Raising Earthquake Awareness in Kathmandu Valley: A Comparative Analysis of Achievements during 1999-2009

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SUMMARY
Because of her location astride the boundary between the Indian and Eurasian plates, Nepal faces high seismic hazard. Earthquake risk is also very high because of poor quality of buildings, lack of emergency response system, and lack of capacity for medical response, and the general lack of earthquake awareness. Raising awareness is the first step towards enhancing risk perception so as to create demand for earthquake risk reduction. The National Society for Earthquake Technology-Nepal (NSET) emphasized earthquake awareness as its prime activity since 1997 in Nepal. This paper presents a quantitative evaluation of the extent of public awareness raised in Kathmandu Valley during the period 1997-2009. The quantitative analysis is based on a comparative evaluation of repetitive surveys on earthquake risk perception conducted in 1999 and 2009 in Kathmandu Valley.
Major findings of the study are:

1. In 1999, people perceived earthquake risk similar to air or water pollution; in 2009, almost half the population considered earthquake as the greatest risk.
2. During the period of 1999 to 2009, the percentage of people considering earthquake as a problem deserving their attention grew from 54% to 68% who also considered that they would have to face a devastating earthquake during their lifetime in Kathmandu.
3. The percentage of population considering themselves informed on earthquake risk increased from 58 % to 88% in the same period.
4. There is a conspicuous demand for information and knowledge on earthquake safety in 2009 as compared to what was there in 1999; an ever-increasing number of schools are requesting NSET for technical assistance for reducing structural and non-structural vulnerabilities.
5. Earlier, people resorted to newspaper for knowledge on earthquake risk reduction whereas in 2009, more and more people get their information from television and local FM radio channels. Awareness strategy of the government and other agencies should consider such social change.

Thus, earthquake awareness in 1999 meant a fight against prevailing fatalism and ignorance on traditional knowledge and methods of earthquake safety, while in 2009 it meant use of modern technologies to widen knowledge coverage and to translate raised awareness into actions of disaster risk reduction and scaling up of all successful methods through institutionalization of the process into the regular activities of national institutions.

Keywords: Risk perception, risk reduction, awareness, training, earthquake, analysis

1. INTRODUCTION AND BACKGROUND

Located in a high seismic hazard region, Kathmandu Valley has experienced several devastating earthquakes in the past. Based on the historical records, many experts believe that a major earthquake similar to that of 1934 AD (more than IX MMI intensity) is overdue. The earthquake risk in Kathmandu Valley is increasing due to rapid population growth and high density, increasing unsafe construction practices, low level of awareness and unplanned urbanization (Guragain, 2010). According to the study carried out by the National Society for Earthquake Technology Nepal (NSET) under the Kathmandu Valley Earthquake Risk Management Project (KVERMP), an earthquake with similar level of shaking as that of 1934 AD earthquake today would result into approximately 40, 000 deaths and 95,000 injuries in the Kathmandu Valley (NSET, 1998).Guragain revised the potential casualty figures from a scenario earthquake shaking of IX MMI in Kathmandu as 100,00 dead, 100,000 critically injured and 200,000 seriously injured (Guragain, 2010).

Many initiatives have been taken by national and international organizations for the assessment of earthquake vulnerability in Kathmandu Valley (JICA, 2002; ADPC/MOHA 2009, Jimee, 2006).Many more initiatives have focused on earthquake awareness (reference to Disaster report of DPNet, NSET publications etc). As a result, a significant and positive change has been achieved in terms of peoples' awareness on cause-effect of earthquake and also on how to make oneself safer from it. A classical study made in 1998 by Elizabeth Wesson (Wesson, 1999) provides a benchmark of earthquake awareness in 1998. This study was promoted by NSET and GeoHazards International (GHI) when both the non-profits were conducting the Kathmandu Valley Earthquake Risk Management Project (KVERMP) – one of the first comprehensive programs of earthquake risk assessment and earthquake risk management in Asia (KVERMP, 1998 (scenario), KVERMP, 1998 (Action Plan) A similar study, Kathmandu Valley Earthquake Risk Perception Survey (KVERP 1999-2009) was conducted in 2009 for the identification of changes in the level of risk perception in the Kathmandu Valley. This paper presents a quantitative evaluation of the findings of the two surveys and reveals the extent of positive changes in terms of peoples' understanding of the earthquake risk and risk reduction measures. Reference is here made also to similar study conducted by NSET under the part of Global Risk Identification Program (GRIP), Japan within the valley which reveals that out of 800, a majority of responders considered that earthquake risk is most disastrous among another risk. The survey was conducted in 2007 that means the awareness and knowledge of earthquake risk is growing from the period of 1998 to 2009. There are lots of earthquake awareness program carried out by number of institutions such programs are drills, trainings, publication, interaction programs and orientation radio drama, street drama etc which pertain to enhanced the level of awareness in the valley.

2. KATHMANDU VALLEY EARTHQUAKE RISK PERCEPTION

2.1 Risk Perception Survey

Elizabeth Wesson conducted the survey as a part of her academic requirements jointly with NSET. It consisted in administering structured questionnaire interview to 1500 respondents randomly selected from uniformity distributed urban settlements in the five municipalities of Kathmandu. The purpose of the survey was to determine the level of earthquake awareness of Kathmandu Valley residents and their attitudes toward earthquake risk and risk reduction. The structured questionnaire targeted general areas for assessment: earthquake risk in perspective (relative risk perception), general level of awareness and sources of knowledge, general attitudes, responsibility for earthquake protection and mitigation, the level of interest in earthquake insurance, the level of interest in school reinforcement projects, and building reinforcement priorities. Beyond a basic understanding of earthquake risk perception in Kathmandu Valley, the results of this survey were intended to be used to assess the success of the awareness component of the Kathmandu Valley Earthquake Risk Mitigation Project and to guide future awareness raising efforts of NSET and GHI (Wesson, 1998).

The principal author conducted a repeat of the 1998 survey on earthquake risk perception for identifying changes in the level of risk perception in Kathmandu Valley, and to understand the dynamics of earthquake risk perception of the people as a result of the decade- long efforts in earthquake risk reduction programs and initiatives implemented by NSET and the Government and Non-Government institutions.

The hypothesis was that the earthquake risk management initiatives implemented in the last decade have enhanced internalization of earthquake risk perception and risk reduction in Kathmandu valley.

Changes in basic understanding of earthquake risk

In 1998, the basic understanding of earthquake risk perception in Kathmandu Valley was very low, people know that there is knowledge but it took 10 years to internalize it. The problem on knowledge management for those who has knowledge but they doesn't know where and what to deliver and those

who doesn't have knowledge they don't know where to get the proper knowledge about earthquake risk reduction measures.

The quantitative evaluation is based on a comparative evaluation of repetitive surveys on earthquake risk perception conducted in 1999 and 2009 in Kathmandu Valley. Earthquake awareness meant in 1999 a fight against prevailing fatalism, ignorance on traditional knowledge and methods of earthquake safety, and minimal access to knowledge on disaster mitigation.

3. METHODOLOGY OF KVERP 1998-2009

In both surveys, all the 5 municipalities namely Kathmandu, Lalitpur, Bhaktapur, Kirtipur, and MadhypurThimi were the targets. The surveyors were given a briefing of the survey and some guidelines on how to conduct the survey. Both surveys were done with structured questionnaire as per random sampling method and respondents were selected at random while walking door –to-door. The distribution of surveys was determined by the percentage of the valley's population residing in each municipality.

Questions were asked pertaining to their level of interest in earthquake risk reduction, their notions of responsibility for mitigation, and prioritization of some mitigation activities. Primary data was collected with the help of structured revised questionnaire. The questionnaire was originally developed by NSET in 1998 and minor revised in 2009. The Additional questions were added related to effort in disaster risk management. A selection of house was used as randomly but a priority was given to cover to at least one questionnaire of each ward of municipalities. The questionnaire focused primarily on the basic earthquake risk perception and decade long efforts towards Disaster risk reduction.

Secondary information was also collected from the study report on Kathmandu Valley Earthquake Risk Perception which was carried out in 1998, and the study report on Seismic Risk Perception of Central, Local Government officials and Masons/ contractors/ Builders in Nepal which was carried out in 2008.
The survey and analysis focused on the following selected indicators:

- Relative risk perception of Kathmandu Valley
- Attitudes towards earthquake risk in the Kathmandu Valley in their lifetime
- Awareness towards earthquake risk reduction
- Attitudes towards earthquake risk reduction
- Changing of peoples mindset in the Kathmandu Valley
- School Earthquake Safety
- Information about Earthquake Risk in Kathmandu Valley
- Willingness to strength existing building
- Willingness to invest for insurance for existing houses
- Priorities for risk perception of Kathmandu Valley
- Knowledge on Earthquake Risk Reduction

In both surveys, altogether 1500 houses were surveyed. Out of 1500 survey, it was assumed that the one respondents counts as one household member.

4. THE RESULTS

4.1 RISK PRIORITIZATION

There is a remarkable change in relative priority of risk perception due to different hazards. While in 1998, no such preference was seen, the 2009 survey indicated higher concerns for earthquake hazard.

In 1998, earthquake threat was perceived similar to the problem of air pollution, unsanitary water and motorcycle accident. In 2009, however almost 45 % of the population considered earthquake risk to be of major concern. Interestingly street crime was considered to be of greatest concern by slightly less percentage of the survey respondent indicating towards peoples' concern on the lack of law and order in the fluid political condition of the country.

4.2 Understanding of Earthquake Risk and Causative Factors

The Chart 1 shows a remarkable progress in understanding the earthquake risk and causative factors. To the question "whom do you blame if earthquake collapses your building" in 2009 only 4 % were showed lack of knowledge where as in 1998, almost 60% would blame no one for the same. In 2009, 30 % considered government to be blamed, and 22% considered it was their responsibility to ensure safety and once houses in the way risk is understood by the majority of the population.

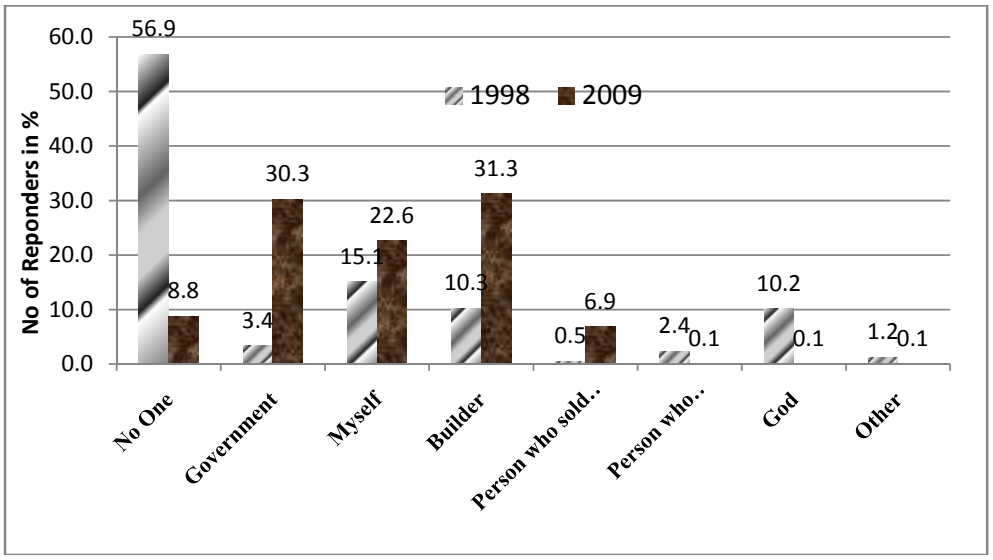

Chart 1: Comparative analysis whom would you blame if earthquake collapse your building

There are many pressing needs in many problems faced by a household in urban Kathmandu. Nevertheless, only slightly less than half of the surveyed population considers earthquake to be something to be worried about amidst many urgent problems as a significantly greater proportion of respondents in 2009, as compared to those in 1998, considers "Definite – Very much" the likelihood of a devastating earthquake occurring during their life time (Chart3).

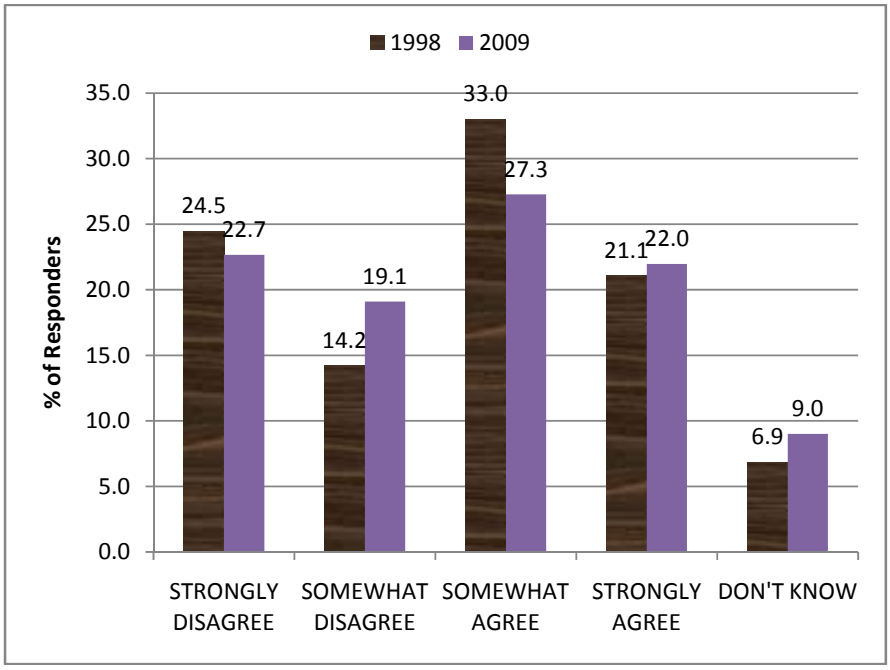

Chart 2: Comparative analysis on "I have more urgent problems to worry about than the possible occurrence of an earthquake

4.3 Thinking about Earthquake Risk

Kathmandu Valley people are now thinking more often about earthquake risk as compared to what they did in 1998 (Chart 3)

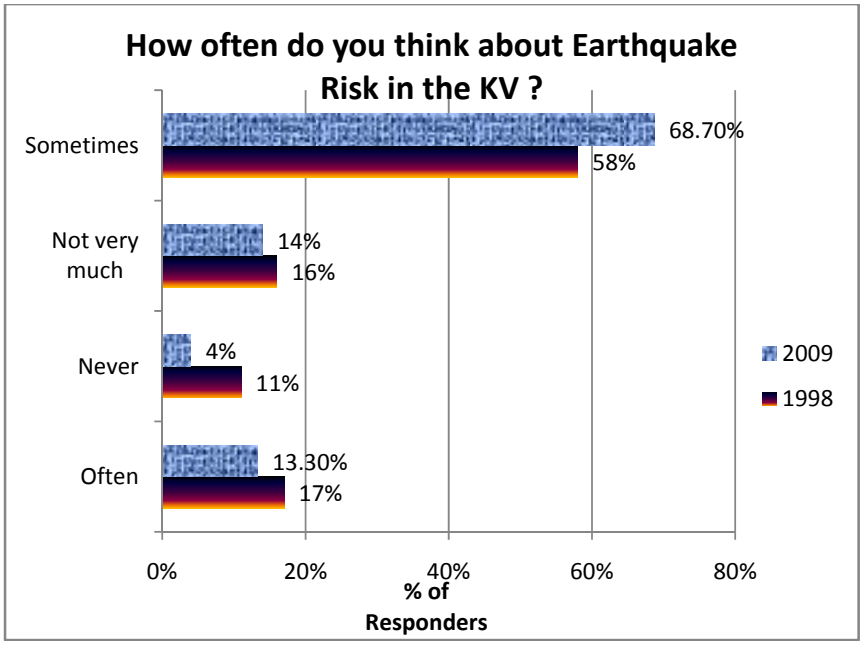

Chart 3: Comparative analysis on How often do you think about Earthquake Risk in the KV

4.4 Responsibility of Earthquake Risk Reduction

The questions "whom would you blame if earthquake collapse your building, office/workspace received much more coherent and rational response in 2009 as compared to the response in 1999.

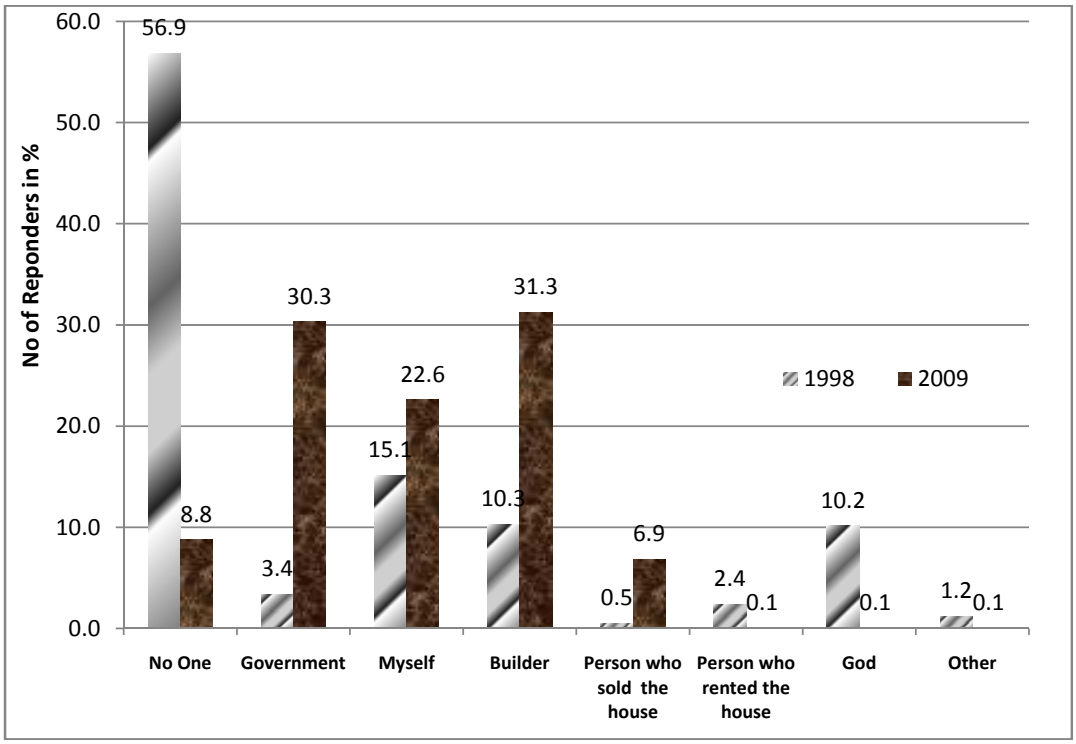

Chart 4: Comparative analysis about "whom would you blame if an earthquake collapses your building"

While about 57% of respondent did not know where to blame in 1998, only about 4 % respondent said "no one is responsible in 2009, and they shifted responsibility to the government (from 3.4% in 1998 to 30 % in 2009), myself (from 15 % to 33 %), builder (from 10 % to 3 %). Something similar is seen in case of the change in the perception of responsibility in case of earthquake collapse of office or workspace although there is a significant change in the positive direction.

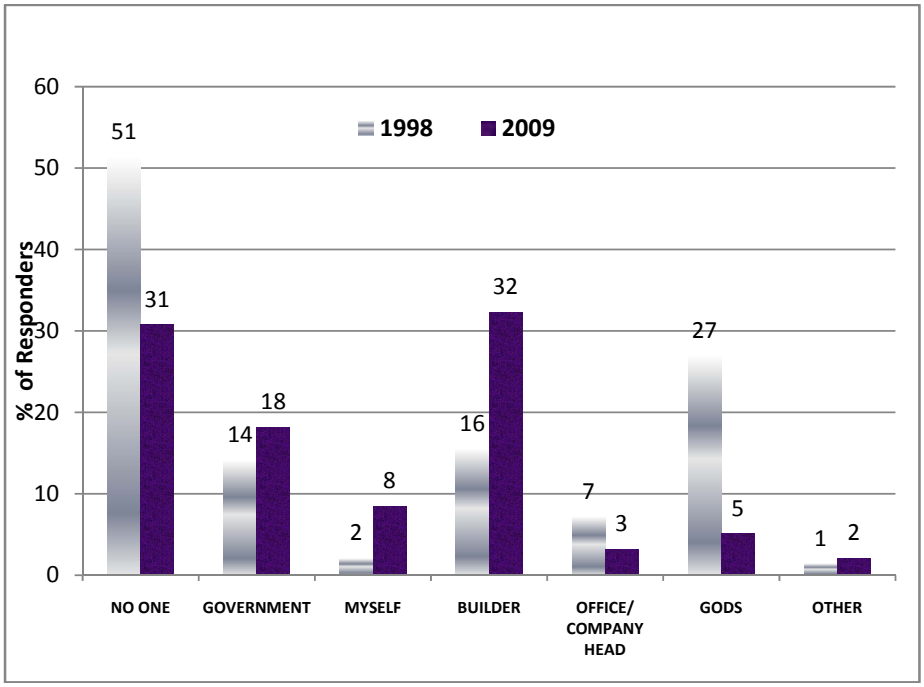

Chart 5 : Comparative analysis about whom would you blame if an earthquake collapse your office/ workplace buildings

4.5 Concern on Safety of Children and School

There is a growing demand on the government and, mainly, the school management committee for ensuring safety of schools which the child of the respondents attends. (Chart 6) Due to enhanced awareness the proportion of fatalists who see "god's hand" in earthquake disasters has reduced to half of the level 1998.

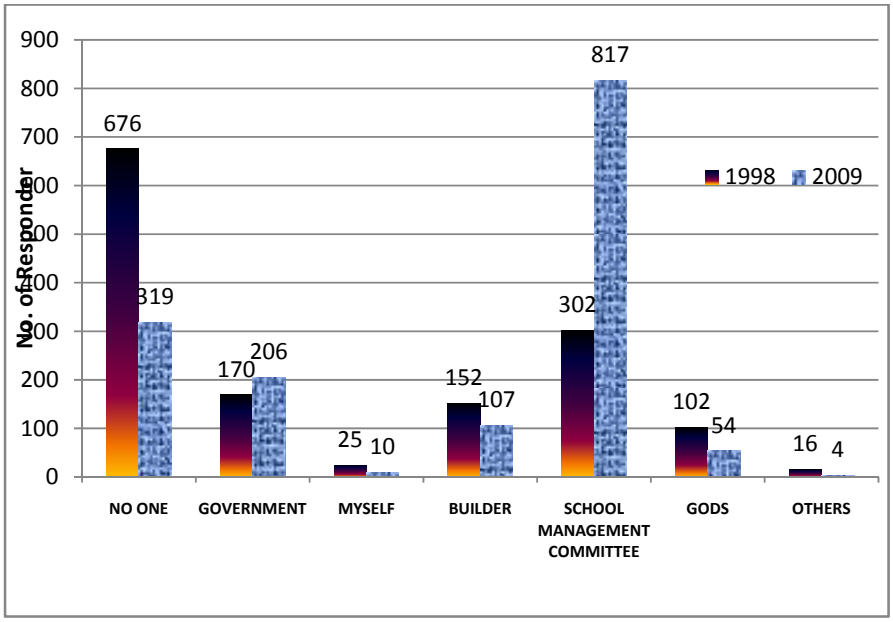

Chart 6 : Comparative analysis on If your child's school collapsed in an earthquake, whom would you blame

As per the figure the level of awareness has been increased around 10 % within 10 years. Which suggested that there should have more efforts to enhance the public awareness and capacity development for potential earthquake risk of the valley.

A majority of responders suggested that they would like to include earthquake preparedness in the school curricula in both survey. .

5. CONCLUSIONS

The finding of this survey has helped to identify areas of risk reduction and preparedness with the largest public support in the valley. In order for any earthquake mitigation plan to succeed, it must be based on the needs and desires of the public.

The relative risk perception results have been used by NSET and other agencies in developing their strategies utilizing enhanced concern of earthquake risk with respect to other risks. However, planners are yet to take into account the level of concern expressed by the respondents for each of these risks when prioritizing allocation of time and funds for city projects.

As per the study, out of 1500 responders 88 % of respondents described themselves somewhat informed of the earthquake risk in the valley and 12 % of reported not feeling well informed. The majorities of the responders stated that they would stay in safe place inside the house rather than run outside during earthquake. Only 4 % of responders reported don't know. This suggested that people are getting aware about earthquake risk in the valley but still need to scale up awareness program especially in core city area of the valley

Though majority of responder's source of information is listen to radio and FM then television, read the difference magazines, results indicates that the radios and FM/television has been the most common source of information about the earthquake risk in the valley. In future awareness activities they should take advantage of the larger radio and television audiences.

Additionally, since an overwhelming number of respondents thought that earthquake preparedness should be included in the schools' curriculum and a bulk of responders blame school management committee if earthquake collapsed their child's schools. Only a small number of respondents had learned about the earthquake risk in schools, which reveals there is a tremendous need to enhance disaster awareness even among school teachers, educators and general public. No doubt, a number of school-based earthquake safety awareness programs have been started by many agencies in recent times, still the efforts need to be scaled up significantly.

The difference in response between men and women to the question of feeling well informed of the earthquake risk suggests that future awareness campaigns should ensure reaching to females with the same success as males. The questions about sources and times of earthquake risk information are especially important in this regard.

In view of the weak socio-economic condition, political instability and geological condition there is a need to be focused on sustainable structural and non-structural mitigation measures, which can also help raise the overall awareness level of local communities towards earthquake risk reduction.

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