

# Experiences on Implementing Community Based Multi Hazard Disaster Risk Reduction Programs in Nepal

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## **SUMMARY:**

The Topography of Nepal ranges from about 60 m to the highest peak of the world Mount Everest. This variation occurs within less than 150 km. Further Nepal sits astride the boundary of Eurasian and Indian Tectonic Plates. These geophysical conditions have made Nepal prone to multi hazard disasters. Flash floods, debris flow, fire; epidemics are more frequent which occur almost every year. Nepal ranks 6<sup>th</sup> on the risk of disasters due to climate change, 30<sup>th</sup> and 11<sup>th</sup> regarding water induced disasters and earthquakes respectively. Earthquakes are not as frequent as other disasters but more devastating.

National Society for Earthquake Technology - Nepal (NSET) has been implementing earthquake risk reduction initiatives in Nepal since 1998. In the recent years NSET has widened its activities to cover multi hazard risk reduction at the community level. Outcome of Community Based Disaster Risk Reduction initiatives of NSET have been promisingly positive.

*Keywords: Community based disaster risk management, Earthquake risk reduction*

## **1. INTRODUCTION**

Nepal is prone different natural hazards because of its specific geo-physical condition and contrast climatic variations in short distance. In terms of the risk to various disasters Nepal ranks 6<sup>th</sup> on the disasters related to climate change, 11<sup>th</sup> on earthquake and 30<sup>th</sup> in water induced disasters. Further Kathmandu the Capital city has been ranked as number one city in terms of earthquake risk. The huge loss of lives and properties are mainly attributed due to the low level of earthquake awareness and preparedness of people and communities. The risk of loss in the future earthquakes is also very high mainly due to the existence of unsafe buildings, unplanned and haphazard urban development, and low level of earthquake awareness of the people, communities and authorities leading towards low level of earthquake preparedness. In addition, Nepal is also prone to many other disasters mainly frequent flash floods, landslides, fires, epidemics etc.

Neighborhoods and communities are the first ones to help each other during any major disaster situation including earthquakes. Recent experiences have shown that systematic awareness and preparedness at the community levels will significantly contribute to reduce the risk. Realizing this, National Society for Earthquake Technology-Nepal (NSET) has been working with different sector of societies since its establishment in 1994 with the mission to make the Nepalese community safe from earthquake by 2020. Community based earthquake risk reduction program is one of the programs targeted to communities as a bottom-up approach. NSET has been implementing different community based programs in rural and urban communities of Nepal. The program covers communities which are facing disasters like fire, flash floods, landslide, debris flow, frequently and devastating earthquakes do not occur as frequently as these regular disasters. At the initial stage NSET was implementing earthquake focused program and these years, it has widened its activities so as to make it multi hazards risk reduction program in the communities. The lessons are very encouraging; communities have accepted the idea of CBDRM and highly motivated towards actively implementing such initiatives.

This paper provides a glimpse of community-based multi-hazard risk management initiatives implemented in Nepal, the methodologies and innovativeness of approaches, the lessons learned and the reasons of their success and sustainability.

## 2. MAJOR CBDRR PROJECTS of NSET

NSET started community based disaster risk reduction initiatives with earthquake risk reduction initiatives in ward number 34 of Kathmandu Metropolitan City in 2001. This program seemed to be very much promising at the initial stage. The activities could not be sustainable as it was fully supported by NSET and was not owned by the local authority.

The lessons from the first initiative were applied in ward number 17 to carry out similar intervention with the partnership of the ward authority and local rotary club in 2002. NSET clearly mentioned that it would facilitate them to work for earthquake risk reduction. The local committee then required to active in carrying out the works independently after a couple years of technical input from NSET. This model worked better and 17 wards Disaster Risk Management Committee is active from its inception till date.

NSET then started to replicate the CBDRM initiatives in other communities with improved implementation strategy from the lesson learned. There was an acute need to cover multi hazard disaster risk reduction initiatives as the community people were facing frequent disasters like epidemics, fire, flash floods and landslides every year where as earthquakes have a long return period with heavy devastations as compared to other disasters. The following table shows some of the major Community Based Disaster Risk Reduction Projects conducted with the financial support and partnership with various national and international agencies.

**Table 2.1.** Major CBDRR Projects of NSET

Project / Key Objectives	Geographical Coverage	Duration	Supporting / Partner Organizations
Kathmandu Valley Earthquake Preparedness Initiatives (KVEPI).  Enhance earthquake preparedness capacity of five municipalities of the Valley by prepositioning of light search and rescue kits and producing community volunteers.	10 selected Wards within 5 municipalities of Kathmandu Valley.	2003 to 2005	American Red Cross Nepal Red Cross Society
Community Based Disaster Management Program (CBDRM) UNDP NEP -005- 01.  Enhance existing capacity to deal with disasters of the local community through model mitigation works.	3 ward each of Kamalamai, Malangwa, Hetauda, Bharatpur, Vyas and Syangja municipalities.	April 2006 to December 2008	United Nations Development Program Nepal (UNDP-Nepal)
Municipal Level Disaster Risk Identification Reduction Program (MDRIP) in Nepal.  Strengthen Disaster Risk Management Capacity of Ilam and Panauti Municipalities	Ilam and Panauti Municipality	March 2008 to February 2009	Global Risk Identification Program
Community Based Disaster Risk Management in Nepal (CBDRM-N) AS-NEP 002- 10)  Create awareness and strengthen capacity of three communities to conceptualize, formulate and implement disaster risk reduction and preparedness initiatives.	Alapot VDC, ward number 18 of Kathmandu Metropolitan City and ward number 12 of Lalitpur Sub-metropolitan city.	July 2010 to December 2011	Lutheran World relief



**Figure 1.** DRMC Members on an exchange visit Narayani River Training Works/CBDRM UNDP 005-01.



**Figure 2.** Observers check the endurance limit of an earthquake Resistant Model. The Earthquake Resistant Building was not damaged when the ordinary one collapsed when tested on the Shake Table / MDRIP.



**Figure 3.** Executive Director of NSET Mr. AM Dixit handing over the keys of the Community Level Light Search and Rescue Kits to CDRMC Chairperson Mr. Subodh Kkadka in the workshop organized to finalize the Disaster Risk Reduction Master Plan at ward num 18 KMC / CBDRM-N AS NEP-002-10.



**Figure 4.** Non Structural mitigation works and safe evacuation during the earthquake drill in Min Nath Lower Secondary School at 12 ward LSMC CBDRM-N

### **3. PROJECT IMPLEMENTATION STRATEGY**

NSET has come up with a three pronged implementation strategy consisting of Institutional Development, Capacity Building and Demonstration. Networking with the local national and regional organizations has been also tried to enhance the sustainability of the disaster risk reduction endeavors.

#### **3.1 Institutional Development**

A local level Disaster Management Committee is formed by the concerned local authority with the participation of the local people in each community. The members of the committees work as a quasi-government body of the local government. This is possible as the person leading the committee is the same who leads the Municipality ward or the Village Development Committee. This is very much essential as the committee needs a perennial source of resources. This is possible only if it is well linked with the local governance system which can allocate a portion of its resources in mainstreaming disaster risk reduction to the regular development activities.

#### **3.2 Capacity Building**

The members of the Community Disaster Risk Management Committees are trained so that they can work in the disaster risk reduction and preparedness sector. Five day training on Community Based Disaster Risk Reduction is organized for the committee members in the initial stage of the project. All the activities related to the project are then conducted by the committee with the technical assistance of NSET. Further the committees then organize all or some of the following awareness and training programs as per the project guidelines for the community volunteers to build the capacity of the DRMC.

- Half day Orientation Program on Disaster Risk Reduction and Preparedness.
- Hazard Vulnerability Capacity Assessment Training (3 day)
- Earthquake Resistant Construction Technology for Masons (5 day)
- Earthquake Risk Reduction and Preparedness for Housewives (3 days)
- Earthquake Risk Reduction / Community Light Search and Rescue (4 Days)

Each DRMC mobilizes the trained volunteers to conduct the Hazard Vulnerability and Capacity Assessment of its communities. This data is then processed and used to prepare a disaster risk management master plan for the community. Committee prepares such master plans with the technical input from NSET. The plan is then implemented in an incremental manner. The project also

facilitates the DRMC to procure and preposition light search and rescue kits at the required strategic locations of each project communities as a part of capacity building.

### 3.3 Model Demonstration

The DRMC is facilitated to plan and implement some of the priority actions from the master plan prepared for the community. Such actions vary according to the timeline and the resources available during the project. Some of the example are painting the earthquake response plan on the wall of the school, small scale non structural mitigation in the CBDRM and or Local Government premises, bamboo diversions and bamboo retaining walls for river training works and landslide protection and an earthquake resistant model Building within the community.

In addition to these three strategies the DRMCs also are being associated with the local, national as well international networks to share experiences and learn from each other. These strategies has contributed to technology transfer which enable the DRMCs to conceptualize, formulate, plan and implement various risk reduction activities at the local level. The DRMCs are conducting awareness sessions, training programs, preparing community based disaster preparedness and response plans. The best part of this process has been that the DRMCs learn the entire process while implementing the activities. The “learning by doing process” has proved to be one of the best ways of transfer of skill including the detailed processes.

## 4. IMPACT

Implementing any project in a Community Based Participator Approach enables to involve maximum number of community members in the project. Thus the project does not become just another result objective oriented project but it will be a process oriented activity owned by maximum stakeholders within the community. The following table puts the fact that in one of the projects implemented in partnership with three local communities of Kathmandu Valley has involved 13 to 24 percent % of the total population of the entire community.

Sn	Project Activities	Number of Community Members Directly involved in the project activities.			
		ALAPOT	KMC 18	LSMC 12	TOTAL
1	Community Awareness Programs	124	183	145	452
2	DRM Training for five days	7	8	9	24
3	HVCA Training for three days	30	28	24	82
4	Awareness Programs at Schools	100	120	300	520
5	Earthquake Response Exercise (Drills)	70	100	120	290
6	Awareness programs at Health Centre	50	30	20	100
7	Masons Training for five days	30	23	37	90
8	ERR/CLSAR Training for four days	30	30	30	90
9	School Centred Community Disaster Preparedness Plan	100	120	300	520
10	Health Centred Based Community Disaster Response Plan	50	30	20	100
	Total number of members involved directly	591	672	1005	2,268
	Total Population of the project communities	2,500	5000	7,500	25,000
	Percentage of directly involved community members	24%	13%	13%	15%

The possibility of the community taking the ownership and responsibility of implementing the activity is considerably increased. The more people get involved in the project activities the more people learn something and motivate others to get involved.

Different socio cultural organizations (*Guthi*) have been organizing disaster risk reduction awareness and orientation programs with technical support from NSET. These Guthi, the socio cultural organizations have been instrumental in disseminating information provided during the awareness and orientation programs. Some of the scholars associated with one or the other Guthi are have been

translating the presentation materials of the orientation program into local Newari language and presenting it in their cultural or religious gatherings.

The effectiveness of the training and or orientation programs aimed at the housewives has been more effective in terms of implementing non structural mitigation measures at the household level. Such programs aimed at the housewives have resulted in making many houses safe in terms of non structural hazards.



**Figure 5.** The trainee housewives learn to assemble the telescopic clamp used for non structural mitigation and on the right they are in an exposure visit to a construction site.

There has been some inspiring impact at the local government sector despite the adverse political scenario prevailing in the country. The adjoining wards and village development committees have been requesting NSET and demanding District Development Committee to conduct the risk reduction activities in their communities. Almost all the wards adjoining ward number 17 and 18 of Kathmandu Metropolitan city has initiated to conduct the disaster risk reduction activities by formulating ward level disaster risk management committees. Similarly Kathmandu District Development Committee has initiated formulating plans to replicate the disaster risk reduction initiatives in Alapot to the remaining 57 Village Development Committees in the future.

Implementing of National Building Code in Dharan, Ilam Hetauda and Vyas municipality is another example of positive impact resulting from Community Based Disaster Risk Reduction initiatives of NSET. Khandbari, Dhankuta, Itahari, Kirtipur, Bidur and Butwal Municipalities have already requested NSET to support them in the implementation of National Building Code.

## **5. FINDINGS**

The following are the findings and or lessons learned from the experience of implementing various community based disaster risk reduction programs by NSET.

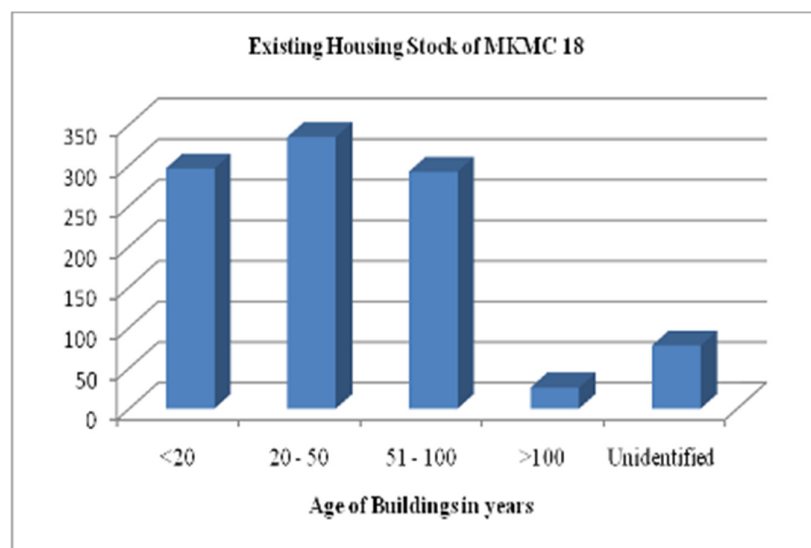
### **5.1 Continuous mass awareness campaign**

The awareness level of urban communities regarding the importance and effectiveness of disaster risk reduction is rapidly increasing as compared to that of the rural areas. But the increased awareness is not yet enough to motivate them to act for disaster risk reduction.

### **5.2 Promotion of Retrofitting Technology**

The seismic vulnerability of the existing housing stock in core city areas of Kathmandu Metropolitan City and Lalitpur Sub-metropolitan City has considerably increased due to the low maintenance of old

buildings and weak implementation of National Building Code. Further the buildings constructed before 40 years (1970) have brick masonry walls and timber for floor and roof structures making them equally vulnerable to fires.



**Figure 6.** Existing housing stock of Ward number 18 of Kathmandu Metropolitan City

**Table 5.1.** Estimated loss in Alapot, 18 ward of KMC and 12 Ward of LSMC corresponding to the scenario earthquake

Location Estimated loss	Earthquake magnitude, distance depth and assumed time of event			
	7.6 M at 37 away km and 20 km deep		8.4 M at 300 km away and 20 km deep	
	Day	Night	Day	Night
Alapot				
Building Damage		238		
Human Injury	404	867	73	
Human Death	80	182	10	
Ward 18 KMC				
Building Damage		371		489
Human Injury	792	1634	1149	2371
Human Death	103	208	177	358
12 Ward LSMC				
Building Damage		297		
Human Injury	420	1032	73	
Human Death	84	207	10	

### 5.3 Involve Local Government

The implementation strategy adopted by NSET has well recognized the importance of local government in making disaster risk reduction initiatives sustainable. All the concerned leaders and officials of the local government will take the ownership of the programs if they are explained well about the importance and effectiveness of the activities.

NSET activities have boosted municipal efforts towards building code implementation. Although implementation of the national building code has been declared as mandatory for municipalities of Nepal, the municipalities do not have much idea about the modus operandi of building code

implementation. They do not have proper strategy, and hence confidence, of conforming to the central government's decree. More and more municipalities are requesting NSET for the technical input to initiate building code implementation. Although full impact of the building code implementation would be seen and felt in years to come, there has been a significant change in the mind set of people as well as of the authorities and the technicians on the need and possibility of code compliance.

#### **5.4 Use Simple Language**

Usually, people do not know what to ask for with the disaster managers and the disaster managers do not know what and how to advise the people because of low level of knowledge and awareness with both. NSET Projects, apart from conducting hazard and risk assessment, also provided opportunities for everyone to learn things in simple language. Every day of the field work in the municipalities was a learning day for all: the municipal officials and technicians earned the complicated processes of disaster risk reduction while the project team members learned on the best method of approaching and transmitting and internalization of the knowledge.

#### **5.5 Honor Indigenous Wisdom**

PVA process helped identify the existing situation on hazards and vulnerability, and also several possible counter-measures for disaster reduction. This helped much in identification of the level and types of risks and the corresponding mitigation measures. That provided the required foundation not only for effective action planning but also ownership of the risk assessment and action planning process and results by the communities and residents. While disaster risk reduction is a long-term and challenging task, however, respect of local wisdom and local indigenous technologies creates better psychological environment for DRR.

#### **5.6 Be Transparent**

Implementation of the project under condition of a lack of elected representatives to the municipal and ward councils could be achieved due to the transparent and all-inclusive approaches adopted in all activities of the project including its financial aspects. Everybody involved in the process were given opportunities for voicing their concerns at any time of the field works including during the awareness raising, training and workshop programs. Presence of representatives of all political parties and government offices together with those of the academia and civil society and private businesses could help propagate the message that disaster risk reduction is a task that transcends all political or social difference.

#### **5.7 Cost Effective and Replicable**

NSET experience from completed projects resulting in the approaches and methodology employed was appreciated in both the local authority and general public of all walks of life. For NSET, the biggest achievement was that all stakeholders in the municipalities have been exposed to new methods of DRR, their awareness level heightened, and interest generated to the extent that the municipalities started visualizing more roles for themselves and lesser with time role for NSET. While NSET needs to continue providing technical support to the municipalities at their request, all the technical agencies, especially the government and local non-government organizations have been empowered with knowledge and methods of risk identification and mitigation.

#### **5.8 CBDRM Should be “Community Paced”**

Three year project period has been found to be optimum in carrying out all the necessary project activities related to Disaster Risk Reduction so that the community can take it in every aspect of process documents and technology transfer.



## **5.9 Develop Simple risk assessment Tool**

Rapid risk assessment tools are very much effective in convincing the community as well as the local authority to initiate risk reduction activities. Tools to assess the risk associated with epidemic, fire, flood, and landslide disasters could be developed like the RADIUS which is widely used for estimating losses from earthquakes.

## **6. CONCLUSION.**

Normally the committees sitting to prepare plans tend to make over ambitious plans which create a negative perception to the planners as well as the users as it is very difficult to implement larger activities in the local level. The disaster risk assessment and action planning for disaster risk reduction at the local level only really work if the committees are facilitated to make specific, measurable, achievable, rational and time bound (SMART) objectives and action Plans.

The strategy adopted and project procedures for Disaster Risk Reduction Initiatives by NSET has ever been improving and showing better results. This has been possible because of the cooperation from the local government and the local community. Further the cooperation extended by various national and international agencies in implementing these programs is also equally important.

The procedures developed by NSET has been adapted and used by other organizations working in disaster risk reduction. It is very much clear that all the 4000 Village Development Committees should be facilitated to form Village level Disaster Risk Management Committees and implement the Disaster Risk Reduction Activities in each village to make the Nepali community resilient to disasters.

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