

Enhancing Earthquake Resilience of Communities: An Action by Women's Groups in Nepal¹

Nisha Shrestha, Department of Monitoring and Evaluation, National Society for Earthquake Technology (NSET), Lalitpur Metropolitan City, Nepal,

With Surya Narayan Shrestha, Bhubaneswari Parajuli, Amod Mani Dixit, Bijay Krishna Upadhyay, Om Kala Khanal and Khadga Sen Oli, at the National Society for Earthquake Technology (NSET), Lalitpur Metropolitan City, Nepal

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Community, Capacity building, Disaster risk reduction, Earthquake risk mitigation, Resilience approach, Women's empowerment

This paper forms part of the DRR2DEV programme including a range of case studies, discussion and analysis and inviting further participation in thinking critically about how to do development differently and better.

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Summary

Nepal is exposed to frequent seismic events. There is increasing awareness that risk reduction needs to take account of smaller scale events as well as major ones. There is a felt need for promoting Disaster Risk Reduction (DRR) action at community level, promoting existing community cohesion for use in disaster preparedness, and replication of positive experiences. Involvement of women and women's networks has been identified as one of the effective way to motivate and mobilize communities to reduce disaster risks and enhance disaster preparedness.

NSET's experiences of supporting and developing the capacity of women's groups to undertake non-structural mitigation (NSM) illustrates how women's groups can play a very significant role in risk reduction at community level.

This cases study records the experience of the women's group of Chandragiri Municipality in Kathmandu Valley using their NSM learning in their own houses to reduce vulnerability. They started vulnerability reduction with their own kitchens and bedrooms by fastening their cupboards, frames, freezers, gas cylinders etc. This led to implementing the mitigation measures in their locality as well

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[Nisha Shrestha](#), [Surya Narayan Shrestha](#), [Bhubaneswari Parajuli](#), [Amod Mani Dixit](#), [Bijay Krishna Upadhyay](#), [Om Kala Khanal](#) and [Khadga Sen Oli](#) (2019) "Enhancing earthquake resilience of communities: an action by women's groups in Nepal", [Disaster Prevention and Management](#), Vol. 28 No. 1, pp. 84-92

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as outside their community. The group was trained by NSET on carrying out non-structural mitigation in 2012.

This has been a step towards achieving a safer community through safer houses and schools. It has developed understanding of the process, scientifically and systematically, and boosted their confidence with important new technical skills and new leadership roles in their community to mitigate the earthquake risk. The women's group are now very well supported and encouraged by their family members and have been engaged in this new income-generating activity. This has also helped to improve their social recognition and the economic status.



Context

Important themes and issues

- Collaboration and Influence
- Blending with Indigenous Knowledge
- Replication and Sustainability
- Innovation
- Fertile Land
- A small spark of external support makes a big difference

Threats and consequences faced

Nepal has one of the highest risk profiles of natural hazards in the world. Beside frequent seismic events in Nepal, people are exposed to a range of hazards, large and small, and also social, cultural, economic and physical vulnerabilities. These include risks from living in a multi hazard environment, that includes both disaster events, including earthquakes, fire, urban flooding; and issues contributing to vulnerability, of which foremost poverty and associated conflicting priorities for meeting basic needs such as health, education, nutrition, shelter. There is high physical, social and cultural vulnerability, compounded by fatalism and no change in mind-set based on 'orthodox' views about the risks, and overall, a low level of awareness on DRR, low disaster preparedness, and poor capacity to handle extensive (everyday small and frequent) disaster risks.

These threats result in a range of consequences:

These multifaceted disasters can lead to loss of lives and property and have a severe impact on people's everyday life. In a developing country like Nepal they can trap the people in a cycle of poverty, more people will be going below poverty line as they do not have the resources to rebuild their homes and meet other basic needs, making them less able to recover in the long run.

Another most immediate effect of disaster is the population displacement and migration. When hit by earthquakes or other events many people may have to abandon their homes and seek shelter in other regions and countries. Other human factors influence the severity of disasters; even within the same region, different people have different level of vulnerability to disasters, which may lead to loss of social cohesion. Lack of planning and disaster preparedness by both local government and household, may lead to panic response leading to difficulty in handling post-disaster situations ultimately leading to erosion of confidence.

Barriers to action

These include low level of awareness resulting to lack of preparedness and confidence to handle extensive (everyday small and frequent) disaster risks. Of them all, the foremost barrier is the poverty and associated conflicting priorities for meeting basic needs, and also, there are both material and governance issues. Non-engineered buildings dominate, as do risks related to non-structural elements (for example, domestic objects that can fall and cause injury), and a low priority is placed on disaster preparedness by both local government and households, that is compounded by the lack of conducive policy and legal environment.

Local actors

A group of women volunteers, mainly housewives who were the members of Thankot Mahila Jagaran Bachat Tatha Rin Sahakari (a women's cooperative) are the implementer of the risk reduction works. 9 schools located in Chandragiri Municipality and two other schools in another municipality were the implementing organizations, along with some households within the

community. School children, teachers and other staff of the school got benefitted from the activity. The activity was supported by NSET and other CSOs like LUMANTI and ENPHO.

Actors impeding progress:

- Some landlords, and absentee landlords and developers

The Case Study

Background

Nepal has suffered great human casualties and property loss from the past earthquakes. A major cause is the collapse of structures. However, disaster risk including earthquakes can be minimized by risk mitigation measures. Earthquake-resistant construction technology for new construction and strengthening of the existing buildings are the most effective strategies to reduce the seismic risk. Non-structural mitigation (NSM) and preparedness for emergency response are other important aspects for community resilience. Realizing this, various efforts from awareness-raising to policy improvement have been initiated in Nepal by the government, non-government agencies and many other stakeholders.

Involvement of women and women's groups and networks is one of the effective ways to motivate and mobilize communities to reduce disaster risks and enhance disaster preparedness. Female population in Nepal is slightly over fifty percent, and is an important community group. Research shows that women are sincere, honest and committed towards their responsibilities. Experiences also reveal that where women's groups are mobilized they become more effective. Women also play an important role in construction; they are directly engaged in house repairs, adding additional floors or in the construction and purchase of a house, and furnishing it, etc.

Moreover, many women's groups have been formed in recent years and they are found working very effectively and efficiently in various social sectors. However, risk reduction activities have somehow not been able to focus on women nor mobilise any women's group. Organizations working in disaster risk reduction have felt a need to expand DRR activities involving and targeting such women's groups. This called for a collaborative approach among organizations initiating a dialogue among NSET, Lumanti and other women's organizations and networks such as Community Women Forum (CWF) of Chandragiri Municipality and Kirtipur Women's Group (KWG) to work together on various aspects of disaster risk mitigation and preparedness, leading to the formation of a National Network of Women on Community Resilience (NNWCR) to work together on DRR activities at community level.

The Initiative

The members of NNWCR carry out different DRR activities under this initiative to expand earthquake preparedness and mitigation activities at grassroots level involving and targeting women's groups.

The goal was to make communities safer from earthquake risks through awareness, capacity building and implementation of earthquake-resistant construction, non-structural mitigation and preparedness measures. A number of activities such as orientation programs, Training for Trainers (TOT), Door to Door campaigns for promoting earthquake safety, assessment of non-structural vulnerabilities, implementing non-structural mitigation, production and promotion of earthquake survival bag or the 'Go Bags' comprising Emergency Household Kits and Non-structural Item Kits etc. Production and promotion of such items and kits in collaboration with local government were

conducted towards this direction eventually making the disaster resilient community a reality. Non-structural mitigation (NSM) is one of the women led initiatives for community resilience.

Overall with the support of NSET and partners, two women's groups of Kirtipur and Thankot and two community disaster management committees in Kathmandu and Lalitpur districts have participated in NSM activities in 82 households, 46 schools and 4 hospitals; and 113 people have had training of trainers and on the job training, and 6,256 people have benefitted from awareness raising.

Buildings contain structural and non-structural components. Structural component are those parts that carry self-weight and external load such as beams, columns, load bearing walls, slab, foundations. Parts of the building other than structural component which do not take load of the building, but which are needed for the function of the building are non-structural component of the building include

- *Architectural components:* Partitions, ceilings, doors and windows, lighting systems, parapets etc.
- *Building Utility Systems:* Water, gas, electric and sewage piping and conduits, chimney, mechanical and electrical equipment and distribution systems, solar panels, elevators etc.
- *Building Contents:* Shelves, cabinets, furniture, computers library stacks, kitchen and laundry facilities etc.

Why Non-Structural Mitigation?

- Earthquakes are not always big. Even in small shaking events the non-structural items can cause to loss of life, loss of property and loss of functionality of critical services
- Structural mitigation requires large budgets, which may not be possible in short time. Non-structural mitigations can be done at very low cost sometimes even at no cost
- NSM is a doable action as it involves a simple technology. Even the housewives can do it easily.
- Changing the mind-set to “we can do it” and inculcating the culture of safety is important. NSM can be a doable start for this.
- Its effectiveness has been tested in 2015 Gorkha Earthquake.

The Chandragiri Women's group work on non-structural vulnerability reduction: Continuation of the Initiative through the Frontline Program

Chandragiri Municipality in Kathmandu is one of the communities where the women's group has been constantly working towards enhancing the preparedness of the communities.

The members of the women's network were also actively involved in the Views from the Frontline program² since 2011, 2013 and the 2015-16, and Frontline program 2015-2017 emphasising local action and learning, coalition building and coordination.

Chandragiri Municipality is one of the program areas to conduct the Frontline activities supported by NSET and GNDR, among the 6 different risk zones selected across Nepal. Chandragiri Municipality is located within Kathmandu Valley in the Bagmati Zone in Central Development Region of Nepal.

² See Paper 2 in the journal about GNDR and the VFL programme

The earthquake risk of Kathmandu Valley is very high and is increasing alarmingly due to rapid urbanization, poor construction practices, and lack of awareness and preparedness. Located in a highly seismic hazard region, Kathmandu Valley has experienced several devastating earthquakes in the past. In Nepal, Community Based Disaster Risk Reduction (CBDRR) efforts are crucial to reduce the risks faced by the country.

Chandragiri Municipality is still not much developed despite its location close to the capital city. The municipality faces the risk of fire, earthquake, landslide, epidemics, and flood (NSET/DesInventar 2015).

With support from GNDR, the Frontline program was implemented in 6 different risk zones located in different physiographic regions of Nepal, such as (Humla and Kailali districts in the Western Region; Saptari and Triyuga in Eastern Region; and Dolakha and Chandragiri municipality in Central Region of Nepal). Key factors while considering risk zones were geographic location, accessibility, exposure to risk, urban vs. rural realities and country risk profile.

Women are crucial for adopting the risk reduction technologies for their household and spreading good practices within their communities. During the Frontline survey, the community identified earthquake as the top threat in the community and non-structural mitigation as one of the priority actions.

The women's group of Chandragiri Municipality implemented their learning in their own houses to reduce non-structural vulnerability, starting vulnerability reduction with their own kitchens and bedrooms, fastening their cupboards, frames, freezers, gas cylinders, hanging objects etc. Prior to this they received hands-on training on Non-Structural Mitigation conducted by NSET in 2012.

Leveraging on prior knowledge and experiences, members of the women's network started conducting non-structural mitigation works in their community, leading to implementing mitigation measures in their locality and outside their community. They have conducted mitigation works in 10 different schools in Kathmandu, Lalitpur and Bhaktapur, in some health posts and also in one of the hospitals.

Non-structural mitigation works improve, strengthen, or brace the non-structural building elements to reduce damage, economic losses and casualties in earthquakes. Non-structural mitigation works are very effective in mitigating (reducing or eliminating) a high level of seismic risk and yet are very cost-efficient. Household and families can implement this by themselves with very small technical inputs from experts. Realizing the high risk of earthquake and the possibility of local level risk reduction efforts (also indicated by the Frontline results), the members of the women network are advocating for earthquake safe communities and implementing the risk reduction measures.

Key activities are as follows:

- The Frontline survey conducted in the four communities of the municipality during August 2015
- Results identified earthquake as one of the top threats; and identified non-structural mitigation as one of the community level actions that can be undertaken
- A group of women from the municipality were already trained on carrying out non-structural mitigation works through NSET in the year 2012
- The trained women formed a group and started advocating on the need of risk reduction works

- The group started advocating to the local government for allocating some fund for DRR and implementing non-structural mitigation works in the community. Local government endorsed the initiative and assured for its integration into the Local Disaster Risk Management Plan (LDRMP) as well as the annual program of the municipality.
- The group started convincing the School Management Committees and started implementing non-structural mitigation works in the schools
- This initiative generated support and buy-in from other organizations also.

The appreciation they received from their family members and the neighbourhood on their work was the foundation of their endeavour of carrying non-structural mitigation for earthquake preparedness. After the 2015 Gorkha earthquake, the effectiveness and importance of fixing non-structural elements in a house was even clearer to the communities.

Activities engaged a wide range of actors: A group of women volunteers; housewives who were the members of the cooperative are the implementers of the risk reduction works. Nine schools located in Chandragiri Municipality and two schools in another municipality were the implementing organizations, along with some households within the community. School children, teachers and other staff of the school benefitted. It was supported by NSET, LUMANTI and ENPHO.

Building on the prior knowledge, experiences and strong relationship shared between the women's network and NSET, the NSM trained members of the Cooperative network formed a team of eight members to initiate non-structural mitigation works in the community.

With technical assistance from NSET, the group started fixing the non-structural elements in their homes. This first step enhanced their skills and boosted their confidence, and they started advocating for risk reduction in their community. The group then went to the schools in their community; after convincing the School Management Committee, the group started implementing non-structural mitigation works in the schools. They have conducted mitigation works in 10 different schools of Kathmandu, Lalitpur and Bhaktapur, some health posts and also in one of the hospitals.

Ms. Bindu Shrestha, President, Thankot Mahila Jagaran Bachat Tatha Rin Sahakari

"We discussed and identified the four at-risk-communities of Thankot. We implemented NSM in 9 schools inside our municipality. We had skills, we had contacts but we were lacking in equipment for carrying out NSM; so through the Frontline program we got the required drill machine and we carried out the mitigation measures in schools.

When we went to the school, their first reaction was 'why is the women's group here?' How will they fix the items? They had no confidence on us, but when we went there with our equipment (drill machine, hammer, jack saw, etc.) and fastened the cupboards, shelves, notice board of the school in front of them, they were amazed by our work. They appreciated us and told us that they had not expected women could do this, and they further said that they have been disseminating information, publications on earthquake safety but actual implementation was not done so far.

We gained the skills through the training which perhaps would remain in our head only if there was no practical implementation, but through Frontline we could actually implement it in reality, in fact we could generate money through this."



Figure 1: Women's group in Action: Fastening the cupboards inside the school library.

Outcomes of the activities

This initiative has been a step towards achieving a safer community through safer schools and safer houses, helping to acquire a better understanding of the process, scientifically and systematically.

The women's group is now competent and able to perform the activities such as drilling walls to tie up cupboards etc.; previously jobs done only by men. This initiative has boosted their confidence,

empowered them with important new technical skills, and new leadership roles in their community as they are actively contributing to mitigating earthquake risk. The women's group are now very well supported and encouraged by their family members.

Women are now engaged in new income-generating activity other than regular sewing and crafting works, improving their social recognition.

The initiative has helped in translating and transferring the technical information at the household level and thus has helped to de-construct science into daily works.

This has led to a transformational change in the society, and credibility for working in DRR has been enhanced.

Challenges

The initiative is very new to the society and it takes time to get it accepted. It is still very difficult to convince house-owners on the importance of non-structural mitigation. People don't want to fasten their cupboards and furniture, and freezers and gas cylinders to the wall or the ground, they feel that this technique will ruin their furniture and this is also the case with the school management committee. Some of the challenges identified during the process were as follows:

- **Acceptance by the community:**

Initially the group was not supported by their family, and there was less trust for their work. Now with continuous efforts and dedication, their family members realize the importance of their work and are supportive to them. The group still does not get adequate support from the community people nor from the school management; the reluctance of the house owners is mainly because, according to them, non-structural mitigation measures spoil the beauty of their room.

- **Lack of Confidence and Physical Barrier:**

The non-structural mitigation involves the use of tools such as (drills, hammers, hacksaws, etc.) conventionally used by men, therefore in the beginning women were hesitant and lacked confidence to operate these tools. Further, due to lack of knowledge on proper techniques they faced difficulty while conducting the physical works such as dragging the cupboards, heavy furniture, etc.

- **Limited Know-how:**

There is a limited know-how or limited study on the technology. There has not been any quantification of safety through NSM; more research on this aspect is required.

Even for the women's group it was felt that there is a need to enhance the knowledge and skills on specific NSM tasks such as to tie the glass frames and other equipment at school labs and at homes.

This can be minimized by additional research, continuous advocacy, awareness-raising and capacity building activities. Acceptance by the community is the crucial factor which the women's group and NSET are constantly working on.

Education, awareness, motivation, training and will-power are success factors; lack of awareness and limited skills are the limiting factors identified during the implementation of the program.

Mr. Kiran Sigdel, Teacher, Bhim Higher Secondary School, beneficiary of the community implementing the non-structural mitigation works)

"I am the resident of this community and have known about the works the Women's Network has been doing. The things that even an efficient manager of the school has missed, has been identified by our sisters of the Women's group which is in fact very praiseworthy. We have not thought that the cupboards, shelves in the library, notice boards, and frames have to be fixed to minimize their loss during earthquakes. Though it is a small thing it can minimize huge loss that may occur during the shaking.

I along with my other teachers of the school am highly obliged with the Women's group for making us realize our gaps and helping us to minimize them."

Reflecting on Action

The Frontline process was designed in such a way that it did not only facilitate women to find out the top five threats but also the potential solutions to the threats. This initiative empowered the women's group with new technical skills, and new leadership roles in their community, as they actively contribute to mitigating earthquake risk. This work has been successful in attracting women, who are taking on a job traditionally done by men. Women have now been engaged in new income-generating activities apart from the regular sewing and crafting works. It has thus improved social recognition and the economic status of female community mobilizers.

Ms. Sayatri Shrestha, Housewife, Member of Kirtipur Womens Network

"I was very happy, to buy a gift for my mother on the Mother's Day for the first time with my own earned money. It was possible to me only because of my involvement in the NSM work"

The Non Structural Mitigation programme was found to have a number of benefits:

NSM is **easy to do and easier to undertake**; it is a simple doable action as it involves a simple technology. Even the housewives can fix it easily. It is easier to undertake than structural mitigation measures and can be done at a very **low cost**. These small inputs lead to high outputs during the earthquake.

It involves the local people, blends with traditional knowledge, is flexible and hence easily accepted by the community.

It contributed to the livelihood of the community as it was taken forward as an **income generating** activity by the women's group.

It was found to be **highly effective** and its effectiveness has been tested in 2015 Gorkha Earthquake.

Since this initiative is the first of its kind in Nepal, the group sees ample opportunities for expanding their area of work. It has a high potential of replicability since it is cost effective, localized and

effective as the simple techniques can reduce risks and minimize injuries, loss of life and property during earthquake.

The need now is to scale up the efforts, shift from demand-based works to developing local entrepreneurship. Additional training to enhance their skills, systematization of the process, training on budgeting and negotiating, liaison with other stakeholders, advocacy, and awareness raising activities are required to enhance and scale-up the initiative are all needed.

The Future

To achieve real transformatory change towards a 'non-structural hazard free community' the need has to be felt; and that will require awareness, education and institutionalization at campaign level. It has reached at the individual level but it is still episodic now. It still depends upon person, chance, and availability of money. But now after recent local elections, it has created a potential for favourable environment and now if the new government and local governments want to do this, they can use the experience as an example: all the background work has been done. Therefore, it is critically important to build links with the government support system and to ensure that budgets are allocated in the municipality for DRR works.

Corresponding author

Nisha Shrestha can be contacted at: shresthanisha06@gmail.com