, 3) Information, 4) Asian Urban Disaster Mitigation Project (AUDMP) 5) Consultancies Management and Alumni Network. Future programs will include 6) Disaster Economics Research and Support (by September 1995), 7) Operational Training Center for Emergency Services (by January 1996), 8) National Disaster Management Center Support Services (by March 1996) and 9) UNDP Asia REgional Disaster Programs Advisor (by June 1996). (One Section, private sector participation in disaster management, was started in July 1992 and discontinued June 1995.)

ADPC also has a revitalized Finance and Administrative Support section that has a new Senior Manager and one Administrative Assistant who are establishing financial and administrative reforms. This section will be at the center of the implementation of new financial and administrative reforms, controls and procedures.

The Finance and Administrative Support section in turn is supported by AIT. AIT provides important administrative and financial services for ADPC which includes a Finance Department, Administration Department, Human Resources Department, Government Relations Office, and Travel Offices as well as office space, training and accommodation facilities. A special status with the Government of Thailand as an international organization which allows for special work permits, tax status and import of capital equipment on a duty free basis is another benefit offered by AIT.

Management changes which are underway include:

Financial and Administrative Reforms: One of the perceived problems in the past was the imposition of AIT financial and administrative procedures on ADPC. Because ADPC is not an academic program and has many different needs, this did not work. AIT now fully recognizes and supports ADPC's need to operate differently. Therefore, efforts are underway to revise AIT's policy and operating procedures so that ADPC can operate within AIT as the autonomous center that it needs to be. This should be completed within six months and will be enhanced by the following internal changes at ADPC.

Team Management Process: Each section in ADPC is headed by a Senior Manager who is a member of the overall management team which manages ADPC on a day to day basis. This management team is also responsible for envisioning and

implementing ADPC's future activities and programs. This is done through a consensus building process in which the management team considers and then decides on activities.

Cost Center Management: Each section will be operated as a cost center with its own budget and revenue sources. An internal accounting system integrated with the AIT system will be set up to track and report on the financial activities of each section.

Project Tracking and Reporting: Each section will be required to prepare at least quarterly summary reports for both internal and external use that report on their programmatic activities as well as the financial status of those activities

Resource Replacement Program: A program will be established to repair, upgrade and periodically replace all capital equipment, such as computers.

Staff Development Programs: Programs to provide training and continuing education for *all* ADPC staff will be built into the ADPC financial and administrative structure. This will be fully in place within a year.

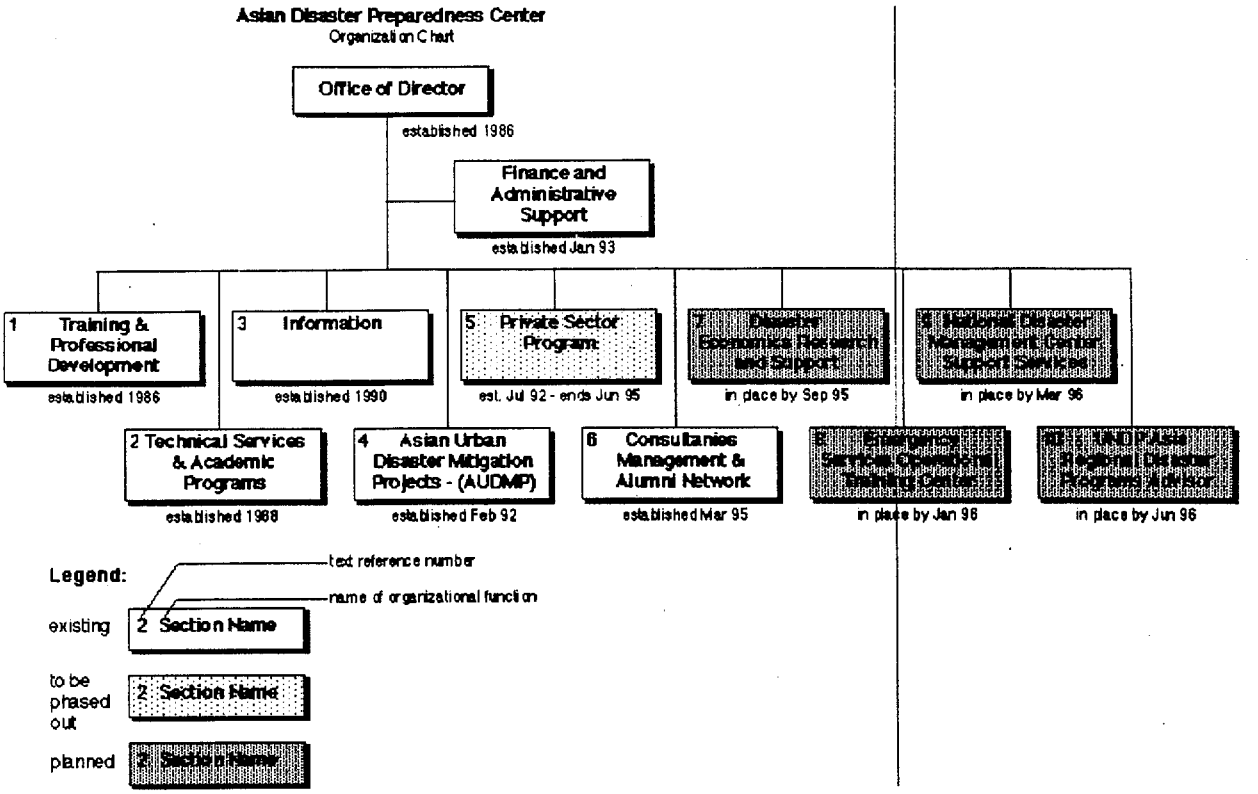
Staffing

The 1995 full time staff level of ADPC consists of 16 which include the Director, seven senior professional staff and eight support staff. Given present program opportunities and national interests in the region for ADPC support, it is projected that in 1996, the ADPC staff will grow to a total of 26 consisting of the Director, eleven senior professional staff and fifteen support staff.

Staff	*Current*	Est. 1996	Proj. Five Year
Senior Staff:	8	11	15
Support Staff:	8	15	21
Totals	16	26	36

ADPC also draws on a large network of disaster management and mitigation professionals from the region who have worked with ADPC over the years. Graduates from ADPC's own courses represent an even larger source of resource persons that assist ADPC implement technical assistance assignments and training programs.

An organization chart for 1995 and 1996 follow on the next page. It should be noted that since March 95, ADPC has been in a process of restructuring that is still ongoing. Therefore, the exact titles of sections and numbers of staff may change. However, the general overview should not.



ADPC Staff Positions by Section

		Present Staff	Future Staff	Future Funding Sources
		Prof/Sup	Prof/Sup	
1	Training and Prof'l. Develop.	1/2	3/4	fee/grants
2	Technical Services & Academic Programs	1/2	1/2	fees/grants
3	Information	1/1	2/3	grants/fees
4	AUDMP	1/0	1/3	OFDA grant
5	Private Sector Program	1/0	-/-	OFDA grant
6	Consultancies Mgmt. & Alumni Network	1/1	1/1	fees
7	Disaster Economics Research & Support	-/-	1/2	GON/IDNDR
8	Emergency Services Operational Training	-/-	2/2	ADB grant
9	National Disaster Mgmt. Center Support	-/-	1/1	grants/fees
10	UNDP Regional Disaster Advisor	-/-	1/1	CIDA/UNDP
	Office of Director	1/1	1/1	AUSAID
	Finance & Administration	1/1	1/1	OH charges
	Totals	8/8	15/21	

1995 ADPC Programs and Activities

The following describes the programs and activities of ADPC Sections:

1) Training and Professional Development: The ADPC Training and Professional Development section presently consists of a Training Manager, a Training Associate, and support staff. Based on demand, it is envisioned that this will grow over the next two years to include a Senior Training Manager, two or three Training Managers with Training Associates and needed support staff.

Since its establishment, ADPC has directly trained almost 1,500 participants from 60 countries resulting in a rich experience in designing and establishing fee based courses. In the last year, ADPC directly ran at AIT or in countries in the region, ten workshops or courses (26 weeks of training) with 30 or more participants each. These include the regional Disaster Management Courses (DMC), Improving Cyclone Warning, Response and Mitigation courses (ICWRM), UN sponsored Disaster Management Training program (DMTP) courses, Corporate Disaster Management Training (CDMT), Earthquake Prognostics, and the Cyclone/Seismic Design and Mitigation of Structures courses. Other local level courses were put on in collaboration with public and private organizations in Asian countries.

In the past, many individuals and institutions trained by ADPC have gone on to develop their own national courses further magnifying ADPC's regional impact, however, this has not been enough. Therefore, ADPC's primary training mission will be to transfer its fully developed training courses to appropriate national public and private institutions that will provide this training at national and community levels. This will be done first by a new Training of Trainers emphasis in the running of all ADPC courses. The Training of Trainers approach has been initiated by bringing national trainers in to run from beginning to end (with ADPC backup), regional and national training programs sponsored by ADPC.

Follow-up support and assistance will be offered on a fee basis if needed to help establish courses on a permanent national basis. In addition, ADPC is packaging of present courses into accredited core modules that can easily be adjusted to specific national training needs and transferred for use at national or community levels.

This effort to transfer training capacity, will be linked to t plans to assist interested Asian countries to develop autonomous National Disaster Management Centers (see Planned ADPC Programs below). Once established, ADPC will provide centers with requested support for their programs. It will also be linked to the formalization of professional development opportunities for

disaster managers.

2) Technical Services and Academic Programs: This Section now includes a Senior Technical Manager, and support staff. It is presently envisioned that it will remain approximately this size for the next several years.

Almost since its establishment, ADPC has provided technical assistance on engineering aspects of mitigation. This program is focused on improving of the skills of engineers throughout Asia to make this able to design structures that are more resistant to disasters. It has also offered technical assistance in the development of programs and strategies for reducing the vulnerability of non-engineered structures to disasters. An example of this is the award winning Cyclone Resistant Core Shelter Program in the Philippines.

The Senior Manager of this program has just been assigned the added responsibility of liaising with AIT and other universities to integrate ADPC training activities with related academic programs. It is hoped that ADPC disaster management courses will become accredited and integrated with planned regional professional development and distance learning courses for disaster professionals.

AIT and partner universities such as Swinburn University in Australia could accredit ADPC training activities so they will become integrated parts of planned disaster related academic programs. If successful, present and planned ADPC disaster management courses will become accredited and integrated with these planned regional professional development and distance learning degree courses for disaster professionals. This will also extend to affiliated national training programs that meet accreditation requirements. The existence of these programs and the opportunity to get credit for courses at ADPC, affiliated national disaster management centers and national training institutions will be an important incentive for disaster management professionals.

These programs will offer practicing professionals an opportunity to upgrade their qualifications and also receive academic credit, perhaps also for professional experience. Recognized training courses that have been offered in the region and internationally (many by ADPC) will also be evaluated and the amount of credit that can be awarded for having attended eligible courses will be determined. Disaster professionals, such as ADPC's alumni, could eventually be offered the opportunity to pursue full, distance learning degree programs. These degree programs could be offered to disaster managers and emergency managers as well as architects, engineers and planners involved in mitigation. Planned academic programs will include one year diplomas, two year graduate diplomas and three year masters degrees.

3) Information: The Information Section presently consists of one Information Manager and a Information Associate. It is envisioned that the Information Section staff will grow over the next several years to include a Senior Manager, Information Manager and support personnel that will provide support to regional and national information networks, desk top publishing services (including both video and graphics), ADPC Internet Home Page support services, disaster management research services, library information services, and library information referral services.

Since its beginnings in 1990, this Section has primarily been a repository of international, regional and national publications from throughout Asia. Its collection of disaster documents and reports on Asia is unlike any in the world. There have also been significant efforts to disseminate information such as the ADPC newsletter and the publication of two books, Disaster Mitigation in Asian and the Pacific, 1991 and Disaster Management - A Disaster Manager's Handbook, 1991. The Information Section also established and supported the ADPC Alumni Network.

Based on recommendations of recent studies funded by ADB, over the next several years the Information Section will be built up to become leading edge international and regional center for information on disasters. Research on the economics of disasters and other subjects will be done in support of regional and national requests as well as ADPC program needs. Links to other sources of disaster information such as libraries and disaster institutions will be enhanced so that requests for information available elsewhere can be answered. The development of information networks throughout the region will also be supported, with a greater emphasis on building up and supporting regional *and* national disaster networks.

4) Consultancies Management and Alumni Network: ADPC has always tried to respond to requests for technical assistance when received. However, this has more often been on an informal, ad hoc basis. As a part of ADPC's recent restructuring, the Consultancies Management Section was created to respond pro-actively to the frequent requests ADPC receives to provide technical assistance to Asian countries. It presently consists of one Senior Manager. Present and future staff will be funded by fees charged for services provided. This important new section has the capability, mandate and structure to provide on a fee basis resource people and technical experts in support of ADPC programs, regional and national requests for technical assistance and trainers.

One of the Section's primary tasks now is the identification and development of a formal network of international, regional and national disaster professionals that will allow ADPC to provide the most appropriate individuals to those requesting assistance.

The alumni network will play an important part in this network, so its management has been attached to this Section.

5) Asian Urban Disaster Mitigation Program (AUDMP): Over the last three years this program, staffed by one Senior Regional Advisor with general ADPC administrative support has provided assistance in the region for the development of urban disaster mitigation programs, disaster response assistance and assistance in developing disaster training programs. This effort has primarily been provided to USAID Missions in the region but has also been made available to UN Missions and programs. At present the primary task of this Section is the development of the Asian Urban Disaster Mitigation Project (AUDMP) which, if approved, could begin in the first FY quarter of 1996. All shelter and urban development program activity would be incorporated into the AUDMP activities.

Planned ADPC Program

6) Disaster Economics Research and Support: Based on an agreement reached with the Government of the Netherlands and IDNDR, this new Section will be established by September 1995 and will run for at least two years. It will consist of a Senior Economist, a Research Associate and a Secretary. Its purpose will be to undertake practical economic research needed to support national needs and ADPC regional programs.

ADPC has tentatively committed 20 percent of the effort of this section to support the AUDMP. This will form an important input that will enhance planned national projects, regional information components as well as the project monitoring process.

7) Emergency Services Operational Training Center: Based on a request for proposals by ADB, ADPC plans to develop a regional center that will support the development of national urban emergency services starting with a training and technical assistance center for transportation related emergencies such as automobile and train accidents. With a few unique exceptions, there is presently little if any in the way of emergency services or trained personnel that deal with such everyday accidents. Such a center can provide the much needed regional training that will support national efforts to reduce such losses and begin to institute a "culture of safety" in urban areas throughout Asia.

8) Support for Development of National Disaster Management Centers: ADPC, ADB, OFDA, Asian countries and others have long recognized the need to strengthen the two way commitment and relationship between ADPC and the countries ADPC serves. Although the specific details of this have not yet been fully developed, efforts such as the recent ADB funded study of the Institutional Development of ADPC and the related workshop offer a starting point for such an undertaking. Part of the purpose an

ADPC Vision and Strategy retreat planned for July 1995 will be to address this issue and develop a plan for pursuing this goal.

This program will begin by March 1996, but will be a long term undertaking that may take five to ten years to implement. Based on requests and interest from countries in the region, autonomous National Disaster Management Centers will be developed and supported. Where appropriate, the centers would be established based on the ADPC model, i.e., located at universities and set up as autonomous, self-supporting, practical outreach and training centers. ADPC will identify and provide direct financial support for a minimum of two years and a maximum of three years. ADPC will also provide institutional support by training trainers, providing resource people and core training modules, and offering financial and administrative backup. After two to three years, it is envisioned that centers will be stand-alone, self-funded institutions and ADPC support would be offered on a fee for services basis.

At present agreements have been reached to establish such centers on a pilot basis in Vietnam and China. Countries where future centers may be established have still to be identified, but it is anticipated that this effort will be integrated with the selection of AUDMP Lead National Institutions or National Training Institutions in the present Project target countries of India, Indonesia, Philippines, Sri Lanka and Nepal.

9) UNDP Asia Regional Representative: Based on agreements with UNDP Asia Bureau and CIDA, this new Section will be established by June 1996. It will consist of one Senior Regional Advisor and necessary support staff. Its purpose will be similar in nature to that of the present Shelter and Urban Development Programs in that it will provide disaster management and mitigation training and program development support to UN Missions in Asia.

Sources and Levels of ADPC's Funding

ADPC is an autonomous, independent cost center at AIT. ADPC receives support from AIT in its administrative, financial and contractual functions, but does not receive any direct financial support from AIT for its programs. However, AIT provides an important source of operating cash before ADPC receives fees or grant revenues from its activities. AIT plans to continue providing this operating cash "float" to ADPC. However, ADPC will be required to develop its own cash reserves over the next several years so that the amount "floated" by AIT to ADPC will gradually be reduced.

ADPC is self funded in that financial support for the center comes in the form of training participant sponsorships, fee based consultancies and grants from a broad base of development agencies including USAID, AUSAID, ADB, ODA, CEC, UNDP and JICA.

Financial support has also come directly from national governments in the form of fees for training and technical services.

ADPC start up in 1986 was funded initially by UNDP followed shortly by OFDA. Since its establishment, total revenue from USAID grants has represented approximately 30% of all ADPC funding sources. As can be seen from the previous chart, direct grants funded by OFDA over the last four years account for an average of 27% of total ADPC annual revenues.

The present OFDA/RHUDO Shelter and Urban Mitigation Programs grant provides support for one Senior Regional Advisor, travel and required administrative support. This grant has just been extended to 30 September 1995 to allow for the development of this Project Paper.

A second grant from OFDA to ADPC supports information programs in the Information section, several structural mitigation demonstration projects in Nepal, Indonesia and the South Pacific are being managed by the Technical Services section, and the Private Sector Disaster Management Programs Coordinator. The grant also funds management, administrative and other support for these programs. The Private Sector Program be completed by July 1995. The other grant funds will be fully utilized by March 1996, after ADPC requests a no-cost extension beyond the present June 1995 grant completion date.

Despite recent changes in its program and management structure as well as recent cash flow problems, ADPC is now in a relatively sound finacial position. Although ADPC owes AIT approximately $350,000 due to FY 1994/95 cash flow problems, it is expected that this deficit can be eliminated by the end of FY 1996/97. After that, yearly cash surpluses will go to a cash reserve fund or expansion of ADPC services.

Estimated revenue projections for FY 1995/96 range from about $1,300,000 (conservative) to $1,800,000 (guarded optimism). A preliminary, projected ADPC FY 1995/96 budget was developed in May 1995. It shows projected income from confirmed sources and is shown on the following page. It is shown with projected FY1995/96 revenues from AUDMP as proposed in this project paper.

Since FY 1991/92, ADPC's total revenues and related programs have grown an average of 34% per year. ADPC's total revenues for FY 1991/92 were $812,000, for FY 1992/93 were $1,412,000, and for FY 1993/94 were $1,539,000. As of March 1995, total revenues for FY 1994/95 are projected to be 1,822,000. Estimated revenue projections for FY 1995/96 range from $1,300,000 (conservative) to $1,800,000 (guarded optimism). A comparison of ADPC revenues from all other funding sources against all OFDA revenues follows. Note that the ADPC fiscal year is from 1 July to 30 June.

ADPC Revenues Analysis - July 1991 through June 1996
(includes AUDMP 1995/96 projected revenues)

note: ADPC Fiscal Year: 1 July to 30 June	5 Year Totals	FY 91/92	FY 92/93	FY 93/94	FY 94/95	FY 95/96	notes
General Program Activities 1 (Mgmt. Support/Training/Information)	250,725	123,703	123,703	3,318	-	-	ended Jul 93
General Program Activities 2 (/Mgmt. Support/Mitigation/Information)	473,000	-	-	83,570	83,570	305,860	ends Mar 96
OFDA/IDAC 1 (Private Sector)	197,000	-	98,500	98,500	-	-	ended Jun 94
OFDA/IDAC 2 (Private Sector)	133,700	-	-	-	133,700	-	ends Jun 95
OFDA/RHUDO (Shelter & Urban Mitigation Programs)	812,556	92,336	221,606	221,606	221,606	55,402	ends Sep 95
OFDA/RHUDO (AUDMP)	262,075	-	-	-	-	262,075	begins Oct 95
OFDA Funding Sub-Totals	1,866,981	216,039	443,810	406,994	438,876	623,337	
All Other Funding Sources	4,800,327	595,961	968,189	1,131,909	1,382,936	$721,332	
Total ADPC Revenues	6,667,308	812,000 (actual)	1,411,999 (actual)	1,538,903 (actual)	1,821,812 (projected Mar 95)	1,344,669 (projected) (prelim.)	
OFDA Revenues as a Percent of Total Revenues from All Other Funding Sources	27% FY91/92 thru Fy94/95	27%	31%	26%	24%		

note:
Yearly OFDA revenues shown are calculated based on the average monthly revenues over the applicable number of months the grants were in effect for the year(s) shown.

ADPC Preliminary Projected Budget for Fiscal Year 1995/96
(includes AUDMP 1995/96 projected revenues)

Program and Activities	95/96 Quarters 1	2	3	4	Revenues	Expenses	Surplus
Training/Professional Development							
(see note 2 below)							
Crisis Management Course-CMC 1	x				60,564	40,208	20,356
Technological Hazards Mgmt-THM 1	x				60,564	40,208	20,356
Disaster Management Course-DMC 20		x			116,071	83,703	32,368
Advanced Disaster Mgmt Course-ADMC 3			x		60,564	40,208	20,356
Disaster Management Course-DMC 21			x		116,071	83,703	32,368
Training Curriculum Development		x			4,654	4,654	0
Sub-Totals					418,488	292,686	125,803
Tech. Services/Academic Programs							
Seismic Haz.Mitigation (SHM-96)(JICA)			x		143,536	105,193	38,343
Struct. Mitigation Projects (OFDA)	x	x	x		220,000	220,000	0
Research Support					1,756	1,756	0
Sub-Totals					365,292	326,949	38,343
OFDA/RHUDO Urban Mitigation							
(see note 1 below)							
Shelter & Urban Mitigation Programs	x				55,402	41,436	13,964
Asian Urban Dis. Mit. Project-AUDMP		x	x	x	262,075	204,146	57,929
Sub-Totals					317,477	245,584	71,894
Information							
Support to ADPC/Reg'l Programs (OFDA)	x		x	x	91,193	91,193	0
Sub-totals					91,193	91,193	0
Consultancies Management							
Dis. Mgmt.Train&TA, Indonesia-UNDP		x			21,988	11,121	10,888
IFRC Regl. Comm. Training-IFRC	x	x			29,400	17,832	11,568
Dis. Mgmt. Unit Support, Vietnam-AusAID	x				6,076	3,626	2,450
Disaster Mgmt. Workshop, China (UNDP)	x				14,700	10,346	4,354
"Bayanihan" PMP, Philippines (USAID)		x		x	80,360	47,771	32,589
Sub-Totals					152,524	90,697	61,828
Totals					**1,344,975**	**1,047,109**	**297,866**
ADPC AdminSupport Costs	x	x	x	x			**163,407**
1995/96 Net Surplus							**134,459**

Note 1: Revenues shown include AUDMP funds as proposed in this Project Paper. However, this is *subject to review and approval by OFDA*. If the AUDMP were not to be approved, Total Revenues would be reduced from $1,1345,975 to $1,082,900 and Net Surplus would be reduced from $134,459 to $76,530.

Note 2: The majority of revenues shown come from course fees, but also include a variety of small grants for scholarships and resource people from development agencies such as ODA, AusAID, CIDA, UN-DHA and others.

Alternative Institutions for Managing Disaster Mitigation Project

The design team was asked to look at alternative institutions in Asia for managing the proposed Project. The team developed criteria or guidelines to help in this review.

Criteria for Manager of Disaster Mitigation Project

- Institutional focus on and demonstrated commitment to past and future disaster management issues.
- Institutional capacity to provide needed Project inputs for training, technical and information dissemination.
- Institutional capacity to influence both disaster management institutions and the urban infrastructure development and planning community.
- Networks and relationships with both disaster management institutions and the urban development planning and financing community.
- Institutional capacity to attract funding to expand Project beyond presently identified target countries and to sustain the initiatives of the Project after USAID funding ends.
- Recognized, influential regional institution with a clear mandate to serve all of Asia, especially Project target countries.
- Eligible for USAID grant funding (since it would take many months and perhaps a year to become eligible).
- Central location in Asia with excellent regional communication and transportation systems.

Institutions Considered

In addition to the Asian Disaster Preparedness Center (ADPC), which is described in Annex G, the team made contacts with a number of organization to determine their interest in the disaster mitigation project. Possible candidates were visited. The institutions which were investigated were the following:

- Asian Development Bank (ADB)
- UNEP/HABITAT, Asia Regional Program
- Asia and Pacific Development Center (APDC), Kuala Lumpur
- International Center for Integrated Mountain Development(ICIMOD), Kathmandu

Summary of Findings

Of the listed institutions considered, ADB was the strongest candidate as an alternative institutional home for the disaster

project. ADB is an important and influential player in Asia in the area of infrastructure development and is keenly interested in disaster management and mitigation. It is very important to note, however, that ADB felt that taking on the project would be counterproductive since ADB strongly supports ADPC in this role. ADB, which was a principal supporter of the work on the future of ADPC and the October 1994 seminar held in Bangkok, sees ADPC as the regional focal point for disaster mitigation inputs from many donors.

UNEP/HABITAT had a perspective similar to ADB's. It does not see itself as a disaster mitigation project manager, but rather a facilitator and donor.

APDC in Malaysia has a strong capacity for Project management and interest in the Project, but is not now eligible to receive USAID grant funds. Neither does it have any track record in the field of disaster management or mitigation.

Finally, ICIMOD has a mandate to focus on mountain development issues specifically in SAARC countries, which do not include Southeast Asia, the Philippines or Indonesia. ICIMOD also would have the transportation and communication difficulties inherent to managing a regional program from Nepal. While it has a strong training capacity, it does not have an in-depth background in disaster issues.

ADPC is the Recommended Institution to Manage the Project

In summary, it is impossible to recommend any of these as a viable alternative to ADPC. This institutional review demonstrated that ADPC is unique in this region. There is no other comparable institution in terms of a) a mandate for addressing disaster planning and preparedness, b) a network of contacts covering all of Asia, from former soviet republics to the Pacific, c) experience in disaster-related technical assistance and training, and d) a track record in project administration with USAID.

UNDP, UNEP/HABITAT, ADB and IDNDR see ADPC as the focal point for regional efforts in disaster preparedness. Each of them are making resources available to ADPC for discrete activities in this field. This makes ADPC ideally suited to coordinate disaster mitigation and preparedness activities from donors. ADPC is also beginning to explore with participating governments in the region how to increase host country ownership and contributions for disaster related work. Looking into the future, ADPC is likely to be an even more prominent player in years to come in regional disaster preparedness and mitigation.

Guidelines for Proposing and Selecting Demonstration Projects

Project Summary:

This Asia Disaster Mitigation Project is designed to introduce the concepts and techniques of mitigation into the built environment of cities, in order to reduce the vulnerability of people, structures, and life support systems to natural disasters. The Project will fund demonstration projects in five-six selected cities in different countries in the region. The demonstration projects will involve various planners and practitioners in these cities in an assessment and strategy excercise which will identify and address specific problems related to disaster preparedness and mitigation. While demonstration activities are needed to show specific and realistic ways to reduce the impact of natural hazards on residents and economies of targeted urban areas, the Project will also support **a training component** aimed at the replication and multiplication of the lessons learned from the city projects. This training component will run in a parallel fashion to the demonstration projects, and will be funded separately. Individuals working on demonstration projects will receive training under this component.

I. Demonstration Projects:

Demonstration projects for assessing vulnerability and developing disaster mitigation strategies will be carried out and funded two stages:

The first Stage of projects is expected to take 6-9 months. This is the stage of mapping/assessment and strategic planning. Funding for this stage will be based on proposals prepared by lead institutions (See Requirements below.)

A **second Stage** of the projects will stem from these assessments. Second stage activities are to implement selected mitigation strategies. The funding for these activities will depend upon the results of Stage I, and the merit of the proposal made for follow on activities.

Stage I: Hazard Mapping and Vulnerability Assessment

In selected, cities, hazard mapping and vulnerability assessments will be carried out to identify the potential effects of disasters and to develop mitigation strategies. Hazard maps are created by overlaying the frequency and severity of natural disasters on a geographic grid. Mapping for demonstration projects will be done on a city-wide basis using GIS technology.

The degree of vulnerability of particular areas of a city or types of structures will be determined after correlating the incidence of the hazard with underlying land uses. Once defined as "high risk", an area or types of structures can be examined more closely to determine what measures could be taken to reduce vulnerability. Usually more than one option is identified and cost-benefit analyses can be carried out on different mitigation strategies.

Stage II: Development and Implementation of Mitigation Stragies

Each of the demonstration projects is expected to identify strategies to make the city a safer place. In many cases, these will be better zoning, with the type and standard of construction related to its vulnerability. Many zones should not have any construction, and efforts may be needed to strengthen enforcement. Frequently building codes are more than adequate, but construction does not meet code. It is possible to link safety standards in buildings with the availability of insurance, thus providing incentives for safer construction.

Depending on initial vulnerability and risk assessments, more intensive assessments could be done in some target cities of the most vulnerable lifeline networks, such as power, telecommunications, transportation, or water systems. The mitigation strategies could also focus on critical facilities such as hospitals, health centers or schools (for shelters).

Proposals for specific mitigation strategies will stem from the assessments. These will vary according to the type and severity of hazards in the specific locality (e.g, earthquake or flooding), the degree of vulnerability of areas or structures that is determined, and the relative costs and benefits of alternative strategies.

II. Requirements for Participation in Demonstration Projects:

Initial proposals for demonstration projects will be for **Stage I only**. They will need to include:

a) rationale for choosing a particular city and baseline information on hazards: 1-2 pages.

This part of the proposal needs to describe the reasons for selecting a particular site for the demonstration project. The city should be one which has faced signifiant problems in the past due to natural hazards and the type of hazard should be one

which is important to other cities as well. Project proposals should include, to the extent data is available, baseline data on natural hazards (frequency of occurrence, damage, injury and deaths)

b) list of participating institutions and the individuals from those institutions who will participate (in training and the project): 1 page

This part of the proposal should indicate which institutions, offices and individuals will form the demonstration project team. The role of each institution/office should be given. The names of the individuals should be provided to ensure that discussions have taken place about the project and the level of effort that will be required.

c) description of the lead institution which will be responsible for coordination and management of local activities: 3-5 pages

This is one of the most important sections of the proposal. A single institution will need to take the lead in coordinating inputs and activities, and keeping the assessments and strategy excercise on track. The description of this Lead Institution will be an extremely important part of the selection and approval of the project. In each country this institutions will be selected on the basis of stability, quality of past performance, local reputation and management capability.

The Lead Institution will need to describe its institutional capability with regard to the following:

- *Project Management Experience:* Number of years of experience managing projects or studies (preferably by the institution but may be by the team assembled to do this by the institution).
- *Ability to continue project activities in the medium term:* Demonstrated ability to continue providing technical support to similar disaster mitigation projects after demonstration project funding ends.
- *Financial and Administrative Capability:* Annual auditing of institutions finances by independent auditors.
- *Network:* Contacts with the cross section of decision makers, professionals and institutions needed to carry out the project (scientific, development and disaster management community).
- *Computers and Information Hardware:* Access to number and type of computers needed for GIS mapping, vulnerability studies, risk assessments, information exchange (Internet), etc.

d) identification of local contributions:

Funding requirements for participation include local contributions of at least 15% of project costs, both in-kind and cash. This may come in part from other levels of government, or other donors, but the total contribution should be about 15%. The sources of funding will need to be identified in the proposal. If deemed necessary, Memorandum of Understanding or Letters of Committment from participating institutions may be requested, indicating the roles and contributions of each, particular with regard to staff time.

III. Training Program:

People working on demonstration projects will receive training which will be developed for a national training program. The curriculum will be practical, but with rigorous academic underpinnings. Instructional materials will be developed,including training manuals, audio-visual materials, GIS computer program instruction, and hand-outs for students. These materials will be translated and adapted, as necessary for each of the countries. The training will be designed to equip project implementors and participants with the necessary knowledge and skills to assess problems and develop solutions. It is expected that additional materials will come out of the demonstration projects which will be useful for on-going training programs. For example, case studies on hazard mapping and vulnerability assessment, examples of simple, low-cost methods for assessing and improving housing and infrastructure, technical papers on solutions for specific hazards, etc.

A lead training institution will be selected from each country, which may be a university or a professional training institute. Trainers from this institution will receive training in the core curriculum. They will in turn give these courses nationally. Participants in the demonstration projects will be expected to participate in the following courses:

*Risk Management and Mitigation for Urban Professionals: This course, designed for a broad range of urban professionals and decision-makers, will provide participants with an overview of all disaster mitigation considerations in the urban development process such as hazard, vulnerability and risk assessments, risk management, risk audits, policy issues, land use planning considerations, the role of insurance, as well as general disaster management and preparedness planning. This course will be designed to be conducted in its entirety or in modules, tailored to a wide target audience. It will also be promoted as a course that can be adapted and integrated into the programs of

disaster management training and development assistance agencies.

*Hazard, Vulnerability and Risk Assessment: This more technical course for planners and engineers will teach participants the skills required to do detailed hazard and vulnerability assessments and risk management for urban areas or urban investment projects. From the assessment, the participants will learn to identify appropriate, cost-effective mitigation strategies.

*Structural Hazard Mitigation for Earthquakes

OR

*Structural Hazard Mitigation for Floods and Landslides:

Additional courses may be designed between the national training institution and the institution managing the demonstration project.

IV. Criteria for Institutions Participating in the Disaster Mitigation Training Activities

- *Institutional Training Experience:* Number of years of experience conducting training and other short courses (preferably by the institution but may be by the team assembled by the institution).
- *Long Term Commitment:* Demonstrated ability to continue courses on a fee basis after project ends.
- *Training Personnel:* At least three faculty identified that have the proper background, qualifications, commitment and time to participate in the regional training of trainers courses, develop national training courses and develop a plan for institutionalizing these courses.
- *Computers and Information Hardware:* Access to number and type of computers which can be used for GIS mapping, vulnerability studies, risk assessments, information exchange (Internet), etc.

AUDMP - Detailed Budget Estimate

National Demonstration Projects, Regional Training and Information

(3 year totals)	Totals	Counterpart Funds	USAID/OFDA Funds	
National Demonstration Projects	**$2,240,000**	**$261,000**	**$1,979,000**	
Municipal Pilot Projects	$1,610,000	$210,000	$1,400,000	
Special Technical Inputs	$239,000	$0	$239,000	
In-Country Training	$391,000	$51,000	$340,000	
Regional Information & Network Support	**$473,000**	**$280,000**	**$193,000**	
Regional Network Survey, Development & Support	$75,000	$0	$75,000	
Information Exchange, Publications and Films	$398,000	$280,000	$118,000	
Regional Training Support	**$654,000**	**$25,000**	**$629,000**	
Training of Trainers (Core Curriculum)	$484,000	$25,000	$459,000	
Policy Seminars & Networking	$170,000	$0	$170,000	
Sub-Totals	**$3,367,000**	**$566,000**	**$2,801,000**	72%

Project Implementation

(includes all salaries, expenses, direct costs and 33.7% overhead per USAID audit)	Totals	Counterpart Funds	USAID/OFDA Funds	
Project Management Team (PMT) Costs (incl. OH)	$960,000	$0	$960,000	
Computers and Equipment	$50,000	$0	$50,000	
Sub-Totals	**$1,010,000**	**$0**	**$1,010,000**	26%

Project Evaluation

(by Outside Consultants Through RHUDO)				
Project Evaluations	$80,000	$0	$80,000	
Sub-Totals	**$80,000**	**$0**	**$80,000**	2%
3 Year LOP Totals	**$4,457,000**	**$566,000**	**$3,891,000**	
Yearly Totals 1	$1,320,000	$180,000	**$1,140,000**	
Yearly Totals 2	$1,631,000	$200,000	**$1,431,000**	
Yearly Totals 3	$1,506,000	$186,000	**$1,320,000**	

Estimated Budgets by Component (OFDA Funded Portion)

National Demonstration Projects	$1,979,000	
Training and Policy Workshops	$629,000	
Information	$193,000	
Sub-Total	$2,801,000	72%
Project Implementation (ADPC)	$1,010,000	26%
Monitoring and Evaluation (RHUDO)	$80,000	2%
Total	$3,891,000	100%

Estimated Budget by Inputs (OFDA Funded Portion)

Grants to Lead National Institutions for Pilot Projects	$1,120,000	29%
Short Term Consultancies	$712,000	18%
Training, Policy Workshops, Other Support and Direct Costs	$969,000	25%
Project Implementation (ADPC)	$1,010,000	26%
Monitoring and Evaluation (RHUDO)	$80,000	2%
Total	$3,891,000	100%

Estimated Budget by Project Activity (USAID Grant Funded Portion)

National Demonstration Projects	$2,394,000	62%
Training & Policy Workshops	$1,053,000	27%
Information	$444,000	11%
Total	$3,891,000	100%