Project Report No. 1

Project Completion Report of the Kathmandu Valley Earthquake Risk Management Project

September 2000

Under the

Asian Urban Disaster Mitigation Program

adpc
Asian Disaster Preparedness Center
Bangkok, Thailand www.adpc.net

The **Kathmandu Valley Earthquake Risk Management Project** was launched in September 1997 under the Asian Urban Disaster Mitigation Program. The objective of the Nepal national demonstration project is to reduce earthquake vulnerability of Kathmandu valley by establishing appropriate earthquake risk management policies. Developing an Earthquake Scenario and Action Plan was one of the initial steps undertaken by the project. Other components of the project are improving school earthquake safety, increased public awareness, and building capacity of local institutions and professionals. The project, implemented by the National Society for Earthquake Technology-Nepal in association with GeoHazards International, USA, has successfully institutionalized an annual Earthquake Safety Day as a mean to raising public awareness, in addition to organizing masons' training and demonstrating successful retrofitting of selected schools in the valley.

This paper is published under the Asian Urban Disaster Mitigation Program for sharing knowledge and experiences from national demonstration projects on disaster mitigation in target countries of Asia. It is made available by the Asian Disaster Preparedness Center, Bangkok, Thailand, with minimal editing. The opinions expressed herein are those of the author and do not necessarily reflect the views of Asian Disaster Preparedness Center or the U.S. Agency for International Development. Publication of this paper was made possible through support provided by the Office of Foreign Disaster Assistance, United States Agency for International Development, under the terms of Cooperative Agreement No. 386-A-00-00-00068.

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Acknowledgements

It is with great pleasure that ADPC presents this Kathmandu Valley Earthquake Risk Management Project (KVERMP) completion report. The Asian Urban Disaster Mitigation Program (AUDMP) is one of the largest regional programs managed by the ADPC and KVERMP is the national demonstration project in Nepal. The AUDMP, which is currently being implemented in Bangladesh, Cambodia, Laos, India, Indonesia, Nepal, Philippines, Sri Lanka, has demonstrated successful methodologies and approaches in mitigating the impact of the natural disasters in the region. During implementation of the national demonstration projects by country partners, there has been continuous building of knowledge and experience emanating from the country projects. The national demonstration projects have produced wealth of knowledge in the form of hazard maps, reports, proceedings, review of policies, documentation of various events and activities, etc.

The purpose of making this report available to a larger audience, is to share the knowledge and experiences with those promoting earthquake risk mitigation in their respective constituencies at community, city and national levels and to impart learning from the experiences of the national demonstration project activities carried out by KVERMP.

The KVERMP is implemented by the National Society for Earthquake Technology (NSET)-Nepal in association with GeoHazards International, USA. This report, produced by the NSET-Nepal at the end of phase II of the demonstration project, highlights the process, methodology and strategy and approach in implementation of activities of KVERMP.

ADPC congratulates the NSET-Nepal and .its partner GeoHazards International, USA and other collaborating institutions, for successfully implementing the demonstration project activities and appreciate their efforts in further promoting earthquake risk management policies. The initiatives taken by the NSET for establishment of appropriate mechanisms through Govt. and private sector partnerships for reducing the loss of lives and damage of properties from devastating earthquake disasters are of great value to those interested and engaged in similar activities elsewhere in the region.

We hope that you will find this report useful and we look forward to receiving your comments.

Dr. Suvit Yodmani
Executive Director
Asian Disaster Preparedness Center
Bangkok, Thailand

September 2000

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1 INTRODUCTION

This is the project completion report of the Kathmandu Valley Earthquake Risk Management Project (KVERMP). KVERMP started in September 1997 and continued through the end of February 2000.

Although the replication phase of KVERMP still continues, and that NSET-Nepal and GHI are continuing the efforts of KVERMP, the report wraps up the KVERMP project status for the period September 1997 to February 2000.

2 SITUATION PRIOR TO THE PROJECT

The situation in the field of earthquake risk management in the Kathmandu Valley, and in Nepal as a whole could briefly be described as given below:

- Seismic hazard assessment done earlier under the Building Code Development Project (1992-1994) did produce a shocking revelation that Nepal faces very high level of earthquake hazard, and that the risk, especially in the urban areas is increasing. The earthquake risk of Kathmandu Valley was identified as very high. The level of awareness towards earthquake hazard and risk was very low among the population as well as among the decision-makers and municipal authorities. Despite this threat, there was no institution within Kathmandu Valley to assess earthquake hazards or promote an earthquake risk management program to develop organized approach towards reducing the earthquake risk. People asked two important questions, notably, 1) what will happen to Kathmandu Valley if an earthquake similar to the one in 1934 strikes again? and 2) what should be done to reduce the earthquake disaster? However, these questioned remained unanswered.
- NSET-Nepal was created in 1993, and it tried to work in this direction. But, in those days, NSET was simply a group of enthusiastic professionals. It did not have any office or physical infrastructure, nor any permanent staff. Institutionally, it was very weak. So despite the potential of it contributing to earthquake risk reduction, it was unable to deliver significantly due to lack of resources and support.
- The technical information about the earthquake risk in Kathmandu Valley was incomplete and scattered among several governmental agencies. It was not synthesized, was not applied to the infrastructure of modern day Kathmandu Valley, and was not presented in a form that the public and government officials could digest.
- The National Seismological Center of the Department of Mines and Geology conducted monitoring of Himalayan seismicity, and was implementing a project for expansion of the network to 17 stations.
- Draft of the national building code was prepared. But it was lying just on shelf, unimplemented.
- It was obvious that there were four fundamental elements necessary to reduce the earthquake threat in Kathmandu Valley:
    1. Estimation, using all information currently available, of the probable consequences of a repeat of the 1934 earthquake on modern day Kathmandu Valley. This estimation should be expressed in nonprofessionals' terms so as to be readily understood by the public,

business leaders and government officials. This will provide a factual basis for a sound public policy concerning earthquake safety.

2. A comprehensive set of earthquake risk management recommendations based on the expected consequences of a large earthquake which is developed by local and international specialists in government, city planning, urban infrastructure, and emergency services; and addresses the most significant aspects of the Valley's risk.
3. A properly constituted and equipped organization in which government, business and academic leaders collaborate to foster earthquake risk management and incorporate earthquake disaster mitigation strategies into Kathmandu Valley urban development process. This organization would be vital also to facilitate, monitor, and assist in the implementation of risk management programs.
4. A demonstration project in which the earthquakes risk of some critical, vulnerable element of society is reduced. Such a project should not only accomplish a tangible improvement (to leave something more than reports and organizations), but also contribute to the training of local people.

3 OBJECTIVES OF THE KATHMANDU VALLEY EARTHQUAKE RISK MANAGEMENT PROJECT (KVERMP)

The Kathmandu Valley Earthquake Risk Management Project was designed to meet four objectives:

1. Evaluate earthquake risk and prescribe an action plan for managing that risk;
2. Reduce the public schools' earthquake vulnerability;
3. Raise awareness of the public, of Nepalese government officials, of the international community resident in Kathmandu Valley, and of influential organizations abroad concerning Kathmandu Valley's earthquake risk; and
4. Build local institutions that can sustain the work launched in this project.

4 PROJECT PARTNER AGENCIES – DESCRIPTION, ROLES AND RESPONSIBILITIES

No.	Project Partner Institutions	Responsibilities
	Government Institutions	
1	Ministry of Science and Technology	• Contact Ministry • Seat of Earthquake Safety Day National Committee (NSET is a member of the Committee) • Project Advisor
2	Ministry of Home	• Focal Point on Disaster Management in Nepal • Seat of IDNDR National Committee (NSET was a Member) • Project Advisor
3	Department of Urban	• Project Advisor

No.	Project Partner Institutions	Responsibilities
	Development and Building Construction (The Department of Housing & Urban Development and Department of Buildings merged in 2000 to create this department)	• Owner of Nepal Building Code
4	Department of Mines & Geology	• Project Advisor • Generator/source of data / information on geology, seismology
5	Department of Bureau of Standard and Metrology	• Project Advisor • Generator of Nepal Standards
6	Department of Health Services, Epidemiology Disease Control Division	• Project Advisor • Contact agency for health-related disaster management issues
7	Department of Water Induced Disaster Prevention	• Project Advisor • NPTI • Training / Research Center on Flood, Landslide, Erosion
8	Central Regional Education Directorate	• Project Advisor for School Earthquake Safety Program • Key Contact Institution for Kathmandu Valley Schools
9	District Education Offices of Kathmandu, Lalitpur & Bhaktapur Districts	• Project Advisors for School Earthquake Safety Program
10	Royal Nepal Army	• Participant to Scenario, Action Plan and other activities of KVERMP
32	Department of Archeology	• Participant to Scenario, Action Plan and other activities of KVERMP
33	Department of Roads	• Participant to Scenario, Action Plan and other activities of KVERMP
34	Tribhuvan International Airport	• Participant to Scenario, Action Plan and other activities of KVERMP
35	Juddha Fire Brigade	• Participant to Scenario, Action Plan and other activities of KVERMP
36	Nepal Electricity Authority	• Participant to Scenario, Action Plan and other activities of KVERMP
37	Nepal Water Supply Corporation	• Participant to Scenario, Action Plan and other activities of KVERMP
38	Nepal Timber Corporation	• Participant to Scenario, Action Plan and other activities of KVERMP
39	Rastriya Beema Sansthan	• Participant to Scenario, Action Plan and other activities of KVERMP
41	Bir Hospital	• Participant to Scenario, Action Plan and other activities of KVERMP
42	Patan Hospital	• Participant to Scenario, Action Plan and other activities of KVERMP
43	Bhaktapur Hospital	• Participant to Scenario, Action Plan and

No.	Project Partner Institutions	Responsibilities
		other activities of KVERMP
44	Infectious Disease Hospital	• Participant to Scenario, Action Plan and other activities of KVERMP
45	TU Teaching Hospital	• Participant to Scenario, Action Plan and other activities of KVERMP
46	Birendra Army Hospital	• Participant to Scenario, Action Plan and other activities of KVERMP
47	Birendra Police Hospital	• Participant to Scenario, Action Plan and other activities of KVERMP
48	Maternity Hospital	• Participant to Scenario, Action Plan and other activities of KVERMP
49	Kanti Children Hospital	• Participant to Scenario, Action Plan and other activities of KVERMP
62	School & Community Health Project/ JICA	• Participant of ESD, provided financial support for Art Competition during ESD
54	Department of Soil Conservation and Watershed Management & JICA Disaster Management Program	• Participant (rented stall and exhibited DM efforts/materials) of Earthquake Safety Exhibition on the occasion of Earthquake Safety Day) and to Scenario, Action Plan and other activities of KVERMP
		•
11	Nepal Police	• Participant to Scenario, Action Plan and other activities of KVERMP
	Autonomous Government Body	
12	Nepal Administrative Staff Collage (NASC)	• NPTI • Participant to Scenario, Action Plan and other activities of KVERMP
		Academic
13	Institute of Engineering	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor
	Non-Government	
14	Nepal Red Cross Society	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Participant of ESD, conducted training of First Aid
	Disaster Preparedness Network (DPNet) A loose network of agencies involved in disaster preparedness in Nepal	• Co-implementer of DM activities
28	United Mission Nepal	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Co-implementer of Ward level DM programs • Provided in-kind contribution
31	Lutheran World Federation	• Participant to Scenario, Action Plan and other activities of KVERMP

No.	Project Partner Institutions	Responsibilities
		• Project Advisor • Co-implementer of Ward level DM programs • Provided in-kind/cash support for NSET's awareness raising materials •
	Professional Societies	
15	Nepal Engineers' Association	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Co-organizer of Seminars, Symposia
16	Nepal Geological Society	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Co-organizer of Seminars, Symposia
17	Society of Nepalese Architects	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Co-organizer of Seminars, Symposia
18	Society of Consulting Architectural & Engineering Firms (SCAEF)	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Co-organizer of Seminars, Symposia • Funding agency for the Shake table & building model
	Business Organizations	
40	Sagarmatha Insurance Company	• Participant to Scenario, Action Plan and other activities of KVERMP
50	Kathmandu Model Hospital	• Participant to Scenario, Action Plan and other activities of KVERMP
51	Medicare National Hospital & Research Center	• Participant to Scenario, Action Plan and other activities of KVERMP
19	Federation of Chamber of Commerce and Industries	• Supporter of KVERMP initiatives • Funding agency
	Municipalities	
20	Kathmandu Metropolis	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Co-organizer of Seminars, Symposia • Supporter of Ward level training and other activities
21	Bhaktapur Municipality	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Co-organizer of Seminars, Symposia • Supporter of Ward level training and other activities
22	Lalitpur Municipality	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor

No.	Project Partner Institutions	Responsibilities
23	Madhyapur Municipality	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Co-implementer of Environmental Mapping Program
24	Kirtipur	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Co-implementer of Environmental Mapping Program
	International Organizations	
25	United States Agency for International Development (USAID Kathmandu)	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor
26	United Nation Development Program	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Provides support to government on coordinating international relief • Seat of 3 Working Groups (Food, logistics, Health) for disaster management
27	RUDO/ South Asia	• Provided funds for the two environmental mapping programs
29	United Nations Educational for Scientific & Cultural Organization (UNESCO)	• Co-implementer of the project for developing Manual on Earthquake Resistant Design of School Buildings • Provided in-kind/cash support for NSET's awareness raising materials
30	World Health Organization	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Seeks NSET support for implementing health-related disaster management training programs • Client of the Development of Health-focused Emergency Country Profile of Nepal
55	Building and Construction Improvement Program, Agha Khan Foundation, Pakistan	• Participant (rented stall and exhibited DM efforts/materials) of Earthquake Safety Exhibition on the occasion of Earthquake Safety Day • Participant of ESD Symposium
56	Indonesian Urban Disaster Mitigation Program, Indonesia	• Participant of ESD Symposium
57	Lutheran World Federation-Nepal	• Participant to Scenario, Action Plan and other activities of KVERMP • Project Advisor • Provided financial and in-kind contribution for NSET's publications
58	United Mission to Nepal/	• Participant to Scenario, Action Plan and

No.	Project Partner Institutions	Responsibilities
	Disaster Response Program	other activities of KVERMP • Project Advisor • Provided financial and in-kind contribution • Sought NSET's technical support for its Low-cost Earthquake Resistant Demonstration Project in Butwal area
59	Health Care Foundation/ National Kidney Center	• Participant of ESD Symposium
60	Kathmandu 2020	• Awareness Raising
61	Nepal Scouts	• Participant (rented stall and exhibited DM efforts/materials) of Earthquake Safety Exhibition on the occasion of Earthquake Safety Day
63	Panchakanya Steel Industries Ltd.	• Participant (rented stall and exhibited DM efforts/materials) of Earthquake Safety Exhibition on the occasion of Earthquake Safety Day
64	Harisiddhi Brick Factory Ltd.	• Participant (rented stall and exhibited DM efforts/materials) of Earthquake Safety Exhibition on the occasion of Earthquake Safety Day
65	Hama Iron & Steel Industries	• Participant (rented stall and exhibited DM efforts/materials) of Earthquake Safety Exhibition on the occasion of Earthquake Safety Day
66	**GeoHazards International (GHI)**	**Co-implementer of KVERMP**

5 PROCESS – FOR LAUNCHING OF THE PROJECT

The following steps were taken for launching the Project.

1. First initiation

- Amod Dixit, Brian Tucker and David Hollister met in Bangkok Workshop (1993) of the World Seismic Safety Initiative (WSSI) and identified the necessity of implementing a project for the development of earthquake scenario for Kathmandu Valley in the same line as was done by GeoHazards International in Quito. The WSSI Bangkok Workshop provided motivation for the establishment of NSET.
- Dave Hollister and Brian Tucker visited Kathmandu to assess the needs. A preliminary proposal was prepared and submitted to ADPC by GHI based on discussion with Amod Dixit, who was in the process of establishing NSET-Nepal.

2. Project Conceptualization

- Following the initiation of AUDMP, Dave Hollister visited Kathmandu during January 1997 for initial exploration of implementing the project under AUDMP. Dave Hollister held extensive discussion with related institutions regarding the project.

- A one-day **Project Definition Workshop** was organized on 12 March 1997. Sixty representatives of various related government and non-governmental organization and donor agencies participated. The workshop provided broad inputs and guidelines for the project design and implementation.

3. Project Design

A Project Design Team was created with Brian Tucker (GHI), Amod Dixit, Madhav Mathema (UNCHS), and Dr. Richard Sharpe (Beca Worley) as members. This team followed the recommendations of the workshop, AUDMP objectives, and prepared the project outline based on the actual need of Kathmandu, the available resources and opportunities of broader participation by other agencies. NSET and GHI prepared the detailed project proposal and cost estimates.

4. Kick Off Workshop

A Kick off workshop was organized in October 1997, one month after the formal start of the project in September. The objective of the kick off meeting was to convey to the related institutions the project scope of works so that they could see their roles in the project. The workshop provided the transparency to the project, which was instrumental for its later success and wide ownership.

5. Project Management

The day-to-day activity of the project was conducted by a staff headed by the Project Director. An Advisory Committee provided the oversight and advised the project on approaches. A separate School Earthquake Safety Advisory Committee was created in view of the ever-increasing activities of the School Earthquake Safety Program of KVERMP. The advisory committees assisted in achieving transparency by increasing the outreach.

6 PROJECT ELEMENTS – ACTIVITIES UNDER EACH COMPONENT

The main project elements are listed below. Subsequent changes in the project elements, departures from original concepts and new additions are described.

6.1 DEVELOPMENT OF AN EARTHQUAKE SCENARIO AND EARTHQUAKE RISK MANAGEMENT ACTION PLAN FOR KATHMANDU VALLEY

Activities undertaken are given in the following Table.

No.	Sub-activities	Comments
6.1.1	Assess Earthquake Risk of Kathmandu Valley	• Included literature review, review of historic earthquakes, compilation of data, selection of scenario earthquake, superimposition of the intensities of 1934 Earthquake on modern day infrastructure of Kathmandu Valley, preparation of risk maps

No.	Sub-activities	Comments
6.1.2	Interview Operators of Critical Facilities	• Included development and revision of interview schedule, interview managers of 31 emergency response and critical facilities, explaining to them the risks, assessment of the possible impact to the facility and response system by the scenario earthquake, and the present capacity to respond and possible risk management measures.
6.1.3	Scenario workshop	• Participants included representatives from the 32 institutions, plus other government officials, business leaders, community representatives, few international experts including RADIUS experts • The workshop generated two products: a. An earthquake scenario for Kathmandu Valley that is supported by the workshop participants b. A list of suggested activities to reduce Kathmandu Valley's earthquake risk
6.1.3	Write & publish scenario document	• Scenario document prepared and published in Nepali and English describing the likely consequence of a large earthquake on Kathmandu Valley.
6.1.4	Develop Action Plan	• Map out institutions with responsibilities of disaster management (about 80 institutions) • Organize mini-workshops with select institutions for developing objectives, implementation strategies, and for selecting initiatives • Develop a consensus Action Plan in a workshop with all related institutions
6.1.5	Publish and distribute Action Plan Document	• Action Plan (and Scenario) released by the Prime Minister on the occasion of the First Earthquake Safety Day, January 1999. Both documents sent to all participating institutions, all donor agencies/diplomatic missions operating in Nepal.

6.2 SCHOOL EARTHQUAKE SAFETY (SES)

Activities undertaken are given in the following Table.

No.	Sub-activities	Comments
6.2.1	Establish School Earthquake Safety Advisory Subcommittee	• SES Advisory Committee established with Director, Central Region Education Directorate as chairman. • Regular meeting of the SES Advisory Committee held
6.2.2	Survey of Earthquake Vulnerability of Kathmandu Valley Public Schools	• Developed improvised method for survey involving school headmasters • Designed survey form (questionnaire), subjected to international review • Conducted Pilot Seminar with school headmasters to test survey form; modify survey form

No.	Sub-activities	Comments
		test survey form; modify survey form • Conducted a series of 15 seminars with school headmasters to educate them on earthquake risk to school and to teach them on survey conduction • Headmasters conducted survey. Forms collected, data entered into Database, analyzed. • Field verification of survey data, conducted additional survey for missing/inappropriate data • Vulnerability assessment of school building classes, development of conceptual retrofit design, review by national/international experts, cost estimation • Conduct detailed survey of ten school buildings, prepare detailed retrofit design for one school, and design verification by international expert.
6.2.3	Raise funds for school retrofit	• Fund raising done nationally and internationally
6.2.4	Implement Retrofit of one school building	• Additional activity. Retrofit of the main building of Bhuwaneshwory Lower Secondary school completed
6.2.5	Implement seismic-resistant reconstruction of another school building	• Additional activity. An additional building of the school demolished and reconstructed with seismic – resistant elements in place
6.2.6	Report to School Authorities	• Extended activities under the SES program and close interaction with the education authorities, and specially, development of a sense of ownership by the Education offices as well as by the schools did not require any specific report to be prepared, as the general report on SES program would suffice.
6.2.7	Prepare and Submit Proposals for School Retrofit	• The Report on SES replaced this activity.
6.2.8	Prepare Report on SES	• A Comprehensive Report on SES was prepared.
6.2.9	Design Earthquake Preparedness Curriculum Element	• Changes in the SES program required development of curriculum for masons' training, Manual for Teachers for Training the Children (Earthquake Kit), and School Earthquake Emergency Response Plan.

6.3 PUBLIC AWARENESS

Activities undertaken are given in the following Table.

No.	Sub-activities	Comments
6.3.1	Establish Earthquake Safety Day	• At NSET's request, Government of Nepal declared January 16 as the Earthquake Safety Day of Nepal, and established an Earthquake Safety Day National Committee for observing the Day annually throughout Nepal.
6.3.2	Public talks about Kathmandu Valley's Earthquake Risk	• The extent of this activity increased several times over during project implementation. Conducted numerous talk programs, meetings, discussions, interviews on FM/AM Radio Programs (including with BBC), Television (National as well as international such as Young Asia Television), Newspapers, and Journals etc. • Held 2 Symposia and several seminars with international participation
6.2.3	Write & publish Report for public	• NSET generated, in association with partnering institutions, several types of awareness raising materials including handbooks and posters, videos etc. All these materials have been widely distributed resulting in a significant increase in awareness level in Kathmandu Valley and the country.

6.4 INSTITUTION BUILDING

Activities undertaken are given in the following Table.

No.	Sub-activities	Comments
6.4.1	Municipalities – Disaster Management Office	• The newly established disaster management office of Kathmandu Municipality was assisted by providing two-week long services of an experienced emergency response official from the US. • The expert provided training to the staff of the Disaster Management Unit of KMC. Officials from other municipalities also participated in the training.
6.4.2	Grant writing Awards for reducing earthquake risk of privately-owned buildings	• This activity was considered not necessary at the moment, and the resource was used for other more important activities/additional activities.
6.4.3	Institutional strengthening of NSET	• **Attendances in International Conferences**: Several NSET staff participated in international conferences/workshops abroad. Expenses for such participation was largely from outside the KVERMP budget. **Visit to similar institutions in other countries**: NSET key project professionals visited several

		institutions in Japan, US, New Zealand, India, Philippines, Thailand.

6.5 TRAINING

Activities undertaken are given in the following Table.

No.	Sub-activities	Comments
6.5.1	National training on Disaster Management	• NSET assisted NPTIs to develop curriculum for UDM training. The training program will be conducted shortly.
6.5.2	Participation in AUDMP/ADPC Regional training programs	• Three NSET staff participated in Regional training program of AUDMP. • NSET facilitated participation of Nepalese professionals from partnering institutions in 1) Technological Disaster Management, 2) Urban Flood Management, 3) PEER TFI • NSET staff participated in the international training program conducted under RADIUS.
	Conduction of Training Programs on Disaster Management	• NSET organized several training programs, especially community-based, in the wards of Kathmandu & Lalitpur municipalities. • NSET organized several training programs for media people on Disaster management and how to report disaster events (disaster journalism).

7 RESULTS ACHIEVED

7.1 OBJECTIVE TREE

Program Goal: Reduced natural disaster vulnerability of urban populations, infrastructure, lifeline facilities and shelter in Asia.

Project Objective: Establishment of sustainable mechanisms for earthquake disaster risk reduction in Kathmandu Valley.

Objective Indicators:

1. Number of institutions that have incorporated earthquake risk reduction as a permanent or significant part of their operations as a result of this project.
2. Number of earthquake disaster risk reduction plans committed to occur as a result of the project.
3. Amount of funding committed to earthquake risk reduction projects following the start of this project by non-AUDMP sources.

Result 1: Increased awareness about earthquake risk and how to reduce earthquake risk.

Indicators:

1.1 Number of informational articles, television presentations, lectures, etc. about earthquake risk and/or how to reduce earthquake risk conducted by the project or as a result of the project

1.2 Number of awareness materials published and distributed by NSET/KVERMP as a result of the project.

1.3 Number of training programs about general earthquake risk and/or how to reduce earthquake risk conducted by the project or as a result of the project.

1.4 Number of substantive meetings with high-level decision makers about earthquake risk and/or how to reduce earthquake risk conducted by the project.

1.5 Amount of people (approx.) given educational materials distributed by the project.

Result 2: Improved mechanisms for public and private institutions to implement risk-reducing activities.

Indicators:

2.1 Number of risk reducing action plans created, assessment methods established, maps, guidelines prepared as a result of the project.

2.2 Number of professionals that have an improved technical or other expertise relating to risk reduction as a result of the project who are currently active in risk reduction activities.

2.3 Number of institutions where KVERMP-initiated skills training and professional development courses are institutionalized

Result 3: Increased number of earthquake risk mitigation activities initiated.

Indicators:

3.1 Number of risk reducing projects occurring or committed to occur as a result of the project.

7.2 PROJECT PERFORMANCE MATRIX

AUDMP FORM

PROJECT PERFORMANCE MATRIX
KATHMANDU VALLEY EARTHQUAKE RISK MANAGEMENT PROJECT
PERIOD COVERED: September 1, 1997 to February 29, 2000

Performance Indicators	Base-line	Life of Project Target	Project Achievement	Comment on Progress
Project Objective: Establishment of sustainable mechanisms for earthquake disaster risk reduction in Kathmandu Valley				
Objective Indicator No. 1: Number of institutions that have incorporated earthquake risk reduction as a permanent or significant part of their operations as a result of this project.	None	10 institutions	11 institutions 1. Disaster Management Committee in Kathmandu Municipality Ward No. 34 2. Disaster Management Committee in Lalitpur Municipality Ward No. 10 3. Disaster Management Unit of Kathmandu Metropolitan City 4. Ministry of Science & Technology, Earthquake Safety Day National Committee 5. Disaster Preparedness Network Nepal (DPNet) 6. Radio Sagarmatha (FM Radio, Kathmandu) 7. CARE Nepal 8. Ministry of Health 9. NSET-Nepal 10. DPNET Bhuwaneshwory Lower	1. Lalitpur Municipality, Bhaktapur Municipality & Madhya Municipality have expressed interest in establishing Disaster Management Units. 2. Incorporation of earthquake risk reduction programs is long-term process: certain changes in the mind-set of several institutions on the need of earthquake risk reduction have been achieved in several institutions, although initiation of specific programs have not yet be initiated in those institutions.

Performance Indicators	Base-line	Life of Project Target	Project Achievement	Comment on Progress
			Primary School, Nangkhel	
Objective Indicator No. 2: Number of earthquake disaster risk reduction plans committed to occur as a result of the project.	None	1 plan	1 Plan	1. Kathmandu Valley's Earthquake Risk Management Ac Plan has been prepared. 2. Nepal Telecommunications Corporation (NTC) have expressed interest in working with NSET for the development and implementation of an Emergency Response System for NTC 3. NSET will be working with New Zealand volunteers an Hospital for developing emergency response system fo Bir Hospital starting from Oct. 2000 4. A guideline for emergency response planning for scho will be prepared in 2000. Pilot plans will be prepared fo 4 public schools
Objective Indicator No. 3: Amount of funding committed to earthquake risk reduction projects following the start of this project by non-AUDMP sources.	$0	$500,000	$281,348.67 (This figure includes only the in-kind contribution to KVERMP from non-AUDMP sources)	• KVERMP has plans to present high priority earthquake risk projects to the major donor agencies of Kathmand Valley. In addition, KVERMP has been working with lo institutions to discuss projects that can be funded by lo sources. • Funds for a 5-day training program for earthquake preparedness for health officials provided by OFDA/UN • Funds for a 2-day training program for earthquake mitigation of hospitals provided by WHO/SEARO • GHI has committed to provide US$45,000 to NSET for undertaking school retrofits in 2000 • UNCRD committed to provide US$15,000 for developing/implementing a system of mason/teachers training for earthquake safety. • OFDA intends to provide an institutional support grant $450,000 for a period of 3 years to NSET • Participation of KVERMP/NSET personnel to different

Performance Indicators	Base-line	Life of Project Target	Project Achievement	Comment on Progress
				international conferences (for presenting KVERMP lessons) supported by different organizations.
Result No. 1: Increased awareness about earthquake risk and how to reduce earthquake risk.				
Indicator No. 1.1: Number of informational articles, television presentations, lectures, etc. about earthquake risk and/or how to reduce earthquake risk conducted by the project or as a result of the project.	A few	50 articles, television appearances, lectures, etc.	61 Newspaper/Journal articles • 50 local newspaper articles on earthquake risk management • 25 interviews of KVERMP staff on local TV or radio • 35 presentations at local workshops or seminars • Presentation at 15 international forums (conference, workshops, symposia, seminars)	• The number of newspaper articles and the number of occasions of airing of interviews/special programs on R and TV are actually much higher than the figures prese because many go unnoticed. • The impact due to the efforts is great as manifest in the increase in the general knowledge about earthquake ris KV among the population • Responding to popular demand, NSET is initiating week 3-hr long lecture/talk program for homeowners and engineers/architects who are building new houses or wa to retrofit the old ones. The emphasis will be on earthquake-resistant construction.
Indicator No. 1.2: Number of awareness materials published and distributed by NSET/KVERMP as a result of the project.	1	5 items: posters, pamphlets, fliers etc.	7 items	• One poster published on the occasion of the IDNDR Da 1998, Two posters on Earthquake Safety Days 1999& 2 • Two fliers with information of Dos & Don'ts on earthqua and EQ resistant building construction • One poster on Modified Mercalli Intensity Scale • EQ. Preparedness Handbook • NSET Website in operation
Indicator No. 1.3: Number of training programs about general earthquake risk and/or	0	5 training programs	9 training programs	• 2 training conducted of media students in disaster repor • 2 training conducted of wards in natural disasters, especially earthquakes (Ward 10 Lalitpur and Ward 34

Performance Indicators	Base-line	Life of Project Target	Project Achievement	Comment on Progress
general earthquake risk and/or how to reduce earthquake risk conducted by the project or as a result of the project.				Kathmandu) • 1 training conducted by KVERMP consultant Shirley Mattingly for KMC DMU • National training program on UDM yet to be conducted collaboration with DPTC and • National training program on earthquake risk mitigation to be conducted
Indicator No. 1.4: Number of substantive meetings with high-level decision-makers about earthquake risk and/or how to reduce earthquake risk conducted by the project.	0	60 meetings	51 meetings	• Keen interest shown by all high level decision-makers, especially by the Chief Secretary and Secretaries to the ministries of HMG/Nepal
Indicator No. 1.5: Number of people (approx.) given educational materials distributed by the project.	0	5,000 people	7000 people	• Posters distributed nationally (Ministry of Home assisted distribute these via the district headquarters) • NSET publications (EQ. Scenario, Action Plan, Posters) and other Materials sent to all ministries.
Result No. 2: Improved mechanisms for public and private institutions to implement risk-reducing activities.				
Indicator No. 2.1: Number of risk reducing action plans created as a result of the project.	0	1	1	• The Kathmandu Valley's Earthquake Risk Management Action Plan.
Indicator No. 2.2: Number of professionals that have an improved technical or other expertise relating to risk	0	100 professionals	724 professionals	The number in the left column includes: • Engineers/architects • Journalists • Administrators

Performance Indicators	Base-line	Life of Project Target	Project Achievement	Comment on Progress
expertise relating to risk reduction as a result of the project who are currently active in risk reduction activities.				• Managers of NGOs/INGOs
Indicator No. 2.3: Number of institutions where KVERMP-initiated skills/training and professional development courses are institutionalized.	0	2	2	• NASC and DPTC developed as NPTIs • Disaster management as an elective course of study be initiated in Masters level program of Pokhara University • Training program on Building Code will be established i the Pulchowk Campus of the Institute of Engineering • Training programs on CBDM will continue in other ward Kathmandu Municipality
Indicator No. 2.4: Number of policies established or revised to facilitate action, regulation, enforcement and or incentives.	0	1	1	• Earthquake Safety Day Established • Earthquake Safety Day National Committee created to organize programs on ESD annually
Result No. 3: Increased number of earthquake risk mitigation activities initiated.				
Indicator No. 3.1: Number of risk reducing projects occurring or committed to occur as a result of the project.	None	3 projects	4	• Projects for school retrofitting, mason training, and development of school emergency response planning w be implemented in 3 schools in 2000 by NSET • Replication, in part, of KVERMP experiences will be ma in Dharan and Pokhara • Ward No. 34 of KMC, with assistance from NSET (usin WSSI-Fellowship funds) will implement neighborhood le disaster management capability enhancement program • JICA planning to implement a 1.5 yr earthquake risk reduction project in Kathmandu Valley with Home Minis (total cost estimated as 2 million US$).

7.3 PROJECT IMPACT

Some of the visible impacts of KVERMP are described below.

Raised Awareness:	KVERMP has significantly helped to raise awareness on earthquake risk and mitigation possibilities in Kathmandu Valley. Earthquake Safety Day is becoming a widely observed national event
NSET authority established **(Institutional Strengthening)**	Now NSET is a better known as a reliable and dedicated institution. Several; organizations are either working with NSET on program basis (Education Directorate, Kathmandu on SES; UNESCO on SES; Sagarmatha FM on awareness raising through weekly program; GHI as supporter of SES program, especially in raising funds for retrofits; UNCRD on SES in training and school emergency response planning), or plan to work (Nepal Telecommunication Corporation; Bir Hospital; World Health Organization Kathmandu; municipalities and Urban Development Committees of Kathmandu & Pokhara valleys, and the municipality of Dharan etc.)
Scenario Accepted	US Embassy (Kathmandu), and UNDP (Kathmandu) have accepted KV Earthquake Scenario as standard for formulating their preparedness plans
Increased participation in SES	Overwhelming response received from local communities for SES. Schools on NSET's priority receive funds for SES from District Development Committees
International Impact	NSET's methodology of Scenario and Action Plan development accepted and employed by RADIUS WSSI accepted KVERMP as a successful case to be replicated. WSSI awarded the first WSSI Fellowship to KVERMP Project Director in recognition of his work and potentials for future.

However, it must be realized that seismic risk reduction is a long-term process for any country, more so over, for a developing country like Nepal. Therefore, the above-mentioned impacts should be considered on a relative basis. We started from a "nothing" situation. KVERMP helped us to reach "something" status in terms of earthquake risk reduction in the country and in Kathmandu Valley in particular.

8 LESSONS LEARNED

Generally, the stated objectives of the projects have been achieved very successfully, but many lessons, both positive and negative, were learned in the process. These lessons are described below. The experience gained from examining these lessons will benefit all types of mitigation projects in Nepal.

8.1 PROJECT MANAGEMENT AND APPROACH

- **Flexibility of funding agency is critical to success**

The project funding agency (the Asian Disaster Preparedness Center, with funds from USAID) allowed considerable flexibility in distribution of funds and schedule. This was critically important because, despite the best efforts, the original project concept, schedule and budget proved to be inadequate in many ways once work was underway. The implementation of KVERMP was an evolutionary process, and the flexibility of ADPC allowed the project to pursue the best results, regardless of whether or not they fit the project contract exactly.

As an example, the level of effort required for developing the earthquake scenario increased greatly from what was originally anticipated. The number of institutions interviewed increased from 15, the originally planned number, to 29, and required 3 to 4 visits for each institution lasting 1 to 3 hours per visit. The project proposal assumed these visits would require 1 hour apiece. The increased effort placed on these interviews allowed us to get better information from the organizations and secured their interest, involvement and ownership of project results.

The scenario interviews are only one of many activities that required greater resources than anticipated and, therefore, necessitated shifts in schedule and budget. Several project activities that were originally planned were never completed as a consequence. By allowing us to learn from our experiences as we worked, we believe that our final project achievements are much more significant than they would have been if we had strictly followed the project contract.

- **Awareness raising became part of all project components**

Raising awareness was originally stated as a project objective, but as we worked it became clear that raising awareness was, in fact, a crucial component of everything we were doing. Every activity we undertook was shaped to raise the awareness of different groups - government officials, media, international agencies, etc.

Specifically, our emphasis in developing the earthquake scenario was not in producing precise, technically sophisticated results, but in involving all key institutions in developing and understanding simple technical results. The action plan development was not focused on identifying the activities that made the most sense to experts, but to educate policy makers that actions can and must take place. The action plan was developed by querying policy makers about activities that were most feasible to undertake given Nepal's current political climate. Similarly, the school earthquake safety program emphasized educating headmasters about their risk and their ability to reduce it. Low-tech methods were used to classify the structural safety of each school so that the headmasters could participate in and learn from the process. One result of this outreach is that project workshops were actually working sessions, not platforms for various individuals to display their wisdom, which happens frequently in Nepal.

As an additional note, we were surprised to find that release of the results of loss estimates did not create any panic in the population. It rather made a larger part of the society wanting to improve the situation. This leads us to believe that the traditional belief of possible generation of panic should not be used as an excuse for not releasing information on risk.

- **Low-tech approach was optimal**

The project consistently adopted simple technical approaches, which made the project cost-effective and understandable to the laypersons. It also helped to focus the project on implementation of risk reducing actions, our major aim. In Nepal, people are tired of seeing millions of dollars spent on studies without any implementation of actions.

Unlike many projects, KVERMP put greater emphasis on the use of past research rather than conducting new technical or scientific studies. The decisions to use a repeat of the 1934 earthquake shaking and simple, existing methods to produce loss estimates were very important. These loss estimates were cost-effective and produced a significant impact on the community without causing undue panic. This approach built upon the works of GeoHazards International and Escuela Politecnica National (GHI, 1994) in Quito, Ecuador. Similarly, the low-tech approach adopted for screening the seismic safety of schools produced useful results affordably, and in a timely way. Both of these efforts should someday be followed by more detailed technical studies, but our low-tech work has given quick and strong motivation and direction to the mitigation efforts, which are desperately needed to save lives in Nepal.

- **Emphasis on community level work is important**

Implementation of the action plan and earthquake risk reduction as such cannot be achieved unless consideration for earthquake safety starts becoming a part of the society's culture. Common people started taking interest in earthquake issues and raising questions shortly after the project began. This prompted the project to work on an experimental basis with two of the wards of Kathmandu municipality. The residents of these wards have, on their own initiative, taken several actions to try to assess and decrease the risk of their neighborhoods. The enthusiasm and potential of these groups has been exciting and such community work should be a part of future efforts of NSET.

- **Focus on School Earthquake Safety drew criticism**

KVERMP was criticized for focusing only on public schools. Many people questioned why hospitals, a critical facility for post-earthquake response, were not chosen. Additionally, people asked why cinemas, private schools and colleges were not examined. The project team continued explanation for its focus on school did not quell the criticism. However, given the limited resources available, KVERMP continued the focus on schools, noting that the work on schools was building NSET's capacity to evaluate the vulnerability of other systems in the future. The school survey examined many previously unknown attempted activities: the costs of conducting a survey of building vulnerability, the technical expertise required for this type of survey, the costs involved in strengthening existing vulnerable buildings, the types of techniques to use for strengthening typical Nepalese structures, the interest of the community in strengthening buildings, the ability to attract funds (local and international) to this type of work, and the levels of earthquake risk acceptable in Nepalese society.

- **NGO status both helped and hindered project implementation**

NSET faced problems from both local and international institutions due to its NGO status. Locally, NGOs have a tarnished reputation as corrupt and ineffective. Internationally, many agencies are not able to work with NGOs, requiring direct relationships with governments. This limited funding opportunities.

Ultimately, NSET's NGO status was extremely beneficial to the project. The flexibility of the non-government group allowed fast and cost-effective work. Its staff and programs remained stable throughout the project duration. Last, NSET's non-political status allowed it to work effectively among all groups, despite the highly politicized atmosphere in Nepal.

- **Efforts at transparency difficult but valuable**

The project made many efforts to be transparent, most significantly, the creation of an advisory committee to oversee all project work. This committee helped to draw in many influential people in the process of project implementation. The dialogue of this committee and other groups helped to build an environment of trust. The approach adopted by the project to keep people abreast about ongoing activities and interim findings, supported by maps, and documents helped establish the authority of NSET.

Frequent changes of people in the government positions during the project implementation period at time hindered the institutional interaction between the project and the different organizations. However, due to the massive outreach efforts of this project, project results will be openly available for all those who wish to use them, unlike many previous studies, which have become inaccessible after a project is completed.

- **Institutional development is a long-term process**

The project helped NSET to strengthen and establish itself as a leader in earthquake disaster management activities in Nepal. However, NSET still requires a great deal of institutional help before it can be a self-sustaining and fully effective organization. In particular, NSET needs to improve its management capabilities, reduce its dependence on a few key-people and improve authority delegation. It needs to broaden its ability to attract funds, and increase its ability to plan long-term strategy and day-to-day activities. This project has increased the interest and concern of Kathmandu Valley citizens about earthquake so significantly that NSET is overwhelmed by requests for help. In order to effectively meet all of these demands, NSET needs to address the aforementioned issues.

As a side note, a lack of regional experience in scenario and action plan development caused many to doubt NSET's capability to implement KVERMP. For example, "Why should we have in Nepal an earthquake scenario prepared, when even India does not have it for its cities?" was a comment made by some institutions. General thinking that Nepal is not a leader in technical areas could inhibit NSET's future work.

- **A new model for national-international project partner relationship developed**

The co-operation between OFDA (core funding agency), ADPC (AUDMP coordinator), CUI (technical assistance and oversight provider) and NSET was

extremely successful and significantly different than previous projects conducted in Nepal. This new model was extremely cost-efficient, helped to build local institutions, and produced successful results.

First, primary control of the project and a majority of project funds went to NSET. This contrasts strongly with many previous development projects in which nearly all funds are spent on foreign consultants, and local specialists play a secondary role. Second, significant international support and guidance were given to NSET through GHI, ADPC and OFDA. The involvement of these groups helped to strengthen NSET's abilities and added confidence to NSET's staff. These groups worked as true partners with NSET, accepting that local specialists knew the best methods to address local problems.

The success of this project caused it to be a model for the United Nations RADIUS project implemented in nine cities around the world.

8.2 EARTHQUAKE SCENARIO AND ACTION PLAN

- **The Scenario and action planning process were successful because:**
  - It was prepared was prepared with active involvement of all concerned (stakeholders)
    - Through the process of interaction, interviews, workshops
    - Loss estimates were used to initiate and sustain the dialogue/discussion
    - Simple maps, with lamination, were very effective to sustain the dialogue
    - Respective institutions involved to assess their own institutional capabilities for recovery
- **Scenario: An Effective Awareness Promotion Tool**
  - The scenario was effective to promote awareness:
    - To buy-in authorities, to develop the Action Plan
    - Provided the required motivation to seek/identify actions
    - Scenario was effective because the stake holders were involved in its preparation
    - Scenario provided the motivation: risk reduction ideas started coming in from officials, when the institutions were formally requested to identify actions that could help reduce the risk
- The priority actions that have been included in the Action Plan constitute a huge task that require motivational and awareness raising efforts apart from implementing the actions themselves. Moreover, there are other actions included in the plan and they also require much effort for implementation. Since NSET - Nepal is the only one institution that has taken up the responsibility to coordinate the earthquake risk management action in the country, this institution continues getting requests from different agencies for assistance in different fields including training and awareness-raising. This situation is at times overwhelming for NSET-Nepal, which is a rather small organization with limited manpower. Moreover, the question of sustaining NSET on a long term is always there because NSET has not reached a position to sustain itself financially. Solution to this problem lies partly in the development of a long-term vision of the institution, based upon a careful mapping of the opportunities and potentials.

8.3 SCHOOL EARTHQUAKE SAFETY PROGRAM

- There is a tremendous opportunity for replicating the successes of our School Earthquake Safety Program. We are now working very closely with the Ministry of Education and its different offices to implement the program. The response received from the school communities as well as from donors has been overwhelming. NSET – Nepal should continue the School Earthquake Safety Program (SESP) at least for a few more years.
  - SESP, however, needs to be modified from its original concepts. Apart from retrofitting and reconstructing school buildings to withstand the identified seismic forces, this program should also incorporate training of the school community (teachers, parents, and the children) on earthquake safety and preparedness. Accordingly, SESP now incorporates i) Training of teachers, ii) training of children, and development of School emergency response plans for the schools, and development of appropriate manuals, guidelines, and training curricula. SESP also incorporates iv) training of masons. We believe that such modification will help in setting up a process towards increased earthquake safety in the whole school system of Nepal in the long run.

8.4 AWARENESS RAISING

- Establishment of the Earthquake Safety Day helped much in awareness raising. There is a tremendous opportunity for replicating the successes of our School Earthquake Safety Program. We are now working very closely with the Ministry of Education and its subordinate agencies. The response received from various institutions of the replication cities of Pokhara and Dharan has been very positive. It is necessary now to initiate a planning process to identify optimal programs for the cities for earthquake risk management. Given financial constraints, NSET has developed a strategy to link the earthquake risk management activities with its other programs such as the Environmental Mapping program for the municipalities (NSET has been implementing such mapping programs for municipalities with financial support from RUDO South Asia).

9 SUSTAINABILITY

The question of sustainability should be looked upon from two angles: 1) sustainability of NSET, and 2) sustainability of the project impacts.

Sustainability of NSET as an Organization

The project helped NSET's transformation from a "weak" institution (an institution, with registration with the government, with a management committee consisting of volunteers. It did not have any office or physical infrastructure or communication facilities) into an institution with all modern office facilities, with well defined action plan, and tremendous trust on the part of Nepalese Society. It is now an authority in matters related with earthquake risk management in Nepal. There is a tremendous increase in its perceived responsibility, especially for continuing the works started in the KVERMP process. However, despite the success of KVERMP and an institutional growth of NSET, it is still vulnerable in terms of financial sustainability.

Therefore, it is necessary that NSET be provided financial/institutional support, at least for a few more years to continue the process. The sustainability of the

Fortunately, there are good signs: KVERMP has helped much in increasing the national and international outreach of NSET, which has provided tremendous intellectual support to NSET. Many institutions, projects and even individuals are interested in helping NSET. It is expected that an institutional grant will be received from OFDA/USAID. The necessary process is ongoing.

Sustainability of KVERMP Impacts

The concept of Sustainability should not be limited to self-financing projects or to financial sustainability as such. Creation of appropriately conducive environment should be considered as an element for potential sustainability of the KVERMP impacts. Recognizing that the project was launched in a complicated institutional and financial environment, and that there was not a single initiative on earthquake safety run by any agency, the situation now is much better.

The Earthquake Scenario and the Action Planning process has done much not only in raising awareness on earthquake risk, but also in developing several initiatives by other related institutions. Currently, several institutions have either updated their operational emergency plans (e.g. Nepal Police, Royal Nepal Army etc.) or prepared (or started to prepare) emergency response plans (e.g. UNDP).

Several other projects are in the pipe line: the JICA sponsored project for Earthquake Risk Mitigation for Kathmandu Valley, to be implemented for 16 months with the Ministry of Home as the Implementing Agency. Nepal is being considered as a case study city for detailed study by UNDP/ISDR, Kathmandu is one of the cities for consideration by the Global Earthquake Safety Index (GESI) project, etc.

The School Earthquake Safety program of KVERMP is showing a good sign for continuation as more and more partnering agencies are getting involved apart from the growing interest of local businesses. UNESCO and UNCRD are already involved in the process.

With the OFDA support for the next three years, it is almost sure that NSET will be in a position to influence the earthquake risk management process in Nepal in the coming years. The center point is NSET Action Plan that provides the required motivation and starting base for so many different institutions.

10 REPLICABILITY

Replicability of the KVERMP initiatives is already a proven fact. Preliminary works have already been done for replicating scenario/action plan development for the cities of Pokhara and Dharan municipalities. This process will continue even after the AUDMP contract for the Replication Phase, and will include the training, school safety and awareness raising components.

The replication process is already ongoing in Kathmandu Valley. Last year's experience of retrofitting one building and seismic reconstruction of another building of Nangkhel School is currently being replicated in four different schools of the valley. Plans have already been chalked out for replicating similar works in more schools in 2001.

New modes of awareness raising works are being explored and implemented. Cooperative arrangement between NSET and Sagarmatha FM Radio has allowed initiation of a weekly program on earthquake awareness. New awareness raising materials are planned for printing for the Earthquake Safety Day 2001.

Thus there is a much better environment for the replication of the KVERMP initiatives in different cities in Nepal in the next few years.

11 FINANCIAL PROFILE

KATHMANDU VALLEY EARTHQUAKE RISK MANAGEMENT PROJECT (KVERMP)

FINANCIAL PROFILE

Period covered: September 1997 to February 2000

Budget Line Items	Obligated Amount from AUDMP ($)	Advances from AUDMP ($)	Expenses from AUDMP Budget ($)	Deviations from line items (A-C), $	Transferred to Replication Phase, $	Deviation in Disbursement % (D / A)	In-Kind or Cash Contribution from Non-AUDMP Sources, $	Total Proje Cost, (C+H),
	A	B	C	D	E	G	H	I
1. Project Management	102,543.00	102,811.75	104,587.15	-2,044.15	19.26	-2	6,455.00	111,042.15
2. Advisory Meeting & Kick Off Meeting	2,100.00	2,100.00	1,612.05	487.95	-	23	39,250.66	40,862.71
3. Scenario and Action Plan	46,150.00	44,613.31	44,613.35	1,536.65	-	3	12,704.99	57,318.34
4. School Earthquake Safety	33,200.00	35,682.75	34,610.90	-1,410.90	-	-4	61,873.83	96,484.73
5. Public Awareness	16,100.00	16,080.39	16,401.94	-301.94	-	-2	46,763.42	63,165.36
6. Training	24,650.00	19,485.74	19,474.11	5,175.89	4,000.00	21	108,124.14	127,598.25
7. Monitoring and Evaluation	6,400.00	6,180.21	6,139.44	260.56	-	4	5,915.41	12,054.85
8. Recipient Contracted Audit	900.00	891.89	584.80	315.20	-	35	1,661.20	2,246.00
TOTAL	**232,043.00**	**227,846.04**	**228,023.74**	**4,019.26**	**4,019.26**		**282,748.65**	**510,772.39**

12 EXTERNAL FUNDS SUPPORT – FROM OTHER DONORS

KATHMANDU VALLEY EARTHQUAKE RISK MANAGEMENT PROJECT (KVERMP)
COUNTERPART CONTRIBUTION
Period covered: September 1997 to February 2000

Line Items	Planned contribution in US$	Contribution from Different Sources (e. g. Institutions, Businesses & Individuals) through NSET		In-kind Contribution by GHI	TOTAL
		Cash	In-kind		
Pre-project GHI/NSET Expenditures	$6,450.00	$0.00	$1,455.00	$5,000.00	**$6,455.00**
Project Management	$30,314.00	$0.00	$3,837.83	$35,412.83	**$39,250.66**
Advisory Meeting & Kick Off Meeting	$20,548.00	$0.00	$11,534.16	$1,170.83	**$12,704.99**
Scenario and Action Plan	$58,514.00	$0.00	$17,070.81	$44,803.02	**$61,873.83**
School Earthquake Safety	$31,513.00	$5,261.00	$30,466.39	$11,036.03	**$46,763.42**
Public Awareness	$6,460.00	$11,006.90	$90,435.74	$6,681.50	**$108,124.14**
Training	$8,992.00	$0.00	$3,679.75	$2,235.66	**$5,915.41**
Monitoring and Evaluation	$833.00	$0.00	$565.39	$1,095.81	**$1,661.20**
TOTAL BUDGET	**$163,624.00**	**$16,267.90**	**$159,045.07**	**$107,435.68**	**$282,748.65**

Attachment 1: List of Project Outputs

A. REPORTS

1. Report on School Earthquake Safety
2. Report on Vulnerability Assessment of Bir Hospital and Teku Hospital
3. Report on Chamoli Earthquake
4. Report on Structural Safety, Evaluation and Strengthen Measures for buildings of UMN Headquarter Complex

B. MAPS

5. Kathmandu Valley Intensity Distribution Map of 1934
6. Kathmandu Valley Liquefaction Potential Map
7. Kathmandu Valley Potential Electricity System Damage Map
8. Kathmandu Valley Potential Water System Damage Map
9. Kathmandu Valley Potential Telephone System Damage Map
10. Kathmandu Valley Potential Road Damage Map
11. Kathmandu Valley Hospitals and Liquefaction Potential Map

C. DOCUMENTS

12. Earthquake Scenario of Kathmandu Valley in Nepali Language
13. Kathmandu Valley Earthquake Risk Management Action Plan
14. Earthquake Scenario of Kathmandu Valley in English Language
15. Earthquake Preparedness

D. POSTERS

16. IDNDR DAY Poster
17. Earthquake Safety Day 1999
18. Modified Mercalli Intensity Scale (Abridged)
19. Earthquake Safety Day 2000

E. VIDEO

20. KVERMP Kickoff Inauguration
21. Kathmandu Valley Scenario Workshop
22. Kathmandu Valley Action Plan Workshop
23. School Earthquake Safety Headmaster Seminar
24. NSET Strategic Planning Workshop
25. Earthquake Safety Day 1999
26. School Retrofit
27. Earthquake Safety Day 2000

F. NEWSLETTER

28. NSET Newsletter Vol 1. No 1
29. NSET Newsletter Vol 2. No 2

G. LEAFLET

30. Earthquake Safety Tips
31. Earthquake Resistance Construction Tips for Masonry Construction

Attachment 2: Inventory of Equipment

S.No.	Code	Definition	Quantity	Unit	Remarks
01.	***WF***	***Wooden Furniture***			
01.	**ETS**	Executive Table with Side Units	3	Set	
02.	**OTD**	Office Table Desk	2	Set	
03.	**MRT**	Meeting Room Table	1	Set	(One set includes 6 Unit)
04.	**MRC**	Meeting Room Chair	20	Pcs.	
05.	**OCA**	Office Chair with Arm	6	Pcs.	
06.	**PCT**	Photo Copy Table	1	Pc.	
07.	**SPB**	Soft Pin Board	6	Pcs.	
08.	**OSR**	Open Small Rack	2	Pcs.	
09.	**WWB**	Wooden White Board	2	Pcs.	
10.	**WCT**	Wooden Computer Table	1	Pc.	
11.	**TTD**	Table Top Drawer	3	Pcs.	
02.	***SF***	***Steel Furniture***			
01.	**OCB**	Office Cup-Board	2	Pcs.	
02.	**OFC**	Office File Cabinet	2	Pcs.	
03.	**OBC**	Office Book Case	1	Pc.	
04.	**MDC**	Map and Drawing Cabinet	1	Pc.	
05.	**MWB**	Metalic White Board	3	Pcs.	Two of them are Magnetic
06.	**ERC**	Executive Revolving Chair	1	Pc.	
07.	**GCB**	Glass Door Cup-Board	5	Pc.	
08.	**SAR**	Slotted Angle Rack	3	Pcs.	
03.	***OE***	***Office Equipment***			
01.	**CSM**	Computer set with Monitor	4	Set	
	CPU	*CPU*	*4*	*Pcs*	
	MON	*Monitor*	*5*	*Pcs*	One monitor is not in working condition
02.	**LTC**	Lap Top Computer	2	Pcs.	
03.	**PRN**	Printer	4	Pcs.	
04.	**UPS**	Uninterruptible Power Source	3	Pcs.	
05.	**PCM**	Photo Copy Machine	1	Pc.	
06.	**FXM**	Facsimiles Machine	1	Pc.	
07.	**OHP**	Over Head Projecter	1	Pc.	
08.	**PSR**	Projecter Sceen	1	Pc.	
09.	**SPP**	Slide Projection Projecter	1	Pc.	
10.	**LJS**	Leser Jet Scaner	1	Pc.	
12.	**ZDhbbD**	Zip Drive	2	Pc.	
04.	***EE***	***Electrical Equipment***			
01.	**EGS**	Electric Generator Set	1	Set	
02.	**EFH**	Electric Fan Heater	2	Set	
03.	**ELS**	Emergency Light (Small)	1	Pc.	
04.	**ELT**	Electric Thermus	1	Pc.	
05.	**VCC**	Vaccum Cleaner	1	Pc.	
05	***CE***	***Communication Equipment***			
01.	**EBX**	EPABX Set (2-In, 6-Out)	1	Set	One Key Telephone Set included
02.	**TEL**	Telephone Set	6	Pcs.	
06.	***SG***	***Stationary Goods***			
01.	**HPM**	Heavy Duty Punching Machine	2	Pcs.	2 hole and 3 hole one each

S.No.	Code	Definition	Quantity	Unit	Remarks
02.	**SBM**	Spiral Binding Machine	1	Pc.	
03.	**HDS**	Heavy Duty Stapler	1	Pc.	
10	***OG***	***Miscllenous Goods***			
01.	**MWD**	Mineral Water Dispenser	1		
02.	**KBH**	Kerosine Burner Heater	2		

Attachment 3: Consultants Used

No.	Project Component	Name of Consultant	Remarks
1	Scenario/Action Plan	Shirley Mattingly	Cost contributed by GHI
2		Tom Tobin	Cost contributed by GHI
3		Parimal Jha (Workshop Facilitator)	Cost contributed by GHI
4	Institution Building (Support to the Disaster Management Unit of Kathmandu Metropolitan Corporation, including training)	Shirley Mattingly	Cost contributed by GHI
5	Business Plan Development	Tom Tobin	Cost (in part) contributed by ADPC/AUDMP from non-KVERMP budget
6		Karuna Management (Sahadev Mahat, Ravi Pradhan, Anil Chitrakar)	
7	Environmental Mapping Workshop	ODC (Deep Narsingh Karkee)	
8	School Earthquake Safety	Prof. A. S. Arya	
9		Jyoti Prasad Pradhan	
10		Surendra Lal Pandey	
11		Saroj Kumar Baidya	
12		Jitendra Bothara	

Attachment 5: Project Profile

Project Title:	**Kathmandu Valley Earthquake Risk Management Project**
Project Location:	Kathmandu Valley, Nepal
Hazard Type:	Earthquakes
Project Management:	The National Society for Earthquake Technology - Nepal (NSET-Nepal) and GeoHazards International (GHI)
Project Co-Directors:	Mr. Amod Dixit, NSET-Nepal Mr. Brian Tucker, GHI
Project Co-Managers:	Mr. Mahesh Nakarmi, NSET-Nepal Ms. Laura Dwelley-Samant
Project Design:	Mr. Brian Tucker (GeoHazards International); Mr. Amod Dixit (SILT Consultants/NSET); Mr. Madhab Methema (UNCHS); Dr. Richard Sharpe (Beca Worley)
Schedule:	Start date: September, 1997 End date: February 2000
Total Project Cost:	US $580,294
Total USAID Cost:	US $304,000
Total Counterpart:	US $276,294

Project Summary:

Nepal has a long history of destructive earthquakes. With a burgeoning population of almost a million people, uncontrolled development, and building construction techniques that have changed little in the past century, Kathmandu Valley becomes increasingly vulnerable to catastrophic earthquakes with each passing year. The objective of the project is to reduce the earthquake vulnerability of Kathmandu Valley. The project will have four main components: 1) Scenario and Action Plan; 2) School Earthquake Safety; 3) Public Awareness; and 4) Institution Building and Training. The Scenario and Action Plan component will involve disseminating information on earthquake risks and consequences in a form that is understandable to public officials and citizens, information gathering from operators of critical facilities, presentation of a likely earthquake scenario to public and private decision makers, and generation of an action plan. The School Earthquake Safety component established an advisory sub-committee on school safety, designed earthquake preparedness curriculum, conducted a participatory evaluation of the vulnerability of the schools within Kathmandu Valley, and produced proposals for funding the retrofit of the most at-risk school buildings. The Public Awareness element combined public outreach in the form of various information pieces and public talks. Highlight of KVERMP was the establishment and celebration of an annual Kathmandu Valley Earthquake Awareness Day on the Anniversary of the devastating earthquake of 1934. Finally, the Institution Building and Training component helped to build the capacity of NSET and assisted the Disaster Management Unit of the Kathmandu Metropolitan City.

Participating Institutions:	
Government	❖ *Ministry of Science and Technology:* Key Project Contacts: Mr. Poshan N. Nepal, Secretary Mr. Mohan B. Karki, Joint Secretary Mr Punya P. Neupane, Joint Secretary
	❖ *Ministry of Home:* Key Project Contacts: Ms. Usha Nepal, Joint Secretary Dr. Meen B. Poudyal Chhetri, Under Secretary
	❖ *Department of Housing and Urban Development:* Key Project Contacts: Mr. Sashi Bahadur Thapa, Director General
	❖ *Department of Mines & Geology* : Key Project Contacts: Mr. Nanda Ram Sthapit, Director General
	❖ *Bureau of Standard and Metrology:* Key Project Contacts: Mr. Purna P. Manandhar, Director General
	❖ *Department of Health Services:* Key Project Contacts: Dr. Mahendra Bahadur Bista, Director, Epidemiology Disease Control Division
	❖ *Disaster Prevention Technical Center:* Key Project Contacts: Mr. Kedar Prakash Rizal, Executive Director
	Central Regional Education Directorate: ❖ Key Project Contacts: Mr. Kamal Prasad Lal Karna, Regional Director
	❖ *Royal Nepal Army:* Key Project Contacts: Brig. Gen. S. B. Shah
	Nepal Police: ❖ Key Project Contacts: Mr. K. M. Shrestha, Additional IGP Mr. Shyam Singh Thapa, SSP
Academic	***Nepal Administrative Staff Collage (NASC)*** ❖ Key Project Contacts: Mr. Shambhu Saran Prasad Kayastha,Executive Director Dr. S. P. Shrestha, Director
	❖ *Institute of Engineering* Key Project Contacts: Prof. Dr. Jib Raj Pokhrel, Dean Prof. Dr. Mukunda P. S. Pradhan Assistant Dean & Campus Chief, Pulchowk Campus
Non-Government	❖ ***Nepal Red Cross Society*** Key Project Contacts: Mr. Ramesh Sharma, Chairman Mr. Dev Ratna Dhakhwa, Secretary General
	Society of Consulting Architectural & Engineering Firms (SCAEF) : ❖ Key Project Contacts: Mr. Badan Lal Nyachhon, President Mr. Keshab Kunwar, Vice President Mr. Rajesh Thapa, General Secretary
Business Organizations	***Federation of Chamber of Commerce and Industries*** ❖ Key Project Contacts: Mr. Pradeep K. Shrestha, President

Professional Societies	❖ ***Nepal Engineers' Association*** Key Project Contacts: Mr. Hari Darshan Shrestha, Secretary General
	❖ *Nepal Geological Society* Key Project Contacts: Mr. Ramesh Aryal, President
	❖ ***Society of Nepalese Architects*** Key Project Contacts: Mr. Uttam Shrestha, President
Municipality	❖ ***Kathmandu****:* Key Project Contacts: Mr. Keshav Sthapit, Mayor Ms. H. D. Ranjitkar, Chief, Disaster Management Mr Bishnu Bikram Shah, Ward No. 34 Disaster Management Committee
	❖ ***Bhaktapur:*** Key Project Contact: Mr. Prem Suwal, Mayor
	❖ ***Lalitpur:*** Key Project Contacts: Mr. B. R. Bajracharya, Mayor
	❖ ***Madhyapur:*** Key Project Contact: Mr. Madan K. Shrestha, Mayor
	❖ ***Kirtipur:*** Key Project Contact: Mr. Heera Kaji Maharjan, Mayor Mr. Ramesh Maharjan, Deputy Mayor
International Organizations	***United States Agency for International Development*** ❖ Key Project Contacts: Mr. William S. Berger, Regional Advisor, OFDA Mr. Santosh Gyawali, Deputy Exe. Officer, USAID- Nepal Mr. A. S. Dasgupta, Program Coordinator, RUDO/ South Asia
	United Nation Development Program ❖ Key Project Contacts: Mr. Man B. Thapa, National Program Manager, Disaster Management Program
	❖***United Mission Nepal*** Key Project Contacts: Mr. Murari Binod Pokhrel, Director Disaster Response Program
	United Nations Educational for Scientific & Cultural Organization (UNESCO*)* ❖ Key Project Contacts: Mr. Yoshiaki. Kitamura, Resident Representative
	World Health Organization : ❖ Key Project Contacts: Mr. Erik Kjaergaard
	❖ ***Lutheran World Federation*** Key Project Contacts: Mr. Allen Armstrong, Executive Director Ms. Bimala Rizal, SEAT Coordinator

Technical Support:	**Scenario and Action Plan Component**
	Department of Housing and Urban Development Department of Mines & Geology Department of Archeology Department of Roads Nepal Police Royal Nepal Army Tribhuvan International Airport Juddha Fire Brigade Nepal Telecommunication Corporation Nepal Electricity Authority Nepal Water Supply Corporation Nepal Timber Corporation Kathmandu Metropolitan City Lalitpur Sub-Metropolitan City Bhaktapur Municipality Madhyapur Municipality Kirtipur Municipality Nepal Red Cross Society Rastriya Beema Sansthan Sagarmatha Insurance Company Bir Hospital Patan Hospital Bhaktapur Hospital Infectious Disease Hospital TU Teaching Hospital Birendra Army Hospital Birendra Police Hospital Maternity Hospital Kanti Children Hospital Kathmandu Model Hospital Medicare National Hospital & Research Center
	School Earthquake Safety Component
	Ministry of Education Central Regional Education Directorate District Education Offices of kathmandu, Lalitpur and Bhaktapur Districts Dr. A.S. Arya, Professor Emeritus, Roorkee University
	Earthquake Safety Day – 2000 Ministry of Home Affairs Ministry of Health/Epidemiology Disease Control Division Royal Nepal Army Nepal Police Department of Mines & Geology/Nepal Seismology Center Department of Building Nepal Bureau of Standard and Metrology Disaster Prevention Technical Center (DPTC) Department of Housing and Urban Development

	Deprtment of Soil Conservation and Watershed Management & JICA Disaster Management Program Kathmandu Metropolitan City Kirtipur Municipality Building and Construction Improvement Program, Pakistan Indonesian Urban Disaster Mitigation Program, Indonesia Lutheran World Federation –Nepal United Mission to Nepal/Disaster Response Program Health Care Foundation/national Kidney Center Nepal Geological Society Kathmandu 2020 Nepal Scouts School & Community Health Project/ JICA Panchakanya Steel Industries Ltd. Harisiddhi Brick Factory Ltd. Hama & Steel Industries
Training:	Nepal Administrative Staff College (NASC)
	Institute of Engineering (IOE)
Information and Networking:	Ministry of Science &Technology Ministry of Home Nepal Police Disaster Preparedness Network (DPNet) Nepal Engineers Association Society of Consulting Architectural and Engineering Firms (SCAEF) Nepal Geological Society Institute of Engineering
Policy Development:	Cabinet of Ministers Secretariat National Planning Commission Ministry of Science & Technology Ministry of Home Ministry of Education Ministry of Housing and Physical Planning Ministry of Health Nepal Police Royal Nepal Army
	NSET-NEPAL GeoHazards International (GHI)
Project Contacts:	
NSET:	Mr. Shiva Bahadur Pradhanang, Project Principle Mr. Amod Mani Dixit , Project Co-Director Mr. Mahesh Nakarmi, Project Co-Manager
GHI:	Mr. Brian Tucker, Project Co-Director Ms. Laura Dwelley-Samant, Project Co-Manager
OFDA/USAID & USAID-Nepal:	Mr. William S. Berger, Regional Advisor, OFDA Mr. Santosh Gyawali,
RUDO-SA/USAID :	Mr. A. S. Dasgupta, Project Management Specialist, RUDO/SA

Project Contacts

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The **Asian Urban Disaster Mitigation Program (AUDMP)**, launched in 1995, is the largest regional program of ADPC. The program, with core funding from the Office of Foreign Disaster Assistance of the United States Agency for International Development, will ultimately work in ten or more countries of the region. The program was designed to make cities safer from disasters. The goal of the AUDMP is to reduce the disaster vulnerability of urban populations, infrastructure, critical facilities and shelter in targeted cities in Asia, and to promote replication and adaptation of successful mitigation measures throughout the region. Towards this end, the program develops and supports national demonstration projects, information dissemination and networking activities, and policy seminars and professional training in the target countries of Bangladesh, Cambodia, India, Indonesia, Lao PDR, Nepal, Philippines, Sri Lanka, Thailand and Vietnam.

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

For more information, please get in touch with us at the following address:

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