II-3 Social Structural Survey

SOCIAL STRUCTURE SURVEY REPORT

JULY, 2001

JICA Study Team

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ACRONYMS

BKP	-	Bhaktapur Municipality
DMC	-	Disaster Management Committee
JBR	-	Junga Bahadur Rana
KIS	-	Key Informants Survey
KMC	-	Kathmandu Metropolitan City
NGO	-	Non Governmental Organization
NSET	-	National Society for Earthquake Technology
NWSC	-	Nepal Water Supply Corporation
RCC	-	Reinforced Cement Concrete
RPS	-	Risk Perception Scale
SPSS	-	Statistical Package for Social Science
SSS	-	Social Structure Survey
VDC	-	Village Development Committee

EXECUTIVE SUMMARY

This study aimed at clarifying, identifying and characterizing the potentials of earthquake related disaster mitigation in the three districts of Kathmandu Valley i.e.; Kathmandu, Bhaktapur and Lalitpur. Based on some specific characteristics such as the land use, population density, historical development setting, water sources, availability of open space for evacuation, nature of road and the building type, these districts were divided into several clusters and altogether a total of 119 sample households were drawn for primary data collection. This was also supplemented by review of related documents, focus group meetings and interviews with key informants.

Data revealed that mostly people lived in joint families and they had relatively larger family size. They were educated and had income higher than the national average. Dug wells and roar pumps were still important for acquiring water for various purposes indicating that water supply from NWSC was neither regular not equitably distributed. Most of the households spent more on food & education and almost negligible on medical purpose. Most of the residents lived since generations and they had sentimental attachment with the land. They were religious minded, visited temples and were willing to help the victim in the time of disaster. They were not conservative, as they were willing to share common shelter & food in case of evacuation. Cracked buildings & open & high-tension electric wire passing by their house were perceived as most hazardous objects.

Communities were organized into groups. *Guthi* was an important institution among the Newars to maintain group cohesion and continuity of tradition. For new settlers and younger households, various clubs, association and similar other informal organizations were more important.

A scale, which measured the level of risk perception known as risk perception scale (RPS) was developed and all households were ranked accordingly. Most of the households scored high in the RPS. In the traditional and city core areas people were more perceptive on risk compared to other clusters. Risk perception was related to age & education. Willingness to ensure house was found related to risk perception.

SOCIAL STRUCTURE SURVEY

I. INTRODUCTION

1.1 Background

Nepal's unfavorable natural conditions such as fragile geology & steep topography make her as one of the most disaster - prone countries in the globe. Natural disaster like floods, landslides, epidemics, fire & earthquakes have continuously affected the country in the past resulting to the loss of human life, infrastructures, crops, livestock & the likes. The present study mainly focuses on earthquake related disaster. Documents reveal that the great earthquake of 1934 AD (8.4 Richter scale) claimed the lives of 16,875 people destroying 318,139 houses. This comes to about 20% of the houses completely destroyed and 40% of the Valley's building stock severely damaged. In Kathmandu itself, one quarter of all the homes was destroyed. Documents reveal that, there occurred three earthquakes of similar magnitude in Kathmandu Valley in the 19th century: 1810, 1833, and 1866. In the year 1982, a 6.2 Richter scale of earthquake hit the Far Western Region of Nepal destroying in the lives and property of the people. The 1988 earthquake (6.4 Richter scale) in the Eastern Development Regions killed 721 people, and damaged 150,099 houses.

Kathmandu valley in the past few decades has grown rapidly in an unplanned way. Since the return period of a large-scale earthquake is about 75 years in this region, it is foreseeable that the next large-scale earthquake might be due anytime. Once such a large- scale earthquake occurs, Kathmandu may suffer to an extent that might make it dysfunctional to act as a capital city of attraction and growth & development might greatly be hampered all over Nepal. Hence, disaster prone situation of Kathmandu valley warrants an urgent attention.

1.2 Objective and Scope

The main objective of the Social Structure Survey is to clarify, identify and characterize the potential of disaster mitigation in Kathmandu valley in order to fulfil basic information for preparing a comprehensive disaster mitigation plan. However, following were the specific objectives:

1. To understand the socio-economic characteristics of the residents of Kathmandu valley,
2. To assess risk perception and preparedness among the residents, and
3. To explore mitigation possibilities.

Scope

The study covers all the three districts of Kathmandu valley i.e. Kathmandu, Bhaktapur & Lalitpur. More specifically, it included city core areas of five municipalities i.e.; Kathmandu Metropolis, Kirtipur, Bhaktapur, Thimi and Lalitpur Municipalities, traditional settlement areas of Tokha & Khokna, together with some of the new development areas and commercial, semi-commercial & industry areas.

II. APPROACH AND METHODOLOGY

2.1 Survey Design & Sample Size

This study attempts to understand the socio-economic profile of the Kathmandu residents, find out their risk perception regarding earthquake and also come up with potentials of mitigation.

Risk perception data are non -existent so are the details of mitigation potentials. This situation suggests an **exploratory (research) survey design** to follow for the study and hence this was adopted. Altogether there were 119 households who were sampled for interviewing. The settlements of the valley were divided into various types and due care was given to include sample from each of the categories/ clusters. The details follow.

2.2 Selection of the Area/ Clustering

In order to gather information specifically the perception about the effects of earthquakes and mitigation requirement of the people representing different communities on different localities of the Kathmandu valley, the samples were drawn from different such clusters. The city core areas of the five municipalities (KMC, Kirtipur, Thimi, Lalitpur and Bhaktapur) and traditional settlements like Tokha and Khokana represent the Newar community living in the compact settlement, the urban fabric of which dates back to the 17th century or even earlier. The population density of the city core areas is very high and varies from 400 person per hectare to 900 person per hectare. Narrow streets lined with continuous rows of brick, concrete and timber houses are the characteristics of the city core area. The houses abutting the main streets such as New road and Asan have mix uses, whereas the houses abutting narrow lanes and courtyards even in New road and Asan inner side areas have predominately been for residential use. In the mixed use zone, ground floors of almost all houses are used as shops and 1st and 2nd floors are used for shop, offices, and/or restaurants and the upper floors are used as residential apartments.

The traditional settlements like Tokha and Khokana Villages represent the Newar Community. People living in Tokha and Khokana are mainly engaged in farming and specialized trade work like oil pressing in Khokana and *Chaku* (cooked molasses) making in Tokha. In spite of variations in size, geographic location and economic activities of their inhabitants, the Newar settlements are not radically different from one another irrespective of whether they are called towns or villages.

Of distinctly different character are the habitations and settlements of the people living in urban fringes i.e.; new development areas. Recent suburban development in the third quarter of the 20th century has resulted in urban sprawl and unplanned suburban development. Except few scattered planned development areas (Land Pooling and site and services) most of the urban and suburban areas like Budhanagar, Kalimati, Putalisadak, Panga and urban area of Katunje (rural area) have been developed informally by individual house owners. In these areas, the public sector did not issue any guidelines for the development of infrastructure extension. Rather people developed lands along the existing major arterial roads mainly constructed for the inter- city traffic movements, which guide urban expansion. This phenomena encouraged ribbon development along the major roads. The inner land remained unattended by the roads. The introduction of the guided land development program and the further demand of land for housing in recent years have encouraged the inner land development in a scattered and unplanned manner. The population density of urban fringes is very low (68 person/ha) and the rural density is about 17 person/ha.

Apart from the unplanned haphazard development areas, there are planned settlements too. They are Kuleswore, Falphutar, Gangaboo, Dallu, Saibu, Bagmati Corridor, Lubu, Kamal Vinayak, Liwli, Sinchi Tar, Sinamangal, Chabahil and Nayabazar. These settlements were planned as site and services and land pooling project. This suburban development has provided housing for families moving into the Kathmandu valley from elsewhere in Nepal, but also represents a migration of the well –to-do from traditional city core areas. So the community living in suburban is heterogeneous and mainly represents the outsiders. The commerce sector, which comprises of the wholesale and retail trades,

appears to be growing robustly in the past few decades engaging almost 13 percent of economically active population during 1991. This was double compared to 1981 when it was 6 %. Commercial areas like New Road and Asan represent the areas predominantly used for mixed purposes (shops, offices, restaurant and residential mixed). In New Road almost all the offices and banks are rented to outsiders and upper floors are used by house owners themselves, where as in Asan, almost all shops in ground and first floor and other floors are used by house owners themselves.

The main streets of Kalimati and Putalisadak are characterized by commercial activities. These areas are being developed since the third quarter of the twentieth -century. The owners have rented out their premises in ground, first and second floor lands and owners themselves use the upper floors.

In Kathmandu Valley in 1991, the manufacturing sector engaged approximately 12 percent of economically active population, which shows more than six fold rise from the mere 1.9 percent share in 1981. Kathmandu district has by far the highest concentration of the manufacturing units. Out of the total 2142 manufacturing establishments located in the Valley during 1993, the Kathmandu district accounted for 64 percent of total manufacturing establishments, with Lalitpur and Bhaktapur having a share of 29 percent and 7 percent respectively. The manufacturing establishments cumulatively engaged approximately 1,23,000 persons. There are three industrial estates and located separately in all three districts, which encompasses a total area of nearly 55 ha. The Balaju industrial estate in Kathmandu district covers an area of 35.5 ha and 72 industries operating in this estate provides employment to almost half of the total employment opportunities created in these estates.

Survey Site

Classification		Region	Name of the Area	Sample Number	Location
City Core Area		KMC	New Road	6	1
		KMC	Asan	6	2
		Kirtipur		3	3
		Thimi		4	4
		Lalitpur		8	5
		Bakhtapur		11	6
New Development	Land Pooling	KMC	Budha Nagar	5	7
		KMC	Kuleswor	5	8
		VDC/KTM	Gongabu	5	9
	Informal	KMC	Putali Sudak	6	10
		KMC	Kalimati	6	11
		Kirtipur	Panga	2	12
		Bakhtapur		2	13
		Thimi		1	14
		Lalitpur		2	15
	Rural	VDC	Katunje	5	16
Traditional Settlement		VDC/KTM	Tokha	3	17
		VDC/LLT	Khokna	10	18
Commercial	Commercial	KMC	New Road	4	19
		KMC	Asan	4	20
	Semi Commercial	KMC	Kalimati	4	21
		KMC	Putali Sudak	4	22
Industry		KMC	Balaju	13	23
Total				119	

2.3 Scale Construction & Scaling

An attempt was made to construct a **"Risk Perception Scale" (RPS)** in order to rank the sampled households according to the scores they obtained.

In the questionnaire, in part B, there were 12 questions, which were directly related to risk perception and they were selected for scoring. They were from question 74-77, 79-83, 86-87 and 89. These questions were related to the possibility of occurrence of earthquake in Kathmandu valley i.e. whether or not the households perceived earthquake as inevitable disaster in Kathmandu valley, their familiarity with such incidents in the past, the relative degree of perceived danger due to various conditions related to disaster, immediate action that they would undertake to rescue in case of the incidence, and the degree of willingness to help for mitigation measure.

The more a household expressed his sensitivity towards perceiving earthquake as risk, the higher one would obtain the score. Each individual would thus receive a score for each response. The individual scores of all the 12 responses would add up to the total score for that individual.

Questions of Risk Perception

- Prioritization of Hazard
- Possibility of earthquake
- Knowledge about 1988 Earthquake
- Knowledge about 1934 Earthquake
- Frequency of Worry about Earthquake
- Had Experienced any Severe Earthquake
- Perception on Gujarat Earthquake
- How safe Kathmadu Houses if Gujarat scale Earthquake Occurred?
- If Earthquake experienced inside the Building
- Earthquake is God's Wish
- Read any Earthquake Documents
- Choose Earthquake Resistance School?

Risk Perception Scale (RPS) is a summative scale and it ranges from 4 to 38.

Once the individual households obtained scores the second step was to rank order the households into three categories as High, Moderate & Low. Those who obtained 15 or less were ranked as Low in the RPS. Those receiving 16-26 were ranked as Moderate. And those households obtaining 27 and above were ranked as High in the RPS. The household number 85 had incomplete answers with regards to these questions so that household was discarded from the analysis. This made the households equal to 118. These 118 households were ranked according to the total scores they obtained. The details of scoring procedure appear in the annex. III.

Level of Risk Perception

Category	Scores
High	27 and above
Moderate	16 to 26
Low	15 or less

2.4 Data Collection Techniques

Both primary & secondary information were collected during the study. The sampled households were the primary source of information. Personnel Interviews were conducted with 119 households. Focus Group Meeting was another technique of data collections. Altogether there were two focus group meetings conducted one each in Kathmandu & Bhaktapur. While personal interviews provided information at the individual/ household level, group meetings were helpful in getting opinion on community level information and mitigation possibilities.

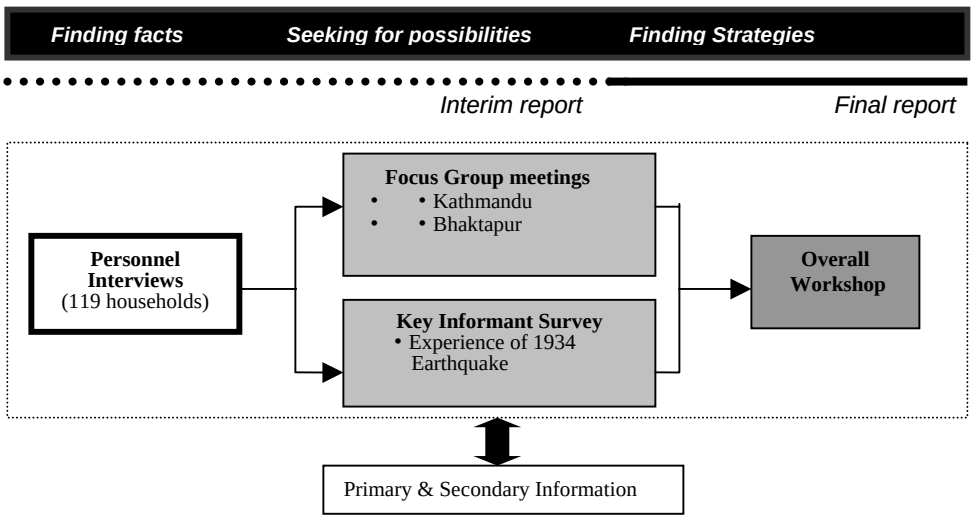
The third method/ technique of data collection was Key Informant Survey. Those individuals, who were old enough (80 years of age or more) and still remembered the great earthquake of 1934, two of such informants were selected for drawing information on their experience of that earthquake, the rescue measures that were taken and any suggestion or impression that could be helpful to plan future mitigation measures. Preliminary information were shared with different groups of people to get feed back before the final report was prepared.

2.5 Data Analysis

All raw data were entered in the computer following a Coding Manual. Frequency tables, and cross - tabulations were made to know if there existed any association between some selected variables. An attempt was also made to see if some variables were responsible to making individuals high, moderate or low in terms of risk perception. Computer Programs such as Excel & SPSS (Statistical Package for Social Science) were used to analyze the data. Data were also presented graphically wherever they were found relevant.

2.6 Limitations

The conclusions drawn from this study should be taken as indicative because of its small sample size. This also had an implication on the cluster-wise comparisons.



III. SOCIO-ECONOMIC PROFILE OF KATHMANDU RESIDENTS

3.1 Household Profile

A look at our data reveals that three- fourths of our sampled households were male, most of the families (four-fifths) were within the age bracket of 15-60 years and the majority of the households (83%) were literate. Interestingly, the proportion of small, medium, and large families were almost the same. Nearly two-thirds of all the households lived in joint and/or joint extended families. A joint family meant married sons living together with the parents and joint extended family meant the parents and their brothers too sharing the same roof and kitchen. Little more that one-third of all the families were nuclear families. Nuclear families were those where parents & unmarried children lived together.

Majority of the households (63%) were medium to large in size. This figure was consistent with the structure of the family where there were more extended/ joint families compared to the nuclear ones (Table 1).

Table 1 : Household Profile

Characteristics	Household	
	Number	**Percentage**
1. Sex		
Male	90	75.6
Female	29	24.4
Total	**119**	**100**
2. Age		
15-59 years	96	80.7
60 years and Above	23	19.3
Total	**119**	**100**
3. Literacy		
Illiterate	20	16.8
Primary	23	19.3
Lower Secondary	12	10.1
Higher Secondary	31	26.1
B.A.	27	22.7
MA/Ph.D.	6	5.0
Total	**119**	**100**
4. Caste/Ethnic Group		
Newar	95	79.8
Brahmin	8	6.7
Gurung/Magar	1	0.8
Chhetri	11	9.2
Terai Origin	1	0.8
Rai/Limbu	2	1.7
Others	1	0.8
Total	**119**	**100**

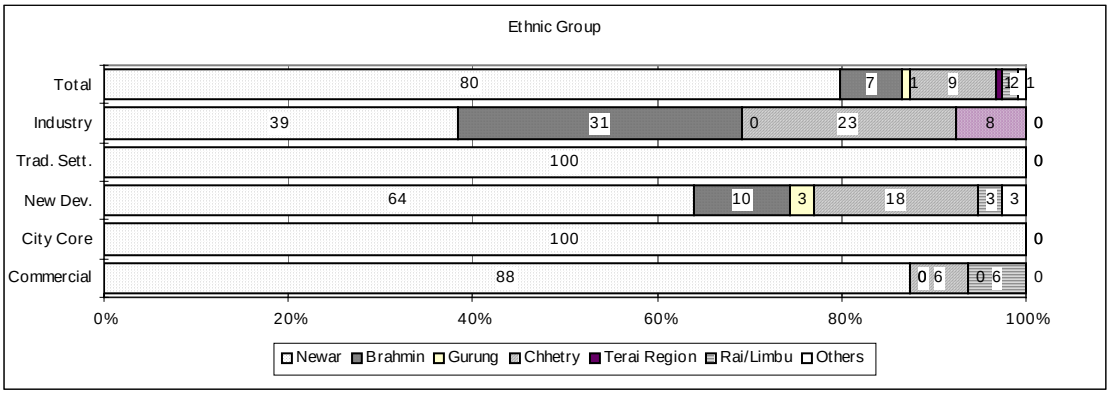
Characteristics	Household	
	Number	Percentage
5. Family Size		
Less than 5	44	37.0
5 – 7	36	30.3
More than 7	39	32.8
Total	**119**	**100**
6. Family Structure		
Nuclear	45	37.8
Joint	65	54.6
Joint Extended	9	7.6
Total	**119**	**100**

Ethnic Group by Cluster

Newars were in overwhelming majority in all the clusters except in the industry cluster. In the city core and traditional clusters all households were Newars but in the industry cluster, besides Newars, there were also Brahmin, Chhetri and Tarai origin households.

Table 2 : Clusterwise Ethnic Groups in Percentage

Ethnic Group by Cluster	Commercial + Semi Commercial	City Core	New Development	Traditional settlement	Industry	Total
Newar	88	100	64	100	39	80
Brahmin	0	0	10	0	31	7
Gurung	0	0	3	0	0	1
Chhetry	6	0	18	0	23	9
Terai Region	0	0	0	0	8	1
Rai/Limbu	6	0	3	0	0	2
Others	0	0	3	0	0	1
Total	100	100	100	100	100	100.0



3.2 Employment, Income, Consumption and Expenditure Patterns

Majority of the households (59%) were self employed meaning that they had their own business such as shop owners, hawker, traders or the owner of companies followed by those who were employed by some others (30%). Of those who were employed nearly nine-tenths were employed by public sector

or government (Table 3, 4). It was interesting to note that in four-fifths of the families there were 1-4 family members who earned money & shared in the family (Table 5).

Table 3 : Households Classified According to Employment

Employment	Number	Percentage
Employment	36	30.3
Self-Employed	70	58.8
Both	12	10.1
Missing	1	0.8
Total	**119**	**100**

Table 4 : Households Classified According to Occupation

Occupation	Number	Percentage
Public Sector Job Govt. Job	32	24.4
Agri. & Forestry	12	9.2
Manufacturer	4	3.1
Construction	3	2.3
Services	39	29.8
Shop	24	18.3
Trade	9	6.9
Others	8	6.1
Total	**131**	**100**

Table 5 : Number of Family Members who have income generating Jobs

Size	Number	Percentage
One	46	38.7
2-4	47	39.5
5 & More	8	6.7
Missing	18	15.1
Total	**119**	**100**

Most of the households had their residence very close (400 m) to their work place. Similarly, to most of them it was a matter of less than 5 minutes and most of them walked to their office (Table 6).

Table 6 : Distance & Time taken to reach the Work Place

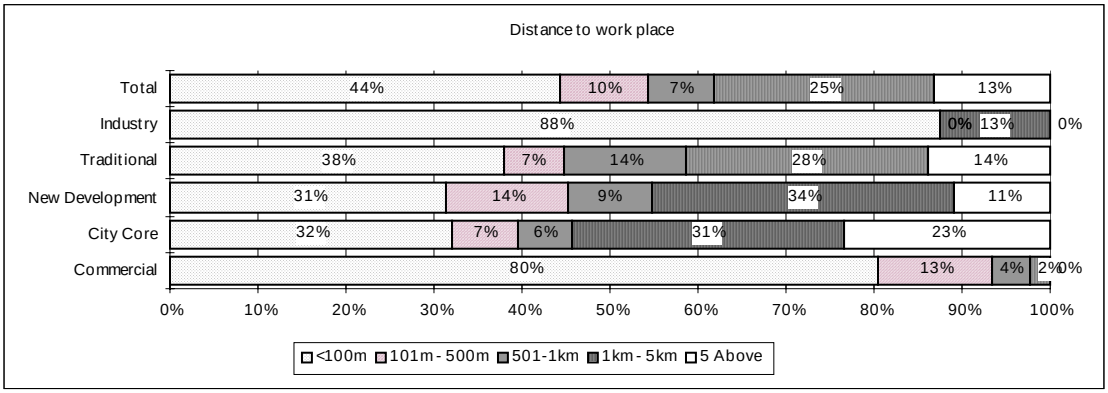
Distance, Time & Mode of Transportation					
Distance	**No.**	**Time (m)**	**No.**	**Mode**	**No.**
<100m	101	< 5m	129	Walking	160
101m – 500m	23	5m – 15m	55	Bus	33
501 – 1km	17	15m – 30m	40	Trolley Bus	4
1km – 5km	57	30m – 60m	10	Private Car	1
5km and Above	30	>60m	3	Taxi	1
				Company Bus	4
				Motor Bike	25

Distance to Work Place

Interestingly, most of the households in the commercial/ semi-commercial and industry clusters and one-third of households in the city, new development and traditional clusters were very close to their work places i.e.; within a walking distance of less than 100 meters. Other one-third of the households in city core, new development, and traditional clusters had to travel 1-5 Kilometers to reach their work place. (Table 7)

Table 7 : Clusterwise Distance to Work Place

	Commercial	City Core	New Development	Traditional	Industry	Total
<100m	80%	32%	31%	38%	88%	44%
101m - 500m	13%	7%	14%	7%	0%	10%
501-1km	4%	6%	9%	14%	0%	7%
1km - 5km	2%	31%	34%	28%	13%	25%
5 Above	0%	23%	11%	14%	0%	13%
Total	100%	100%	100%	100%	100%	100%



Expenditure also depended on the income level. Data reveals that, nearly forty percent of the households spent 8 – 14 thousand rupees per month. Few families (15%) spent more than Rs. 18,000 per month (Table 8).

Table 8 : Family by Monthly Expenditure

Expenditure	Number	Percentage
Less than 4,000	6	5.0
4,000 - 6,000	13	10.9
6,000 - 8,000	9	7.6
8,000 - 10,000	19	16.0
10,000 - 12,000	16	13.4
12,000 - 14,000	12	10.1
14,000 - 16,000	8	6.7
16,000 - 18,000	8	6.7
More than 18,000	18	15.1
Missing	10	8.4
Total	**119**	**100**

But families earning more than Rs. 18,000/ month were 27.7% which was the maximum number of family among all the categories (Table 9).

Table 9 : Family by Monthly Income

Income	Number	Percentage
Less than 4,000	5	4.2
4,000 - 6,000	9	7.6
6,000 - 8,000	7	5.9
8,000 - 10,000	11	9.2
10,000 - 12,000	15	12.6
12,000 - 14,000	11	9.2
14,000 - 16,000	8	6.7
16,000 - 18,000	6	5.0
More than 18,000	33	27.7
Missing	14	11.8
Total	**119**	**100**

Most of their income was used in procuring food or on education. Calculation revealed that altogether 119 families spent a total of Rs. 12,85,035 in a month and nearly two-thirds (65%) of it was spent for food and education (Table 10). It was interesting to note that expenditure on medicine was lowest i.e. 2% of the total. It is not because the valley residents were healthy who did not require any medicine. The lower expenditure for health may be due to lack of proper health education.

The Social Development Report of Nepal, 1998 reveals per capita income of Nepal as Rs. 7,673 whereas, the per capita income of Kathmandu, Bhaktapur, and Lalitpur are respectively Rs. 20939, Rs. 9922, and Rs. 17689. Though per capita income of Nepal is Rs. 7,673 but for Kathmandu valley it is Rs. 20,939. Survey results show highest number of households (28%) in the monthly income bracket of more than Rs. 18,000. This result is not consistent with the national figure. As income information is still a sensitive issue in Nepal among the Nepalese, survey result may be used with caution.

Table 10 : Average Monthly Expenditure by Food Item

Income	Total Expenditure	Average Expenditure Percentage
Food	506,330	39.4
Clothes	68,715	5.4
House Rent	10,200	0.8
Education	330,325	25.7
Recreation	54,600	4.3
Telephone	66,220	5.2
Electricity	99,190	7.7
Water	20,280	1.6
Gas	52,084	4.1
Medicine	49,890	3.9
Others	27,205	2.1
Total	**1,285,039**	**100**

Families were asked what sources of water were available to them for multiple use. An attempt was also made to see the type of ownership on such sources.

Data revealed that most of the public standpipes were public property whereas, most of the tube-well/ rower pumps were owned individually. Public standpipe and tube- well/ rower pump were the most frequently used sources of water which were simultaneously used for cooking/ drinking, washing & bathing. However, rower pumps were more used for washing & bathing compared to drinking.

Most of the frequently used sources i.e., public standpipe and the tube-well/ rower pipe were within a walking distance i.e. within a distance of 10 meters. As dug well could be useful in case of fire disaster (it itself could provide water and also could act as a temporary reservoir), there were 17 dug wells mentioned, most of which were within 10 meters periphery from the residence.

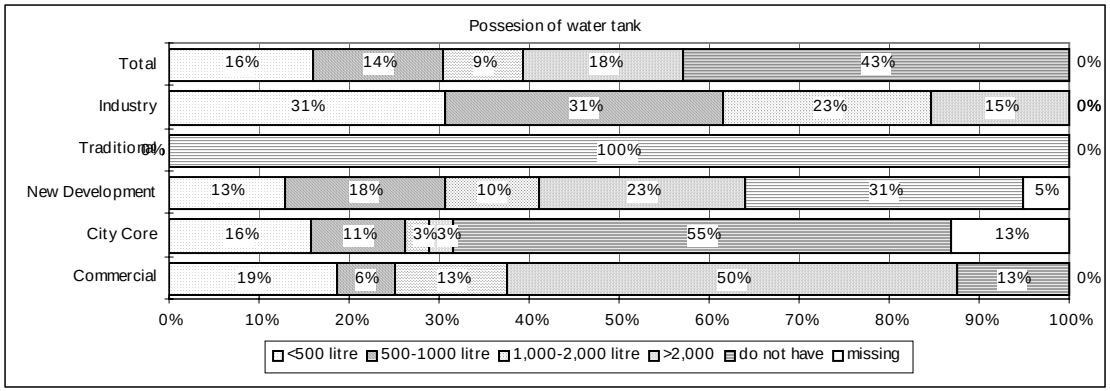
When households were asked if they had water supply from the Nepal Water Supply Corporation (NWSC), majority of them (76%) said they did & 6 percent mentioned that water was not available to them from the NWSC. Data reveals that number of households in the clusters of new development area & the city core who received water from the NWSC were more compared to other clusters. Again, residents of the same clusters relatively obtained water either daily or on every alternate days. It is obvious that those who were in the city core, might have linkage with the NWSC authorities & residents of new development area cluster could also be influential in getting water more regularly.

Households were also asked about the multiple use of water to know which source was important for what purpose. Dug well for the city core, tube well for the new development area and river for the traditional settlement were the sources more frequently used for washing; same pattern was true for bathing also, i.e., dug well, tube-well & river were most frequently mentioned for bathing.

An attempt was made to know if the households had reservoirs (Water Tank) to collect water. Fifty seven percent of the residents had water tanks of one type or the other. It was interesting to note that nearly two- thirds (64%) of the city core residents mentioned they did not have any water tank compared to little more than one-third (36%) who said they had. It is consistent with the earlier table, which shows that in the city core, the residents had more regular water supply from the NWSC compared to other clusters. In the New Development Area, those who had water tanks were double than those who did not have. Similarly, almost all (14 out of 16) in the commercial/ semi-commercial area mentioned that they had water tanks. In the commercial/ semi-commercial area and the New Development Area there were more water tanks of capacity with more than 2000 liters. City core had more tanks with smaller capacity mostly with <500 liters & few with 1,000 liters. More than half of the households (55%) in the city core did not have any water tank. (Table 11). Most of the household (66%) consumed water less than 500 litres a day (See Annex I - Tables 1 - 10).

Table 11 : Possession of Water Tank

	Commercial	City Core	New Development	Traditional	Industry	Total	Commercial	City Core	New Development	Traditional	Industry	Total
<500 litre	19%	16%	13%	0%	31%	16%	3	6	5	0	4	18
500-1000 litre	6%	11%	18%	0%	31%	14%	1	4	7	0	4	16
1,000-2,000 litre	13%	3%	10%	0%	23%	9%	2	1	4	0	3	10
>2,000	50%	3%	23%	0%	15%	18%	8	1	9	0	2	20
Do not have	13%	55%	31%	100%	0%	43%	2	21	12	13	0	48
Missing	0%	13%	5%	0%	0%	0%		5	2			
Total	100%	100%	100%	100%	100%	100%	16	38	39	13	13	112



Residents were also asked what sources of energy they used for cooking. Most of the households used kerosene, the second most used energy was electricity. In the traditional settlement, 62% of the residents mentioned they used firewood for cooking (Table 12).

Table 12 : Source of Energy by Clusters

Clusters	Source				
	Firewood	**Electricity**	**Kerosene**	**Gas**	**Others**
Commercial + Semi Commercial		11	13	4	
City Core	10	23	21	5	3
New Development Area	5	21	30		
Traditional Settlement	13	7	1		
Industry		3	11	1	

Sixty one percent of the residents said they did not know about any fire incidents in the neighborhood & the rest said they knew. But in the industry cluster all said they did not know (Table 13).

Table 13 : Knowledge/Incidence about accident due to fire

Clusters	Fire Accident		
	Yes	**No**	**Missing**
Commercial + Semi Commercial	7	9	
City Core	19	18	1
New Development Area	6	30	3
Traditional Settlement	12	1	
Industry		12	1

Livestock is a part of the farming system but animals & birds have also been used for religious purpose. There were 46 families who had livestock or pet animals. Most of them had pets (75%) (Table 14, 15).

Table 14 : Households having Livestock

Livestock	Household	
	No	**Percentage**
Yes	46	38.7
No	70	58.8
Missing	3	2.5
Total	**119**	100

Table 15 : Households Classified According to Types of Animals

Livestock	Household	
	No	**Percentage**
Large Animals (cattle, horse, buffalo)	2	3.6
Small Animals (goat, pigs, pets, dogs etc.)	42	75.0
Birds (poultry)	12	21.4
Total	**56**	**100**

3.3 Community Organization, Religion and Culture

In the study area very few mentioned they were there for more than 4 generation (8%). Majority of the residents (93%) were since less than 3 generations (Table 16).

Table 16 : Length of Stay

Length of Stay	Household	
	No	**Percentage**
First Generation	38	31.9
Second Generation	31	26.1
Third Generation	41	34.5
Fourth and Above	9	7.5
Total	**119**	**100**

Duration of Living

Majority of the households in the commercial/semi-commercial cluster (50%), city core (58%) and traditional (61%) cluster were relatively old timers who were there for more than 60 years, whereas in the majority of the households (69%- 77%) in the new development and industry clusters, the residents were relatively new (living from less than 30 years) (Table 17).

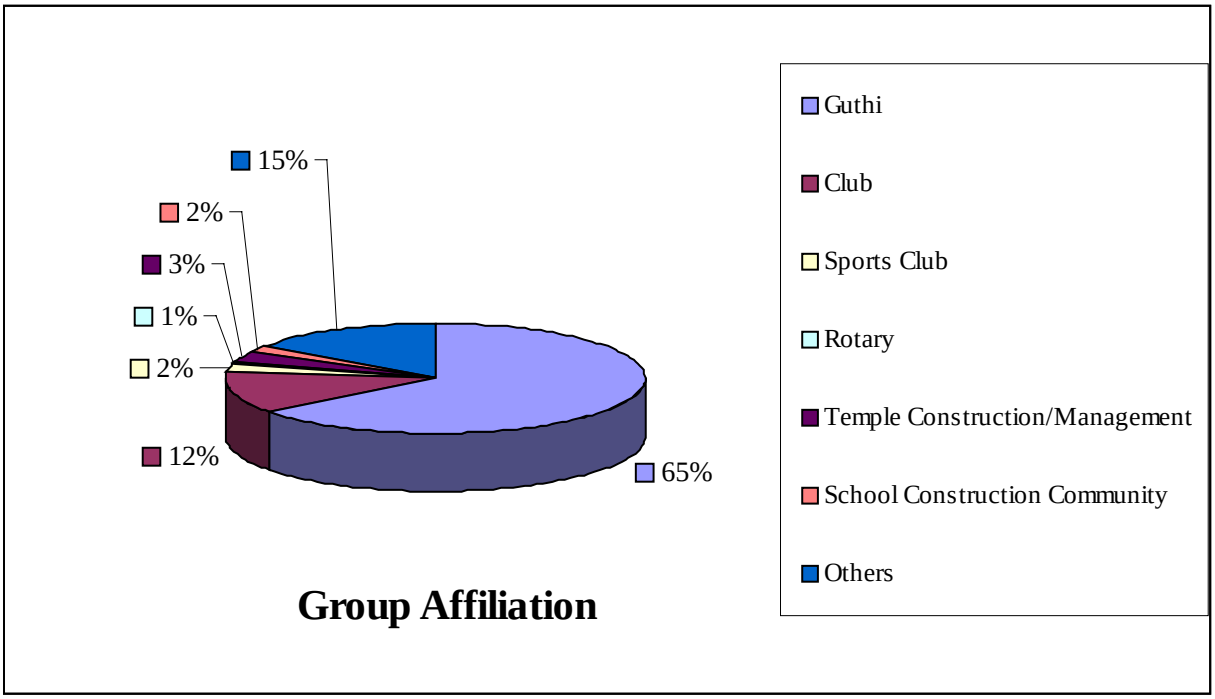
Table 17 : Duration of Living by Clusters

	Commercial	City Core	New Development	Traditional	Industry	Total
Less than 10 years	19%	11%	45%	8%	46%	26%
11-30 years	0%	5%	24%	0%	31%	13%
21-30 years	19%	0%	8%	0%	15%	7%
31 - 60 years	13%	26%	8%	8%	8%	14%
61 - 100 years	6%	47%	3%	15%	0%	19%
101 and Above	44%	11%	13%	46%	0%	19%
Missing	0%	0%	0%	23%	0%	3%
Total	100%	100%	100%	100%	100%	100%

Most of the households mentioned (75%) that they were affiliated with one or more groups. Only little less than one fifth (19.3%) were not affiliated with any such groups (see Annex I - Table 12). The majority (65%) of them were affiliated with *Guthi*. Mostly Newars had *Guthi* as one of the very important social organization (Table 18).

Table 18 : Nature of Affiliated Group

Groups	Household	
	No	Percentage
Guthi	80	64.5
Club	15	12.1
Sports Club	3	2.4
Rotary	1	0.8
Temple Construction/Management	4	3.2
School Construction Community	2	1.6
Others	19	15.3
Total	**124**	**100**

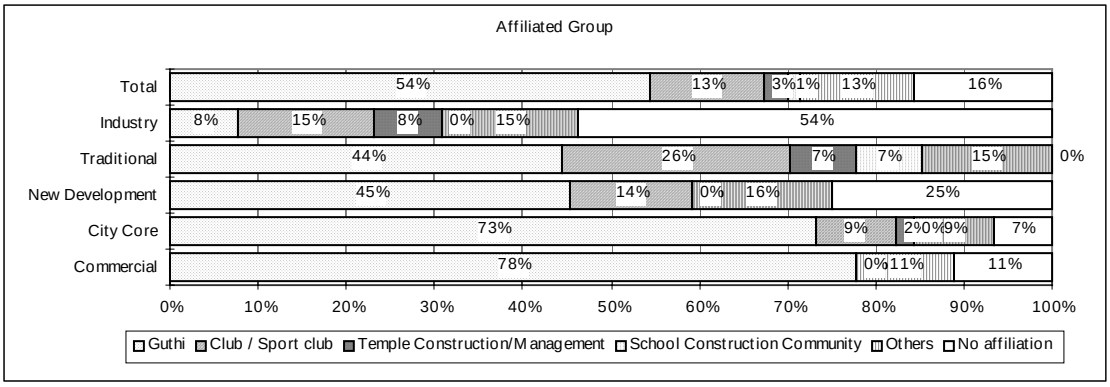


Cluster-wise Group Affiliation

Most of the households were affiliated with *Guthi* and some households mentioned they were also affiliated with local clubs. The percentage of households affiliated with *Guthi* was relatively higher in the commercial/ semi-commercial, city, new development, and traditional clusters. Majority of households (54%) in the industry clusters were however not affiliated with *Guthi*. It is obvious that this cluster had mostly (62%) non-Newar residents (Table 19).

Table 19 : Group Affiliation by Cluster

	Commercial	City Core	New Development	Traditional	Industry	Total
Guthi	78%	73%	45%	44%	8%	54%
Club / Sport club	0%	9%	14%	26%	15%	13%
Temple Construction/Management	0%	2%	0%	7%	8%	3%
School Construction Community	0%	0%	0%	7%	0%	1%
Others	11%	9%	16%	15%	15%	13%
No affiliation	11%	7%	25%	0%	54%	16%
Total	100%	100%	100%	100%	100%	100%



Most of the group members (66.3%) were also living in the neighborhood and majority of the residents (69%) said they could ask for help with their neighbors in case of disaster. In case of future disasters, neighbor were the first persons to seek for help to a vast majority (71%). It was very consistent with the reality because even if you had relatives, they might not be very close to your place, it were the neighbors who could be practically available to the next neighbor in such situation (see Annex I - Table 13 to 15).

More than half of the households said they would prefer their neighbor's house as shelter if their own houses collapsed & some others said relatives' houses (17.9%) and public facilities (14%) (Table 20).

Table 20 : Preferred Shelter in Case Own House Collapsed

Preferred Shelter	Household	
	No	**Percentage**
Neighbor's House	62	53.0
Friends House	9	7.7
Relatives House	21	17.9
Guthi Member's House	6	5.1
School Building	1	0.9
Temple	2	1.7
Temporary Shelter provided by the public sector	16	13.7
Total	**117**	**100**

Households were asked how frequently they met & on what occasions they met. Nearly half (45.6%) of them said they met once a year and they met mostly during festival time (35.7%) and funeral time (27.6%) (see Annex I - Table 16-17).

They were also asked about the unit of membership and size of the group. Family was the unit of membership in a *guthi* and majority of the households (84.9%) had a group size of less than 100. They were asked to mention if their group had own buildings & compound. Only little more than one-third (35.3%) said they had their own buildings whereas little less than half said they did not have such buildings & compounds (see Annex I - Tables 18-19).

Assuming that religious minded persons may be more willing to help in disasters, households were asked if they visited religious places such as the temples & the monasteries. Overwhelming majority (98.3%) said they did visit the religious places and most of them visited casually (44.5%) followed by daily visits (19.3%). For most of the residents, the religious places were in closer proximity (see Annex I - Tables 20-22).

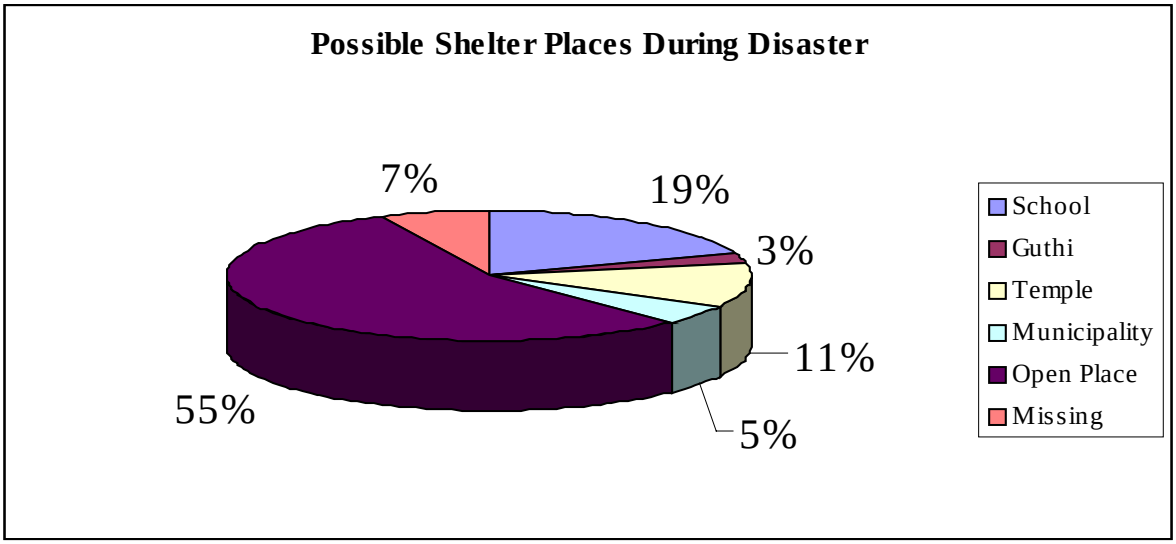
IV. RISK AND PREPAREDNESS

4.1 Space and Lifestyle

More than half (55.5%) of the residents said open places as the possible evacuation place & shelter at disaster times, followed by school (19.3%) (Table 21).

Table 21 : Possible Shelter Places During Disaster

Possible Facilities for Evacuation	Household	
	No	Percentage
School	23	19.3
Guthi	3	2.5
Temple	13	10.9
Municipality	6	5.0
Open Place	66	55.5
Missing	8	6.7
Total	**119**	**100**



Almost all had communication (97.5%) with their neighbors and majority of the residents (78.2%) communicated on daily basis. A vast majority (87.4%) said they had visited their neighbor's house and those who even knew or probably guess the layout i.e., their bedroom, kitchen etc. were nearly nine-tenths (88.6%) (see Annex Tables 23-26).

Most of the residents (94%) owned their house and old and new houses were almost equal in number. Nearly one-fourth of the houses was built only within 10 years of span and the same proportion of houses were built before 60 years.

About the type of houses, the majority had their houses in rows (56.3%) followed by independent of others (31%) and only one-tenth had courtyard type.

An attempt was made to find out what building materials, they had used to construct the ground floor of their houses. Most of the houses were reported to be built by brick in mud mortar followed by RCC. Ninety seven percent of them had not used any earthquake resistance device. When asked about the condition of their houses, nearly half (46.2%) of them said they were in excellent condition. Nearly

the same proportion thought the houses needed some to major repair and only 3.4 percent said their conditions were hazardous.

Very few houses (6.7%) were single storied & double of it had double storied buildings. Nearly fourth -fifths of the houses were three or more storied. Relatively highest proportion of houses (28.6%) were five or more storied.

Majority of the households (55.8%) lived in the 2nd and 3rd floor and mostly (60.7%) their bedrooms were also in the same floors. Only one- fifth of the households used ground floor for living & sleeping. Again the kitchen was in the third, fourth or fifth floors to majority of the households (64.4%). Even if they lived in different floors, it was obvious that most of them had common kitchen. They were asked if they had taken any loan to construct the house. Fourth-fifths of the households said they did not take any loan to construct the houses. They were also asked if they had even extended their house. Thirty-nine percent said they had extended their house and most of them had added the storey (76%). Not all had taken building permit from the municipalities (VDCs) to construct their houses. Nearly one-tenth (11 no.) did not know that they even required any permit. But there were 17 households who did not take any permit inspite of the fact that nearly nine-tenth of the households mentioned why the permit was necessary.

The households were also asked if they wanted to retrofit their buildings for earthquake resistance. The majority of them (77.3%) said they wanted to retrofit and most of them (90%) said they were willing to bear 25% of the total cost of retrofitting (see Annex I - Tables 27 - 44).

In order to know the communication media, they were asked which media they usually used to make contact with their family members from outside. Most of them contacted their family either by telephone (48.6%) or by personal visits (39.5%) (Table 22). There were multiple sources of information that were being used by the households and they were in most cases television, radio, national & local newspapers (Table 23).

Table 22 : Media used to contact Family Members

Media	Household	
	No	**Percentage**
Telephone	107	48.6
Telegraph	2	0.9
Internet	13	5.9
Mobile Phone	6	2.7
Fax	1	0.5
Visit	87	39.5
Others	4	1.8
Total	**220**	**100**

Table 23 : Source of Information for Daily Life

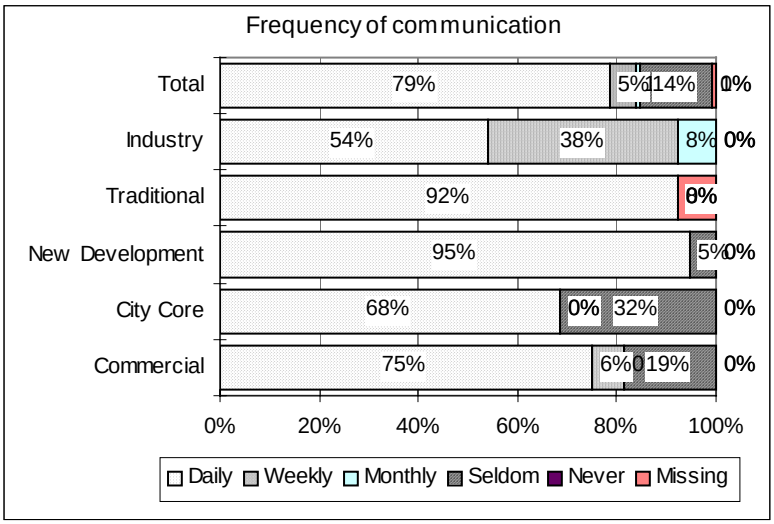
Media	Household	
	No	**Percentage**
Newspapers National	76	18.1
Newspaper Local	68	16.2
Television	108	25.7
Radio	107	25.5
Monthly Magazine	44	10.5
Internet	12	2.9
Others	5	1.2
Total	**420**	**100**

Frequency of Communication by Cluster

An attempt was also made to see how often the household made contacts with their friends & neighbors. Most of them said they communicated with each other daily (54%- 95%). (Table 24)

Table 24 : Frequency of Communication by Cluster

	Commercial	City Core	New Development	Traditional	Industry	Total
Daily	75.0%	68.4%	94.7%	92.3%	53.8%	79%
Seldom	18.8%	31.6%	5.3%	0.0%	0.0%	14%
Weekly	6.3%	0.0%	0.0%	0.0%	38.5%	5%
Monthly	0.0%	0.0%	0.0%	0.0%	7.7%	1%
Never	0.0%	0.0%	0.0%	0.0%	0.0%	0%
Missing	0.0%	0.0%	0.0%	7.7%	0.0%	1%
Total	100%	100%	100%	100%	100%	100%



4.2 Risk Perception and Mitigation

The preceding chapter attempted to describe the socio-economic profile of the Kathmandu valley residents & the physical/ institutional environment that they were living. Following section, describes their level of risk perception & willingness to participate in mitigation activities.

Households were requested to prioritize various earthquake hazards in the neighborhood. Some of the identified hazards were the cracked building, gas cylinder, narrow streets of the residential area, high tension electric wire passing beside or above the building, building walls next to each other, building constructed without any engineering supervision, courtyard style house & unsafe walls.

Cracked building was the most frequently mentioned hazard prioritized as number 1 by 53 households followed by high electric tension wire & building walls next to each other (prioritized as number 1 by 18 households). Courtyard style houses was prioritized as the least earthquake hazard as 20 households put it on the 8th ranking compared to only 4 households who mentioned this as of most important earthquake hazard (Table 25).

Table 25 : Perceived Earthquake Hazards

Hazard	Ranking								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Cracked Building	53	23	12	6	1	5	3	1	
Gas Cylinder Shop	5	14	8	15	9	5	7	10	11
Narrow Streets	13	22	18	18	11	11	3	2	
High Tension Electric Lines/Poles	18	18	27	12	3	3	2	1	
Building Walls Next to Each Other	18	13	8	10	26	15	5	1	
Buildings Constructed by Non-engineers	14	7	12	10	9	11	17	13	
Courtyard Style House	4	2	4	5	7	11	17	20	
Unsafe Walls	2	3	4	13	14	14	19	7	1
Others	1	1	1					6	14

When, asked if they saw any possibility of having a great earthquake in Kathmandu valley in their lifetime, half of them thought it might be possible. Only 11.8% said that it would definitely occur. However, 95% of the households saw it as a possibility to definite occurrence (Table 26).

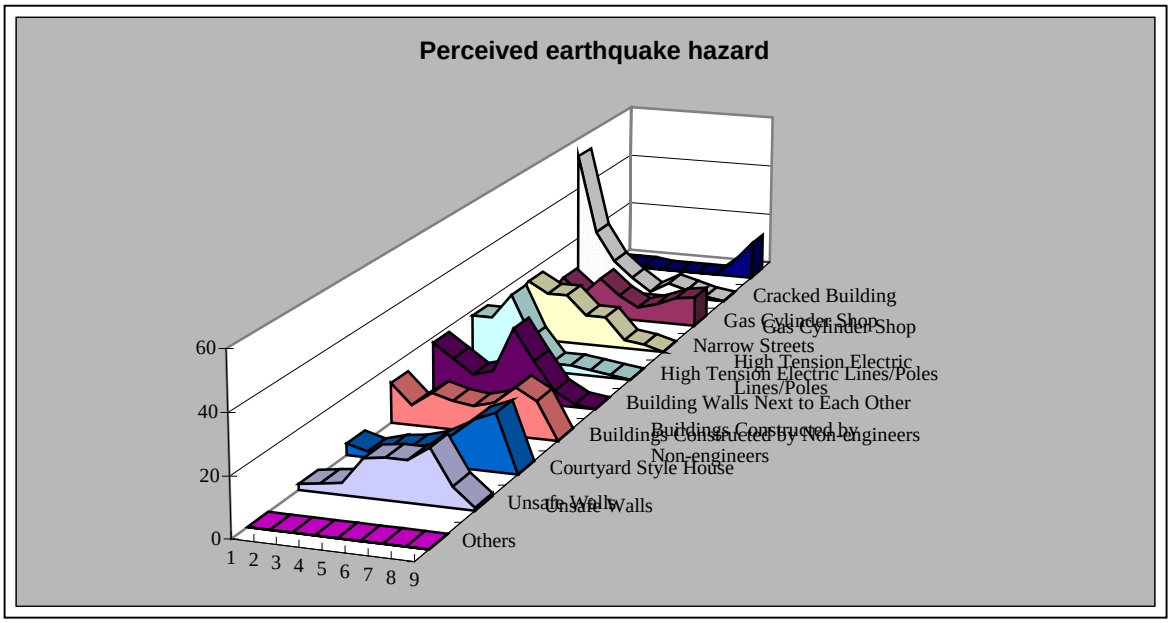
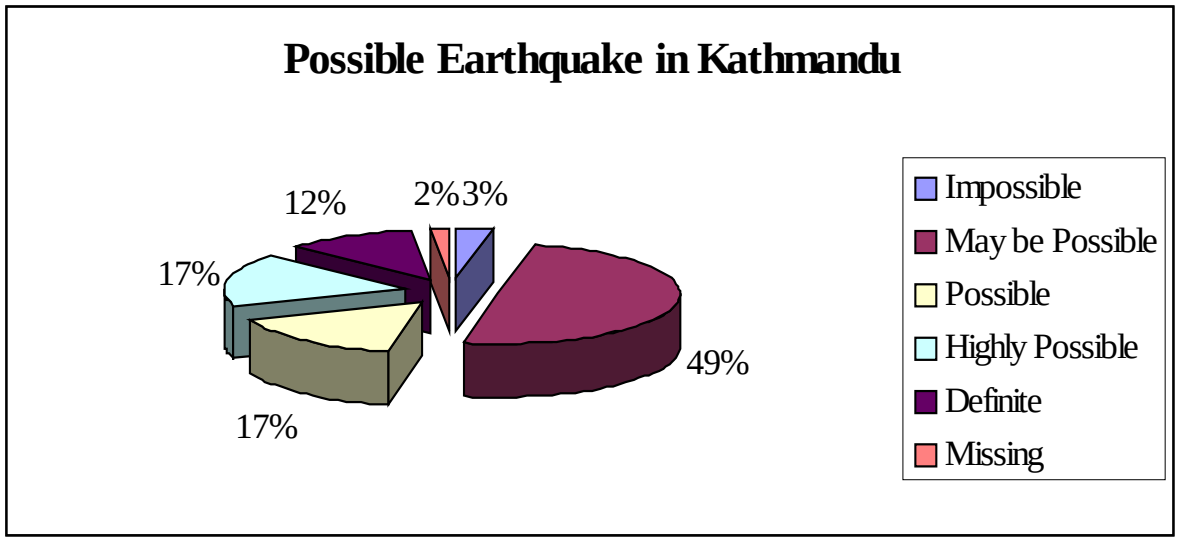


Table 26 : Will Kathmandu have an Earthquake during Your Life Time?

Possible Earthquake in Kathmandu	Household	
	No	**Percentage**
Impossible	4	3.4
May be Possible	59	49.6
Possible	20	16.8
Highly Possible	20	16.8
Definite	14	11.8
Missing	2	1.7
Total	**119**	**100**



Kathmandu had faced an earthquake shock in the year 1988 & so they were asked if they remembered & knew about at. Most of the households (90.8%) said they knew about it. When they were asked about the 1934 Great Earthquake 76.5% said they knew about it & they knew about it either from their grandparents (50%) or the father (27.9). Some knew from their mother too (8.1%) (see Annex I Tables 45-47).

Usually, such shocks do leave everlasting fear. So they were asked how often they were worried about such earthquakes. They were worried seldom to very often (79.8%) but 19.3% of the households mentioned that they never worried about it (see Annex I Table 48). When asked if they themselves had experienced any severe earthquake, the proportion of those who had experienced to those who had not was 6: 4 (Table 27).

Table 27 : Personal Experience of any Severe Earthquake

Experience	Household	
	No	**Percentage**
Yes	69	58.0
No	47	39.5
Missing	3	2.5
Total	**119**	**100**

On 26 January 2001, a severe earthquake hit the Gujarat State of India. The households were asked if they knew about it & felt the disaster. Almost all (98.4%) said they knew about it (Table 28).

Table 28 : Knowledge about Gujrat Earthquake

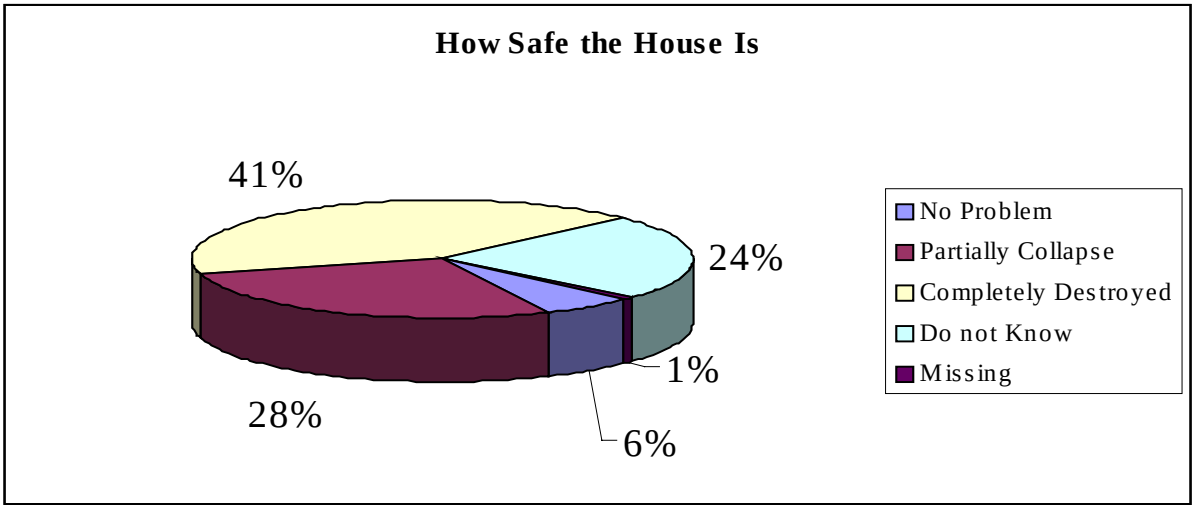
Knowledge	Household	
	No	**Percentage**
Yes	117	98.4
No	1	0.8
Missing	1	0.8
Total	**119**	**100**

When they were asked about how safe they were in the valley if earthquake of same scale occurred in the valley, 42 percent thought their houses will be completely destroyed and 27.7% said their houses

will partially collapse. Only 6% said there will be no problem to them. However, 23.5% said they did not know anything about it (Table 29).

Table 29 : Whether this houses be safe if Gujrat Scale Earthquake occurs in Kathmandu?

Perception	Household	
	No	Percentage
No Problem	7	5.9
Partially Collapse	33	27.7
Completely Destroyed	50	42.0
Do not Know	28	23.5
Missing	1	0.8
Total	**119**	**100**



They were also asked what they would do in such a panic if such an earthquake hazard occurred when they were inside a building. More than half (53%) said they would run out of the building. Some other said they would run in panic or take shelter under a table (Table 30). When they were asked whether earthquake was God's wish, nearly one-third (31.1%) said it was & the rest (63.9%) said no it was not (Table 31).

Table 30 : What will be done if similar earthquake is experienced inside a building?

Possible Measures	Household	
	No	Percentage
Go out of Building	64	53.8
Run in Panic	13	10.9
Go to Roof	1	0.8
Go to Under Table	11	9.2
Others	23	19.3
Missing	7	5.9
Total	**119**	**100**

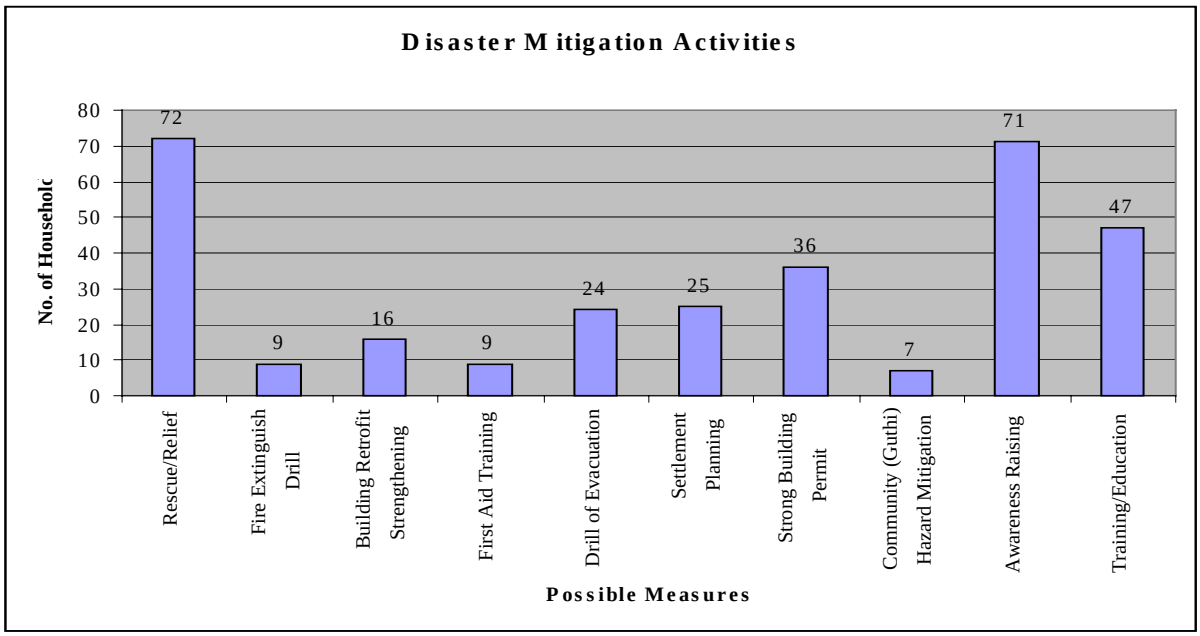
Table 31 : Perception about Earthquake

Perception	Household	
	No	Percentage
Earthquake is God's Wish	37	31.1
No it is not	76	63.9
Missing	6	5.0
Total	**119**	**100**

They were asked about what kind of disaster mitigation activities they were interested in. Several residents were interested in more than one activity. But most frequently mentioned activities were the interest in rescue/ relief & the awareness raising activities (Table 32). Some of the other activities mentioned were training/ education, strong building permits, settlement planning & the drill of evacuation.

Table 32 : Disaster Mitigation Activities of Interest

Possible Measures	Household	
	No	Percentage
Rescue/Relief	72	22.8
Fire Extinguish Drill	9	2.8
Building Retrofit Strengthening	16	5.1
First Aid Training	9	2.8
Drill of Evacuation	24	7.6
Settlement Planning	25	7.9
Strong Building Permit	36	11.4
Community (*Guthi*) Hazard Mitigation	7	2.2
Awareness Raising	71	22.5
Training/Education	47	14.9
Total	**316**	**100**



Most of the residents knew about earthquake mitigation information from various sources and television (32.8%) and radio (29.8%) were the most frequently mentioned sources of information (Table 33).

Table 33 : Sources of Information about Earthquake Disaster Mitigation

Sources of Income	Household	
	No	**Percentage**
Family Elders	16	6.7
Friends	29	12.2
TV	78	32.8
Books, Magazines	44	18.5
Radio	71	29.8
Total	**238**	**100**

There were more people (57.1%) who had not read any earthquake related materials (documents) than those who had read (39.5%) (Table 34).

Table 34 : Familiar with Earthquake Literature

Familiarity	Household	
	No	**Percentage**
Have Read the Materials	47	39.5
Have not Read	68	57.1
Missing	4	3.4
Total	**119**	**100**

When the households were asked whether they would choose earthquake resistant school for their children, nearly half of them (46.2%) said yes they would choose such schools as their first priority and for 34.5% this could also be a part of the precondition.

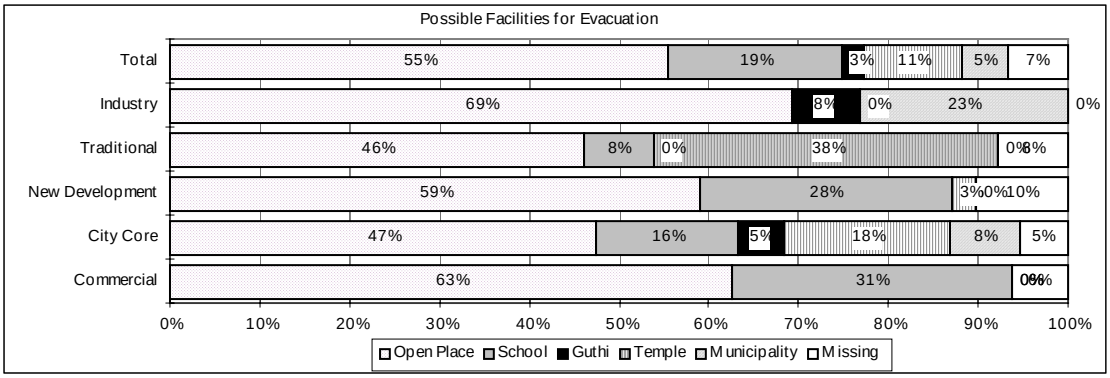
When they were asked whether they were willing to help the schools in improving the earthquake safety measure & if so to what extent, majority of them (85.7%) said they were willing to help to some what extent (56.3%) and some (30.3%) said they would help as much as possible. If the school collapsed, 42.9% said they would not blame any. For 31.1% it was the school management committee to be blamed; 12.6% said they would blame the Government. The households were asked if there was a need for earthquake information in the school curricula. An overwhelming majority (93.3%) perceived for such a need (see Annex I - Tables 49-53).

Possible Facilities for Evacuation

Irrespective of which cluster they belonged to, most of the households invariably mentioned that 'open space' was the possible facility for evacuation. Except for the households of industry cluster, for all others school was the second most mentioned possible facility for evacuation. (Table 35)

Table 35 : Facilities for Evacuation by Cluster

	Commercial	City Core	New Development	Traditional	Industry	Total
School	31.3%	15.8%	28.2%	7.7%	0.0%	19%
Guthi	0.0%	5.3%	0.0%	0.0%	7.7%	3%
Temple	0.0%	18.4%	2.6%	38.5%	0.0%	11%
Municipality	0.0%	7.9%	0.0%	0.0%	23.1%	5%
Open Place	62.5%	47.4%	59.0%	46.2%	69.2%	55%
Missing	6.3%	5.3%	10.3%	7.7%	0.0%	7%
Total	100%	100%	100%	100%	100%	100%



4.3 Facilities at Hand

They were asked how would they evacuate in case of earthquake disaster. Majority of them (62.6%) said their whole family will be mobilized. Second frequently suggested way of evacuation was community mobilization (Table 36). They were also asked about how they would carry the injured. Most of them said they would carry manually as well as by stretcher (59.7%). Nineteen households (13.7%) said they would use an ambulance (Table 37).

Table 36 : If Earthquake Disaster Prevails how do you Evacuate?

Way of Evaluation	Household	
	No	Percentage
Whole Family will be Engaged	82	62.6
Community	23	17.5
Use of Voluntary Helps	6	4.6
Individual	9	6.9
Depend Upon Situation	11	8.4
Total	**131**	**100**

Table 37 : In Emergency Way of Carrying a Patient

Mode of Transport	Household	
	No	Percentage
Ambulance	19	13.7
Taxi	8	5.8
Private Car	3	2.1
Carry Manually	54	38.8
Stretcher	29	20.9
Others	26	18.7
Total	**139**	**100**

Information was sought on the stocks of food and water households usually kept in their houses. Most of the residents (44.4%) reported that they had food stock for 2-4 weeks. One-fifth reported that they had the stock for 1 to 2 weeks. Nearly one third (32%) of the households had water for only one day. Forty percent said they had a stock of water enough for 3 days (see Annex I - Table 54).

They were asked what would they do if they lost their home in the disaster. Most of them (60.1%) said they would construct the home at the same place. One-fifth of the households said they would wait for some public financial assistance. Few of them (14%) said they would look for loan assistance.

Only 4% said they would migrate. This shows how much sentimental attachment Nepalese have on their parental land (Table 38).

Table 38 : In Case Own House is lost in Disaster

Measure	Household	
	No	**Percentage**
Build New One at the Same Place	92	60.1
Migrate	6	3.9
Wait for Public Financial Assistance	31	20.3
Ask Financial Loan	21	13.7
Others	3	2.0
Total	**153**	**100**

Housing Loan in Nepal

- *Institutions providing loans for house construction are Provident Fund Office, Commercial Banks, National Bank (Nepal Rastra Bank) and other financial institutions. The Provident Fund Office provide loans to its depositors @12.5 % interest rate, where as Commercial and National Bank provides housing loan to their staffs at very nominal service charge and against collateral.*

- *Corporate bodies provide housing loans to their staff according to their rules and regulation. The amount they provide as housing loan is not accountable, because they have not published it in the annual report.*

- *Nepal Housing and Finance Company provide loans to general public to complete the unfinished house or to improve the building standard @15 % interest rate.*

- *Financial institutions like commercial banks and other financial institution provide loan for interest building construction and housing at exuberant interest rate of 15 to 20 percent against the fixed property as collateral.*

The process of getting housing loans by general public is very lengthy and complicated and at the same time the interest rates are very high. Therefore very few people dare to venture to construct houses with the money borrowed from financial institution. The Nepali people generally tend to build their houses in incremental ways with their savings and with the money obtained from selling lands.

Lack of easy access to financial institution for housing construction is one of the main hindrances to formal housing development by private sector. There is no regular programme for housing construction even by public institutions. Therefore the informal sector house owners building their own house are the characteristic of housing development in Nepalese context.

A recently established private company has started to develop a housing colony in form of (row houses and apartments) for the purpose of selling to general public.

It is usually assumed that Nepalese society is highly stratified on various grounds & caste is one of them. So they were asked to express their preference of living in the temporary houses/ shelters. Whether they would prefer to be placed on individual family basis, or caste/ ethnic group wise, or in the mixed housing arrangements. Half of the households expressed their preference to live in mixed environment. Nearly one-third preferred as individual families and only 15% preferred to be according to their own caste/ ethnic group. This is an indication that they are gradually becoming less discriminatory (Table 39).

Table 39 : Preference of Temporary Houses

Preference	Household	
	No	**Percentage**
Should be provided to Individual Family	37	31.1
Should be provided on Caste/Ethnic Groups	18	15.1
Mixed	59	49.6
Missing	5	4.2
Total	**119**	**100**

They were asked how hazardous the kerosene & gas cylinder shops were? Only 45.4% said very hazardous. Thirty one percent thought they were partially hazardous. To nearly one-fifth of the household it was not a problem (Table 40).

Table 40 : Perception regarding Kerosene & Gas Cylinder Shops

Perception	Household	
	No	**Percentage**
Very Hazardous	54	45.4
Partially Hazardous	37	31.1
No Problem	23	19.3
Missing	5	4.2
Total	**119**	**100**

4.4 Improvement Needs and Mitigation Potentials

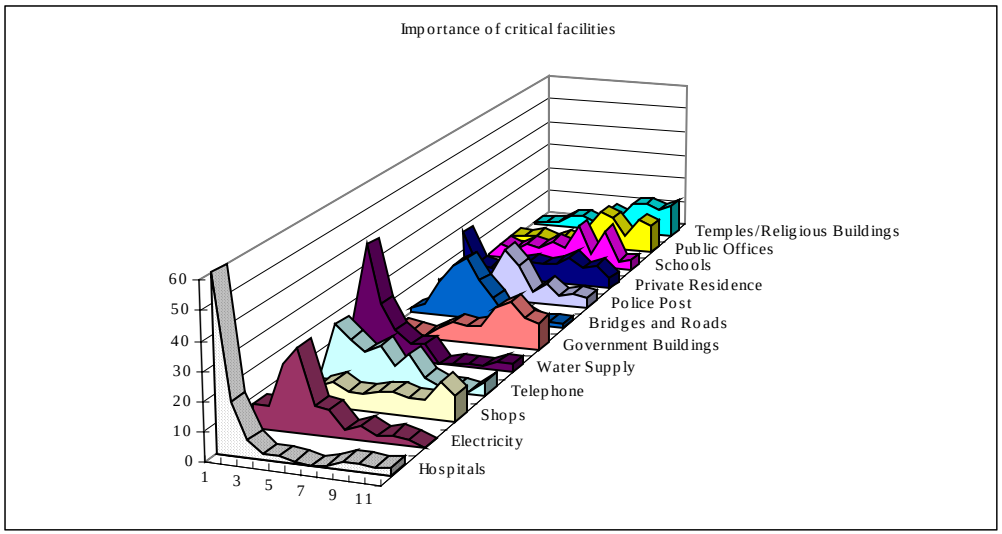
An attempt was made to know the potentiality of disaster mitigation. The residents were asked if they were willing to retrofit their houses. Four-fifths of the households said they willing to retrofit whereas 14% said they were unwilling.

After the households were informed of the cost of retrofitting as nearly Rs. 120/sq ft, and were asked if they were still willing to retrofit their house, 53% of the households said they could not afford the cost and 28% said they were willing to retrofit. Majority of the households (90.8%) said they were willing to learn more about the earthquake disaster mitigation and only 7% said they did not need to learn (Annex I-Tables 56-58). They were also asked if they could assist in rescue & relief after an earthquake. More than half (55.5%) said they could assist to some extent and 42% said they would fully assist (see Annex I - Tables 59).

In case of earthquake, several critical facilities could be damaged. Some of such critical facilities were hospitals, electricity, shops, telephones, water supply, govt. buildings, bridges & roads, police posts, private residence, schools, public offices, temples & the likes. The households were asked to mention which facilities should get the top most priorities for repair. Hospital was the most frequently mentioned facility with highest priority by 60 households & second highest priority facility was the private residence by 17 households (Table 41).

Table 41 : Importance of critical facilities

	Ranking											
	1	2	3	4	5	6	7	8	9	10	11	12
Hospitals	60	18	6	2	2	1	-	1	3	3	2	3
Electricity	8	8	23	29	10	9	3	5	2	3	2	-
Shops	1	2	7	9	6	6	7	8	6	6	13	9
Telephone	2	20	15	11	14	7	12	4	2	2	1	5
Water Supply	13	41	20	11	6	7	-	1	1	1	3	3
Government Buildings	-	3	2	1	4	7	6	7	14	17	11	10
Bridges and Roads	2	4	13	20	23	15	9	2	4	1	2	2
Police Post	5	1	6	2	10	20	14	4	8	4	5	4
Private Residence	17	5	4	3	7	8	7	8	11	7	9	4
Schools	1	6	4	7	6	9	7	16	5	15	3	4
Public Offices	2	2	3	1	3	2	8	15	13	6	13	11
Temples/Religious Buildings	1	1	2	5	5	3	9	7	12	13	11	13



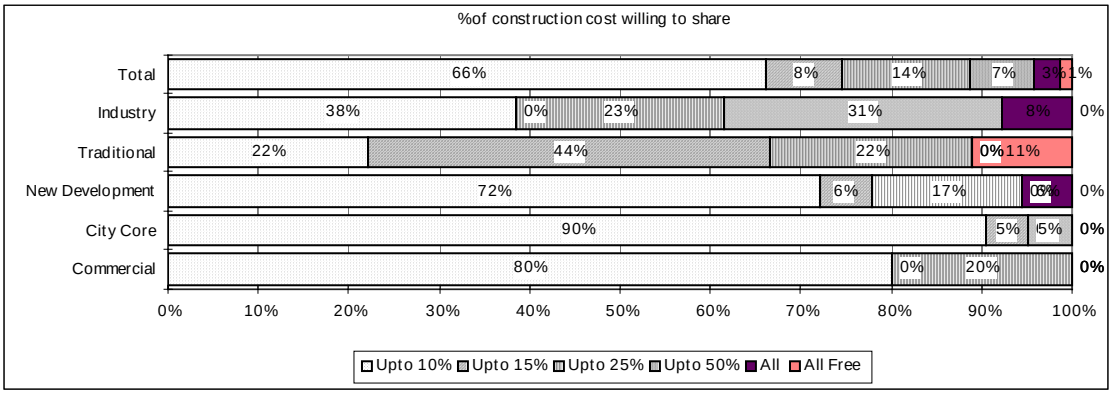
Percentage of Construction Cost Willing to Share

A cluster-wise comparison was done to see how much the households compared or differed among themselves in terms of the percentage of construction cost willing to share.

Majority of the households (72%-90%) from the new development, commercial, and city clusters mentioned that they were willing to bear 10% cost for retrofitting. More than half (54%) of the households in the industry cluster were willing to share 25%-50% of construction cost for retrofitting (Table 42)

Table 42 : Cost Sharing for Retrofitting by Cluster

Cost Sharing	Commercial	City Core	New Development	Traditional	Industry	Total
Upto 10%	80%	90%	72%	22%	38%	66%
Upto 15%	0%	5%	6%	44%	0%	8%
Upto 25%	20%	0%	17%	22%	23%	14%
Upto 50%	0%	5%	0%	0%	31%	7%
All	0%	0%	6%	0%	8%	3%
All Free	0%	0%	0%	11%	0%	1%
Total	100%	100%	100%	100%	100%	100%



The households were asked who they would blame if their houses fell apart in an earthquake. For half of the households, it was the nature that was to be blamed. Nature among the Nepalese is synonym to super natural power i.e., God. Other major reason was the luck (21.8%). Luck is also related to the nature or God. They blamed self (18.5%) for the fall of house. Blaming oneself is also similar to having fatalist viewpoint. So the fall of a house was related to fate by almost 91% of the households (Table 43).

Table 43 : Persons/Organization to be made blamed for the fall of House in Earthquake

Responsible Person/Institution/ Organization	Household	
	No	Percentage
Nature	60	50.4
Technician	2	1.7
Self	22	18.5
Luck	26	21.8
Public Authority	-	-
Others	4	3.4
Missing	5	4.2

Total	**119**	**100**

The households were asked if they wanted to ensure their house against earthquake. Fifty four percent said they were willing to ensure whereas 39.5% said they did not want. Little more than half 52.1% of the households had the little to substantial capacity to spend for insurance. Inspite of the fact that Kathmandu is getting congested very fast & pollution is at higher ground, this is still thought to be a good place to live by majority of the households (76.5%). They wanted to continue living in the same house. They were also asked what they would do if the family size increased. Little less than half (44.5%) said they would move to the New Development Area. But a significant number (24.4%) said they still would prefer to live in the same house. Some other said they would extend their houses a little bit & still live in the same house (see Annex I - Tables 60-63).

The households were then asked what would they do to share few essential things with others if their houses were destroyed and they were to be evacuated somewhere else. An overwhelming majority (83.2%) said they would not mind in sharing food, water & shelter with others. Only 11% said they would only share these items among the same caste/ ethnic group (Table 44).

Table 44 : Viewpoint on Sharing Food, Water & Shelter with Others if One's House is Destroyed & Evacuation is Made

Item / Viewpoint	Food	Water	Shelter
Do not mind at all	99 (83.2)	99 (83.2)	99 (83.2)
Cannot share with Certain Caste	3 (2.5)	3 (2.5)	3 (2.5)
Cannot Share with Different Religion	2 (1.7)	2 (1.7)	2 (1.7)
Can Only Share with the Same Caste	13 (10.9)	13 (10.9)	13 (10.9)
Missing	2 (1.7)	2 (1.7)	2 (1.7)
Total	**119**	**119**	**119**

N.B. Figures in the parenthesis are percentages.

V. CITY STRUCTURE

5.1 Overview of the Land use in Kathmandu Valley

In the last few decades dramatic changes have taken place in the land use of the Kathmandu Valley. Available data show that out of the 63,964 ha mapped in 1984 only 5.5 percent was non-agricultural area, 64 percent was agricultural area and 30.4 percent was forest area. Mapping exercise done by KVTDC in 2000 with a slightly changed definition of the Kathmandu Valley shows that out of the total 66,656 ha about 10.4 percent comprised of urban areas, 16.5 percent rural areas, 41.4 percent agricultural area and 31 percent forest area. Thus the land use of the valley can be broadly classified in the three major categories-agricultural, non- agricultural and forest. The agricultural land consists of those areas, which are predominately being used for the agricultural and farming purpose and vegetable and fruit productions. It includes land of both urban as well as rural areas. While forest consists of natural as well as community forest, bush and grassland, similarly of both urban and rural areas. The non-agriculture land is further classified to be within urban area and rural area. For simplicity urban area is identified to represent the municipalities, while the rural area is identified to represent the village development committees (VDCs). Within urban area, there is great land use variation; hence following land use classification is formulated in order to reveal existing land uses. They are residential, mixed land use, commercial, institutional, industrial, recreational/ open space, transportation, public utilities, military, special areas and water bodies. The rural area on the other hand depicts both new residential developments, either developed along the arterial roads or scattered in a haphazard way, besides several traditional village settlement pockets. The different land uses of the Kathmandu Valley for year 2000 is identified as below.

Land Use of the Kathmandu Valley

S.No.	Land use	Area in hectares in Year 2000	Land use by type in % (2000)
1	Agriculture	27,570	41.4
2	Forest	20,677	31.0
3	Non-agriculture	18,408	27.6
3.1	Urban area	(6915.0)	10.4
3.1.1	Residential	4829.0	
3.1.2	Mixed residential/Commercial	423	
3.1.3	Commercial	19	
3.1.4	Industrial	210	
3.1.5	Institutional	518	
3.1.6	Military	150	
3.1.7	Public Utilities	28	
3.1.8	Transportation	310	
3.1.9	Special area	272	
3.1.10	Recreational/open space	156	
3.2	Rural area	(10,997.0)	16.5
3.2.1	Residential	2592.7	
3.2.2	Rural settlement	8404.3	
3.3	Water Body	496	0.7
3.4	Others ***Abandoned land, airport, pond etc***		
Total		**66,655.0**	**100**

Source: Kathmandu Valley Development Plan 2020 1st draft.

5.2. General Characteristics and City development

Centuries of habitation in the Valley have illustrated that man is an important factor in the creation of the existing physical setting. Innumerable small fields, water canals and flights of terraces take utmost advantage of the natural configuration of the land and reshaped the surface of the valley far up the slopes of its surrounding hills. Most of the prominent settlement representing Newar community of the valley date back to the beginning of the Malla period (thirteenth to eighteenth centuries) and have remained in the compact forms that were established then. Closely spaced houses with narrow streets and small courtyards located mostly on up land plains between or along rivers are uniformly built of bricks, clay tiles and timber.

In spite of variations in size, geographic location and economic activities of their inhabitants, the Newar settlements were not radically different from one another irrespective of whether they were called towns or villages. Still, they were far from merely smaller or larger additions of single housing units designed to provide shelters – they formed institutional and social units of performing the various functions involved in the life of the people.

Aside from the historic necessity for defense and the need for proximity to cultivated fields, the compact form of vertically oriented living is motivated by a strong concern for preserving the rich agricultural land and avoiding its inefficient use.

As an outgrowth of, as well as a motivating factor for this compact settlement pattern, the social cohesion and organization of its inhabitants shows marked differences from the situation found in traditional dispersed agricultural settlements, in and out of the valley. These settlements also represents a strong-economic frame work for maintaining of compact groups large enough to broaden association beyond tight extended-family circles and include a majority of functionally evolved castes.

Apart from their own specific religious and economic functions – in addition to generally observed Newar festivals, almost all of the settlements have their own festivals connected with particular village or Neighborhood deities. The physical townscape of the settlements is based on a rather uniform concept. Most towns and villages have some direct association with gods or temples. The central area of the town is marked by an open space upon which streets and road converge. Often the space is the site of the temple to the village or neighborhood god, forming along with water ponds sunked waterspout, sattals & patis (public resting-places), the nuclear around which the settlement grows. This association of the settlements with physical structures dedicated to the gods is very important to their organization. There are two major patterns. The temples may be within the core of the settlements, set in extensive open spaces, as the temples complex in Durbar squares of Kathmandu, Patan and Bhaktapur dedicated to Taleju and other deities: in Kirtipur dedicated to Bag Bhairab, and in Bungamati dedicated to the Machhendranath, or they may be outside the settlement, as Vajra Varahi at Chapagaoun or Vajrayogini at Sankhu.

This lay out is not oriented towards horizontal expansion so population growth occurs vertically. Naturally, the detailed settlement plans differ according to the geographic characteristics of the site. Generally, the streets of most settlements are more or less straight, often forming fairly rectangular patterns.

The streets are mostly brick or stone paved and the houses, of rather uniform height, seldom over three and one-half stories, built on either side have at least the brick walls of the compounds adjoining. Those enclosing a courtyard are sometimes secular growths of earlier monastic units and are termed bahals- this is particularly true in the three cities (Kathmandu, Patan & Bhaktapur) of the Valley. In most courtyards there are small freestanding shrines. Of functional and visual importance are the open ponds, sunken waterspouts and wells existing in each settlement. These (wells & waterspouts) are found either in partially or totally enclosed courtyards or frequently as twin ponds at either end of the main road. These factors coupled with a lack of unutilized housing spaces within the compact settlements create a generally homogeneous character throughout.

Of distinctly different character are the habitations and settlements built after the conquest of the Valley of by King Prithivi Narayan Shah of Gorkha in 1768-1769. These groups of people (Brahmin and Chhetri Communities) were not generally as well integrated or as closely knit as the Newar society. Families, representing a variety of castes and occupational groups, were more independent. The resulting settlements were dispersed rather than compact grouping of houses. Traditionally mountain and hill people, these new comers settled mostly along the hilly rim in areas of differentiated slopes; Soil quality and fertility were consequently insufficient to support large concentration of people. Development patterns shows that major differences between the Newar settlements, where primary considerations were defense and social continuity, and the latter dispersed settlements where there was little concern about defense and less initial social unity to maintain.

Recent Suburban Development

The failure to implement any of the far sighted overall planning strategies recommended by the 1969 Kathmandu Valley Physical development plan in the third quarter of the 20th century has resulted in sprawling and unplanned suburban development within and outside municipal boundaries. In contrast to the compact and ordered traditional cities (Kathmandu, Patan and Bhaktapur City Cores), with plans based on some sort of grid (although the plan of Bhaktapur is less regular), the houses, reached by winding and usually narrow roads and lanes developed from the paths between the former rice fields. Suburban development has provided housing for families moving into the Kathmandu Valley from elsewhere in Nepal and beyond Nepal boundary, but also represents a migration of the well –to-do from traditional city centers. Those who have remained in the city cores have often demolished their traditional houses and replaced by modern concrete tall structure, often violating the existing building height regulation.

Newari Settlement (City Core Area & Traditional Settlements)

The Newari people, who are the original inhabitants of the Kathmandu Valley and responsible for much of the high culture of Nepal, developed a unique culture which is highly urban in character. Living in a society with strong social links based on the guthi system, they traditionally preferred to live in compact settlements, the streets lined with continuous rows of brick and timber houses. Thus even villages have the character of small towns and the houses themselves, which can date to the 17th century or even earlier, are frequently richly decorated with artistic woodcarvings and moulded terracotta. As such, They are closely related in style to the architecture of more important monuments, such as palaces and temples. Examples are Kathamndu, Bhaktapur, Lalitpur/ Patan city core areas Kirtipur, Thimi, Tokha, Panga, Khokana settlements.

New Development Area

Urbanization in the Kaththmandu Valley commenced in mid 1950s and it peaked up between 1971 and 1991. The period coincided with rapid industrial and institutional growth. The concentration of all-social, political, physical, financial, institutional, transportation and communication networks facilities in the valley towns and severe deficiency of such facilities in other parts of the country is responsible for rapid urbanization of this valley. Urban expansion in the Kathmandu Valley, excluding the city core areas of Kathmandu, Lalitpur & Bhaktapur is horizontal rather than vertical. In early days, major growth occurred along the city arterial roads leading to Maharajgunj, Jawalakhel, Gaushala and others. The construction of Arniko highway and the "ring road" in Kathmandu and Lalitpur municipality areas provided opportunity for urban expansion. It is now beyond the municipal boundaries on agricultural areas.

Construction of Ring road in the mid 1970's induced development in surrounding areas specially Balaju, Maharajgunj, Bansbari, Chabahil, Koteswore, Satdobato, Balkhu, Kalanki, while the areas along the radial roads and the flood plains of Bagmati, Bishnumati and Dhobikhola are developed after 1981. An area between Kathmandu and Lalitpur municipality and Bhaktapur has been developed recently. Some old settlements such as Thimi, Kirtipur, Chapagaon, Lubhu, Boudha, Budhanilkantha have rapid urbanization. It has been visualized that in 2020 AD, the present day five municipalities and their adjoining areas will form one urban mass.

Currently about 40 percent of the total village development committees (VDCs) of the valley have urban to semi urban development characteristics.

The public sector did not guide urban development by infrastructure extension. Rather people developed lands along the existing major arterial roads mainly constructed for the inter city traffic movements which guided urban expansion. This phenomena encouraged ribbon development along the major roads. The inner land remained unserved by the roads. The further demand of land for housing encouraged the inner land development in a scattered and unplanned manner e.g. Koteswore, Budha Nagar, Katunje, Kalimati, Balaju, Jorpati, Kapan, Dhapasi etc as well as in planned manner (Land Pooling and site & service areas such as Gongabu, Kuleswore, Saibu, Nayabazar, Dallu, Galphutar, Sinchitar, Chabihil Gopi Krishna areas etc).

- Commercial Area: - New road constructed after 1934 earthquake is the first commercial area in the post 1934 earthquake era. The traditional commercial streets are Asan-Indra Chowk in Kathmandu, Mangal Bazar in Lalitpur and Tachapal – Sukuldhoka- Nasmana road in Bhaktapur. With the rapid urbanization and urban expansion new commercial streets emerged, they are Putalisadak, Bagbazar, Dillibazar, Kalimati, Kapundol, Chabahil and Jawalkhel -lagankhel. Ground floor of the almost all houses abutting the new commercial streets with wider road are used as shops, 1st and 2nd floors are used as shops, private offices and restaurants. The 3rd and 4th floors are used as the residential premises of the house owners. Congestion and lack of parking facilities are the common characteristics of all the commercial areas.

Table 45 : Characteristics of Sample Area

S.N.	Sample Area	Region (Administra-tive Boundary)	Zone Land use	Density (>500p/ha - High) (>200p/ha - Med) (>100p/ha – Low med) (<100p/ha – Low)	Historical Development Setting					Water sources	Availability of Evacuation a Area	Road Width	Building Type		Sample No
					Traditional or Modern	New Development									
						Formal	Informal	Urban	Rural						
1	New Road	KMC	Residential	High	Traditional	✓	✓	✓	-	Municipal Supply + Well	Traditional Open Space diminished to almost new existence	Narrow	✓	-	6
2	Ason	KMC	,,	,,	,,	-	-	✓	-	,, + well	,,	,,	✓	-	6
3	Kirtipur	Kirtipur	,,	,,	,,	-	-	✓	-	,, + well + spout	,,	,,	✓	-	3
4	Thimi	Madhyapur	,, (mixed)	,,	,,	-	-	✓	-	,, +well	,,	,,	✓	-	4
5	Lalitpur	Lalitpur	,,	,,	,,	-	-	✓	-	,, + well + spout	,,	,,	✓	-	8
6	Bhaktapur	Bhaktapur	,,	,,	,,	-	-	✓	-	,,	,,	,,	✓	-	11
7	Budha Nagar	KMC	Residential	Low	Modern	-	✓	✓	-	Municipal supply	Not exists	,,	-	✓	5
8	Kuleswore	KMC	,,	Low to medium	,,	✓	-	✓	-	,,	open spaces available	Sufficie ntly wide	-	✓	5
9	Gangaboo	KMC	,,	low	,,	✓	✓	✓	✓	,,	open spaces available in formal development	,,	-	✓	5
10	Putalisadak	KMC	Mixed (comm+resi)	low to medium	,,	-	✓	✓	-	,,	Not exists	Wide	✓	-	6
11	Kalimati	KMC	Residential	,,	,,	-	✓	✓	-	,,	,,	,,	✓	-	6
12	Panga	Kirtipur	,,	low	,,	-	✓	✓	-	,,+well	,,	Narrow	-	✓	2
13	Bhaktapur	Bhaktapur	,,	,,	,,	-	✓	✓	-	Municipal supply	,,	,,	-	✓	2
14	Thimi	Madhyapur	,,	,,	,,	-	✓	✓	-	,,	,,	,,	-	✓	1
15	Lalitpur	Lalitpur	,,	,,	,,	-	✓	✓	-	,,	,,	,,	-	✓	2
16	Katunje	Katunje VDC Bhaktapur	,,	,,	,,	-	✓	-	✓	Municipal supply + spring	,,	,,	-	✓	5
17	Tokha	VDC in KTM	,,	Medium	Traditional	-	✓	-	✓	Spring	exists	,,	✓	-	3

S.N.	Sample Area	Region (Administra-tive Boundary)	Zone Land use	Density (>500p/ha - High) (>200p/ha - Med) (>100p/ha – Low med) (<100p/ha – Low)	Historical Development Setting					Water sources	Availability of Evacuation a Area	Road Width	Building Type		Sample No
					Traditional or Modern	New Development									
						Formal	Informal	Urban	Rural						
18	Khokna	VDC in Lalitpur	,,	,,	,,	-	✓	-	✓	Spring +pond	,,	,,	✓	-	10
19	New Road	KMC	Mixed use (comm+ Resi)	high	post 1934 EQ. reconstructi on	-	✓	✓	-	Municipal Supply	,,	Narrow	✓	-	4
20	Ason	KMC	,,	,,	Tradition + Modern	-	✓	✓	-	,,	,,	Wide	✓	-	4
21	Kalimati	KMC	,,	Medium	-	-	✓	✓	-	,,	Not exists	Wide	✓	-	4
22	Putalisadak	KMC	,,	,,	Modern	-	✓	✓	-	,,	,,	,,	✓	-	4
23	Balaju	KMC	Industrial	low to medium	,,	✓	-	✓	-	,,	Not exists	Sufficie ntly Wide	-	✓	14

VI. SOCIAL COHESION AND MUTUALITY

6.1. *Guthi*- A Community Based Organization

In the socio-economic composition of the Nepalese society, the Guthi (endowment) system plays a very important role. Guthi is an age-old tradition. Although Guthi was overwhelmingly present in the Kathmandu Valley, it is found everywhere in Nepal, especially around religious shrines and traditional settlements. In order to conserve the time old charity tradition, the Guthi Corporation was created and is running until the present time. Broadly speaking, any person or a group of persons with social service motto or religious reasons join together and voluntarily create an endowment/Guthi by offering private property, cash or kind, including landed property for the sake of sustaining worship in temples, maintenance of public rest houses for pilgrims and several other socio-religious functions. Such landed and other immovable property is so vast that the Guthi corporation runs branches in 11 districts and the Land Revenue District office of HMG looks after this in 60 districts (Guthi Corporation Inventory, 1999).

The Inventory lists the following statistics:

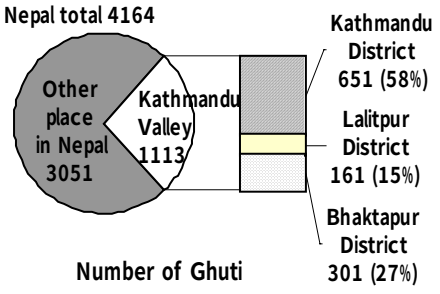
Guthi owned landed property:
Tarai 41273.125 Ha (66037 Bigha)
Hills 5,16,332 Ropani

Guthi Managed :

Temples	712
Rest Houses	647
Ponds	159

No. of Guthi :

Nepal	4164
Kathmandu Valley	1113
Kathmandu District	651
Lalitpur District	161
Bhaktapur District	301



Forms of Guthi:
Basically there are four forms of Guthi. They are a. Religious Guthi b. Guthi for Social Service c. *Guthi* for Entertainment and d. Caste Guthi.

The Guthis appear to be religious in nature but they perform innumerable social functions. In fact, they are very strong cohesive factors uniting several segments of society. The temples and rest houses run by the Guthis are venue for socio-religious functions including marriages, initiation ceremonies and other kinds of social feasting in times of peace. In times of calamities these venues provide excellent rescue and relief sites. Thus, the Guthis are useful both during peace and disaster.

But these infrastructures have faced financial problems also in the recent past. According to the *Guthi* corporation inventory, 1999, majority of the rest houses and many temple premises are almost dilapidated and need a good amount of maintenance efforts. The corporation has leased out of a large number of physical facilities – houses, shops, fishing, ponds etc- but the leases, both government and private owe a large amount of revenue to the corporation. So, it is facing financial crises time and again. Moreover, such *Guthi* land used by the private people are gradually being converted to the private land which further complicates the problem.

The present study recognized the importance of the role of Guthis and has made several references both as problems and as means of mitigating the disaster. Since the study is concentrated in Kathmandu valley, and Newars were the native people of this valley in the past, a quick review of their Guthi system will be of great importance to understand how the Newar society is still organised and their values and norms are greatly influenced by the guthi which still acts as an anchor. If properly mobilized, the Guthis can become effective NGOs in their respective areas.

In the present study there are several references to Guthis both in the urban and rural settlements. As these Guthis are religious in sentiment and cohesive in social structure, they can be of immense help during disaster. But Guthis are not popular in new settlements. For such areas, other social organizations / NGOs may provide substitute for them if there is proper mobilization and training.

6.2. *Guthi*- Among the Newars

Guthi is derived from the term "Gosthi", meaning an organization with the socio-cultural & religious character.

While caste or sub-caste sets the limit to the general status- position of a person in the total society, his ritual and social life is regulated and controlled through these "*guthi*" institutions. The Newar society is notable for its numerous *Guthi* institutions which grant membership to the individual household groups. These *Guthi*s divide the Newars horizontally in a number of groups for achieving different objectives.

Lichhavi period (1st to 8th century) is the base period of present *Guthi* organization among the Newars. During this period, *Guthi* had important role to play on the social & religious life. Following the Lichhavi period, during the Medieval period too *Guthi* was mainly concerned with social rites & rituals. *Guthi*s could be seen as the important institutions which had a great role to preserve the temples constructed during the Medieval period. Each Newar in one way or the other is associated with his *Guthi* in his society. It is generally ascribed by his family tradition. Each *Guthi* has its own rules and regulations which must be strictly observed by its members.

In the event of sanctions imposed by any of the *Guthi*s, the social living of a defaulting household becomes quite miserable. *Guthi*s are classified according to the functions they perform, such as religious, social and cultural functions. Gopal Singh Nepali in his book "The Newars" mentions 8 different types of *guthi*s among the Sana-*guthi* caste members (Nasa Puja *Guthi*, Ashtami *Guthi*, Chare *Guthi*, Bijhi *Guthi*, Nisala Chhaya *Guthi*, Holi *Guthi*, Saju Puja *Guthi*, & Doshami *Guthi*).

Among the Dewali *guthi* also known as the Fukee *guthi* which are responsible for worshipping the dewali deities (ancestral deities) are the following: Bhimsu *Guthi*, Gula Paru Bhue *Guthi*, Sithi-Nakha *Guthi*. Unlike the Sana *Guthi*, its membership is neither acquired nor based on the local grouping. Its members may be spread over the different regions. But at times of feasts, & the worship of the "Dewali", they must come together to participate. Married daughters are excluded from this "*guthi*". The persistent call of the "Dewali *Guthi*" is such that nobody can ignore its worship and the feasts connected with it.

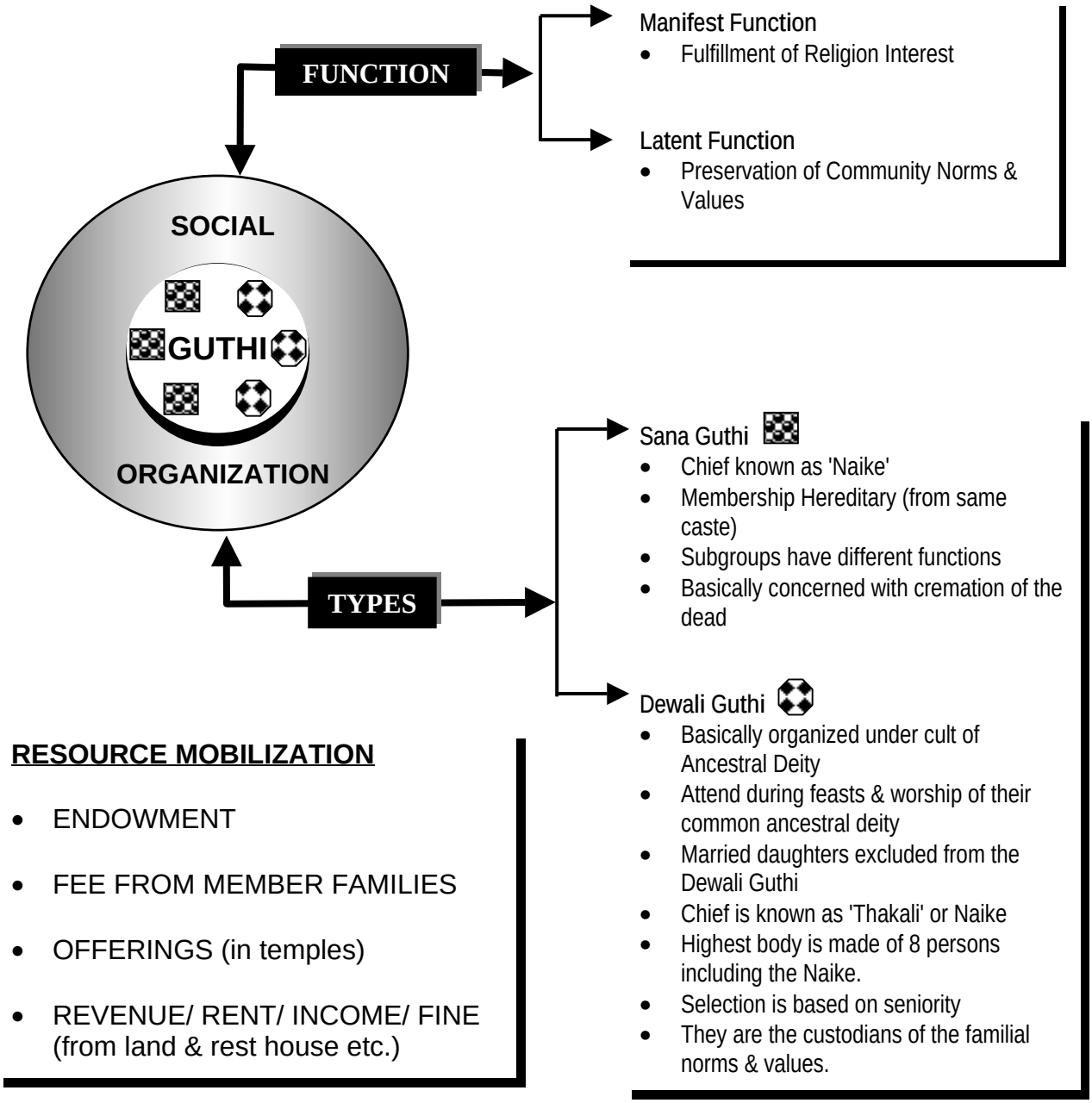
The entire network of social relations in the Newar community is kept strong through the feasts & festivals under the auspices of the various *guthi*s. These feasts and festivals are numerous. It is

through the participation in these feasts that a Newar individual enjoys the protection of the society. Solidarity is sought to be maintained through the feasts & festivals on four different levels- family, patrilinial groupings, caste and community. On the other hand, the feasts & festivals not only affect the integration of the different living individuals but also act as a bridge between the living and the dead. In the Newar social organization, the living & the dead both go to make the social group. Thus the sum total of Newar culture traits goes to make such an institutional complex that there is complete integration of the individual with the society.

Problems: However, *Guthis* have faced some problems in the recent past. In the valley, younger generation has been relatively more mobile and gradually moving outside the core city clusters. This situation forces the traditional *Guthi* members to still get affiliated loosely with their respective *Guthis* but they also need be to linked up with some other type of associations in the new neighborhood. New jobs also require the members move away. It is the older generation which still maintains the community norms. Survey results indicate that *Guthi* members met in their *Guthi* only during funeral and festival times (p.58). Thus, manifest function (fulfilling the religious interests) tend to be still intact but the latent function (preservation of community norms and values) of *Guthi* seem to be facing problem.

In short, following diagram may explain the types and functions of a typical Newari Guthi.

Guthi among the Newars



6.3 Possibilities of Promoting CBOs in New Development Areas

Historically, different communities have coexisted with mutual help & cooperation in Nepal. There has been a cultural & religious tolerance. In particular, Hidus & Buddhists have been visiting the temples & the monasteries & worshipping each other's Gods & Goddesses. There has been tradition of self-help organizations such as the *Guthi* among the Newars, 'Bheja' among the Magars of hilly part of Nawalparasi & adjoining region of Palpa districts. However, the process of urbanization has attracted the rural people to the cities and Kathmandu valley has experienced the most influx of population due to both the pull factors of Kathmandu & the push factors existing in the villages & out

of the valley districts. If the past trend continues in the future, Kathmandu valley will continue facing the problem of population pressure. Security problem in the outside districts have even forced hundreds of families who have been continuously pouring to the valley & making more & more buildings.

In the city core, the Newars are still in tact. Their existing social organization work as binding force for mutual cooperation. But in the newly developed areas, people have come from different locality & gradually have to work together to arrange facilities of common interest such as the road, electricity, drinking water & the sewage.

Moreover, the lanes are narrow, there is no established institution in action (such as the *Guthi*) or any earlier acquaintance among the newly settled residents. In such situations some kind of organization which could produce an environment to work together for common goal becomes very important.

One of such an organization would be the Ward Office within a Municipality and a Village Development Council (VDC). However, a Ward could still be a larger area to cover during disaster. So, a possibility was looked at knowing the opportunity of involving local organizations such as the clubs, associations, any non-governmental organization, any movements and the likes, which are at the grassroots level. Group meetings were arranged and opinions of residents were sought (Focus Group Meeting in Ward No. 34 of KMC and Ward No. 17 of BKP). It was very revealing to note that the participants were very enthusiastic in helping each other by getting organized in relevant groups. In both the places (Ward), there were couple of community based local organization, which could be very well prepared and used in case of disaster. They suggested that besides various clubs, schools also could be used in case of emergency.

In Baneswore meeting, they expressed their willingness in retrofitting their homes. There was also a suggestion that a complete inventory of the condition of infrastructure (including the buildings) together with resources, such as the open space, school compound etc. should be made. The municipality also should develop & strictly monitor a scientific building code in order to avoid/ reduce future risk.

Ward No. 34 of KMC has a Disaster Management Committee, which is doing preliminary survey of all houses & families as well as rehabilitation facilities. This was appreciated and the participants were very appreciative of this activity. Even Bhaktapur group promised to create one of such a committee at the ward level, which would strictly work for social works such as the disaster management.

It was also suggested that all functional clubs such as sports clubs, school association, a temple trusts etc. should be made more functional & any non-functional clubs should also be revitalized. It was realized by all that 'sensitization' & proper training for rescue were very important activities to be pursued in the future.

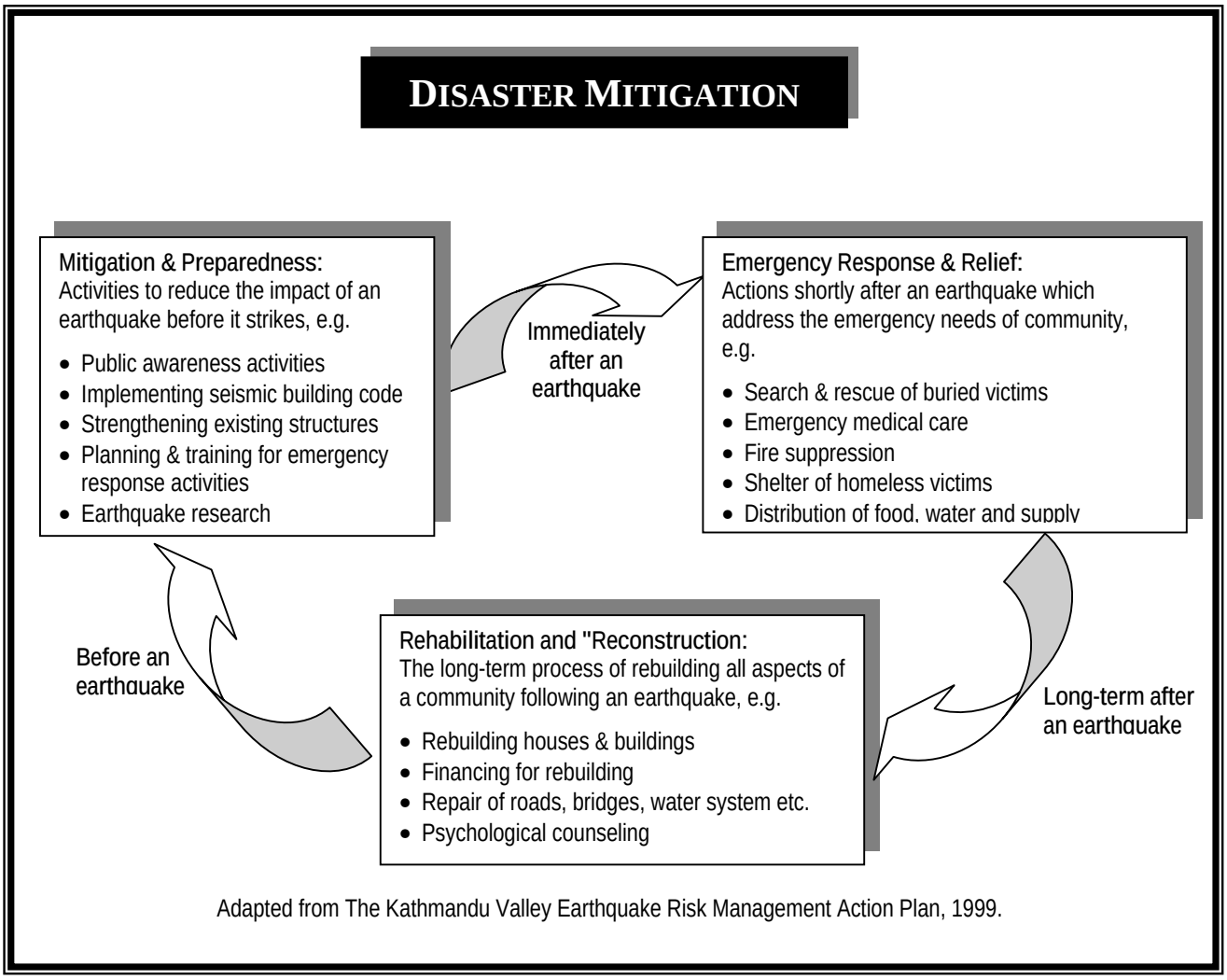
In Bhaktapur, the younger participants expressed their inability to face the dangers of new types of RCC buildings. They had heard from their grand parents that wooden beam houses used to have hooks which would tie the walls & roof in such a way that the traditional technology was less prone to earthquakes but they expressed their helplessness with the 'modern' buildings and were unaware of tricks for protecting against disaster if it happened in future. This also necessitates a good training program for mitigation. Baneswore participants also suggested the updating of mapping of houses which would help one to plan the mitigation measures in the future. In Bhaktapur the ward chair strongly expressed his desire to get involved in such activities in the future. A list of 13 local organizations engaged in socio- religious work was provided which could be useful in such disaster management.

Establishment of modern organization to initiate social welfare programs in the country started only in the 1940s. It did not grow much due to the autocratic Rana regime. However, after the turn of

democracy, the socio-political environment was more favorable to the formation of such non-formal non-governmental organization for social work. Together with village development & community development activities, the opening of NGOs got a new thrust during the post democracy period. However, the NGOs had to be within the umbrella of Government owned Social Welfare council, which had restricted the much-desired growth. Nevertheless we can say that governments' efforts to set the foundation of community development process during this period 1962- 1989 was useful to attract the interest group of social workers & activists. But most of these organizations were supposed to help the rural poor. After the introduction of multiparty parliamentary system in 1990, the political environment has had a great impact on the promotion of NGOs in Nepal and their members grew unrestricted. They could register the organization at the chief district office and / or the social welfare council. A constitutional guarantee has been given to the rights of the people to get organized in bringing about desirable changes. This is so important for the present study purpose. There is a great potentiality to involve the community-based organization for disaster management.

6.4 Towards Building a Participatory Mitigation Plan - A search for possibilities.

Documents reveal that in the last century itself 11,000 people lost their lives in four major earthquakes. The great earthquake of 1934 destroyed one-fifth and damaged 40% of the valley's building stock. Other earthquakes of similar size occurred in Kathmandu valley in the 19th century: in 1890, 1833 & 1866 AD. Experts forecast that earthquake of similar size repeats after every 75 years & such an earthquake is inevitable in the near future. Although earthquakes are natural phenomenon that can not be avoided, or even accurately predicted, the seismic safety of buildings, utilities, and transportation networks and the capability of institutions to respond to an earthquake can be greatly improved. In the disaster mitigation plan, three components may be of great importance to consider.



Adapted from The Kathmandu Valley Earthquake Risk Management Action Plan, 1999.

The diagram above suggests various actions in 3 distinct phases: a) mitigation & preparedness, which focuses on sensitization, information dissemination, law enforcement, re-strengthening of existing structures, human resource development & earthquake research. These activities are going to help us get more prepared to face the problem and reduce the magnitude of damage. b) Equally important is the planning for emergency response & relief. Since earthquake is inevitable, people will be buried in debris and they have to be searched & rescued. This also needs medical care in massive scale. Affected persons would need shelter. Electric accidents may need special fire suppression. The victims would also need immediate distribution of food, water & supplies. c) The third phase i.e. rehabilitation & reconstruction would include the assistance in rebuilding houses and buildings, financing for building, repair of roads, bridges, water system, etc. and psychological counseling.

The social structure survey leads to the impression that there exists a great deal of willingness among the people to get prepared for mitigation measures. However, the group meetings also suggest that people need sensitization and proper training. The community members, clubs & associations have expressed their willingness to get involved in such activities; among the Newars of Kathmandu valley, social organizations such as the *Guthi* exist. There are various other organizations & schools, which could also be mobilized in such activities. Thus there existed a great potentiality of making the community better prepared for facing such a disaster but as has been very rightly said that earthquakes affects everyone & everything in a community, and it is not possible for any one agency, or even the government as a whole, to manage all aspects of risk. A proper plan is needed which could cover all three phases of disaster management.

VII. DISASTER EXPERIENCE

An attempt was made to collect information regarding disaster experience. This was mostly done by three specific methods: document analysis, focussed group meetings and key informant survey.

7.1. Document Analysis:

7.1.1. Rana,Brahma Shamsher 1936. The Great Earthquake of 1934 (in Nepali)

It is a 244 paged book written in Nepali. This book is organized in 13 chapters. Altogether there had been 8,519 deaths (male: 3850 and female: 4669) and 207,740 buildings, temples & travelers' shelters (*Pati Pauwa*) were damaged.

In the preface, the author mentions that the Japanese had experienced the Great Earthquake in the year 1923 and this inspired the Japanese to learn more and better prepared for any kind of future disasters. Since that disaster, Japanese became more motivated, confident, industrious and nationalistic and began working on disaster management. The book further writes, we, the Nepalese are also a people of an independent nation so we should not get discouraged, instead, work together in getting better prepared for future disasters.

While describing the earthquake, the author mentions that on January 13, 1934, it rained 41". This was 3 days before the real event. January 15 (Magh 1) is a very religious festival known as 'Maghe Sankranti' in Nepal. Usually women do fasting; relatives, daughters & in-laws are invited and do feasting. On the second day of Magh i.e. (January 16, 1934, the temperature was around 60^0 F. People were taking sun-bath on the roof, balcony & open space. January 16, 1934 (Magh 2, 1990, Nepali Calender) was the Day which was so disastrous to the Nepali people that swept away thousands of lives and hundreds of thousands were injured.

Suddenly at 14 hrs 24 minutes & 22 seconds, there came a noise from underneath the earth. Nobody could even guess that the sound was of the great earthquake. First, people thought the earthquake was moving from the East to the West. Secondly, the earth began circling and during this movement most of the buildings collapsed. The speed was so great that even electric bulbs fell out of sockets. The earth was trembling; trees touched the ground. Water from the ponds splashed out. Doors & windows automatically opened & closed. The tall temple head (Pagoda) fell apart. These sounds were like canon blasts. All the sky got dark due to dust. Suddenly the visibility (up-to 9-ft) was lost. People ran in panic in search of open space from all sides. Some could not stand on their own feet so took support of some structure, some just crawled, some hide in the ground floor, some ran to the courtyard & some to the garden. Everybody started screaming. Some women with a belief that if they touched the ground with hand on such earthquake, it is a virtue so they did not run. But those who ran also did not get protected. They were caught between the narrow lanes & fallen buildings & got killed. Army was parading in Tudikhel (parade ground); they could not stand & so lied upside down. In the eastern side of Tundikhel, the earth cracked & fountain of water came out. At the same time clock tower in Trichandra College & Dharahara fell apart into pieces. In moments the great earthquake took away thousands of life, buildings & properties.

While reviewing the documents, the book mentions that on the same day according to some astrologers all 7 planets were supposed to be on the same alignment in the orbit and people thought the earthquake was due to this planetary alignment. They began trusting any kind of astrologer for about 6 months.

Some believed that the Snake God (*Naga*) who is supposed to hold the earth because of unbearable sins on earth, the earth became heavy & the Snake God (*Naga*) had to shift his shoulder to hold the earth. This created the earthquake.

In the same year, the Europeans had flown above Himalaya (Mount Everest) which is supposed to be a sacred place for Lord Shiva. The earthquake was due to this sinful act.

Following were some of the other effects after the earthquake as mentioned in the book.

1. For the first week after the earthquake, people thought the world was going to end so why not enjoy with good food & wear good clothes because everybody had to die. This notion appeared mostly among the women & illiterates.

2. Some lost their memory, they were restless and did not speak at all. Deeply depressed! There were quite a few of this type.

3. Some other had a good effect. They were motivated to help the needy. They devoted themselves in such social works. In short, the bad had evil activities & the good ones did virtuous things.

4. To some, the earthquake worked as the eye opener. They realized that how bad it was to depend on others. So quite a few people got interested in their own domestic products.

SUMMARY OF
ASSISTANCE FOR VICTIM OF 1934 EARTHQUAKE
IN KATHMANDU VALLEY

ORGANIZATIONS

A. GOVERNMENT

1. Army Headquarters

Functions:
- Distribution of food grain
- Supply of medicine & first aid
- Supply of drinking water
- Electricity repair
- Maintenance of ---
- Police service
- Clearing of debris

2. Municipality

Function
- Help to hospital

B. NON-GOVERNMENTAL ORGANIZATION

(i) "Earthquake Service Group"
(150 Volunteers of Teachers & Students)

Functions
- Taking the injured to hospitals
- Distribution of food & clothes
- First Aid
- Assisted, police, telecom office, post office & hospitals
- Provided information to government

(ii) His Majesty's Servant Society
(Made of Marwadi business men & others)

Functions
- Donation of food items such as rice, milk etc.
- Collection of cash and distribution to the needy

(iii) Juddha Service Association
(very few volunteers)

Functions
- Main function was to take out the dead bodies from the debris
- Provide first aid

C. EARTHQUAKE RELIEF FUND

- Fund created with a seed money of Rs. 400,000.00 by the Rana Prime Minister
- Altogether NRs. 10,75,000.00 and IC 26,200.00 was collected
- Indian & British organizations expressed their desire to donate but it was not accepted.
- The fund was used for the following purposes:

  ➔ House repair (free to poor)
  ➔ Provision of food
  ➔ Road repair
  ➔ Debris clearance
  ➔ Extending loan to repair house

D. EVACUATION & SHELTER

- Parade Ground (Tundikhel), Office Building, Tri-Chandra College, & Guest House were used for shelter
- Private Farm, Orchards & open space in Jamal were used with temporary tents
- After shelter, food was the problem & it was brought from Tarai
- 4 hospitals were opened temporarily & with the assistance of Army health personnel altogether 14,000 persons were given medical service.

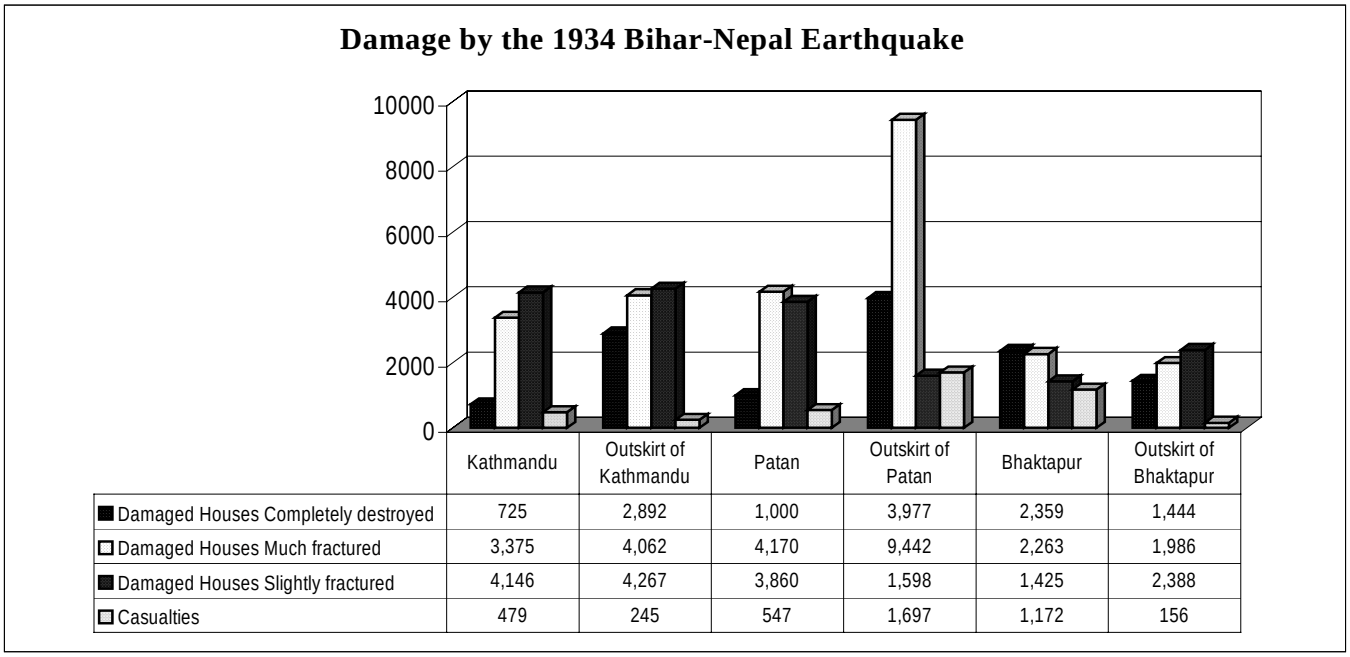
7.1.2. Fujiwara, et. al.; 1989. Reconnaissance Report

Table 46 : Damage of Buildings in Kathmandu Valley on 1934 Earthquake

Region	Destroyed Houses				Casualties
	Completely destroyed	Much fractured	Slightly fractured	Total	
Kathmandu	725	3735	4146	8606	479
Outskirt of Kathmandu	2892	4062	4267	11221	245
Patan	1000	4170	3860	9030	547
Outskirt of Patan	3977	9442	1598	15017	1697
Bhaktapur	2359	2263	1425	6047	1172
Outskirt of Bhaktapur	1444	1986	2388	5818	156
Total	**12397**	**25658**	**17684**	**55739**	**4296**

Table 47 : Loss of Life's in Kathmandu Valley on 1934 Earthquake

District	No. of Death		Total
	Male	Female	
Kathmandu	254	225	479
Outskirt of Kathmandu	79	166	245
Patan	250	279	547
Outskirt of Patan	871	3	0
Bhaktapur	433	739	1172
Outskirt of Bhaktapur	65	91	156
Total	**1952**	**2344**	**4296**



Earthquake of 1988:

- **Damage to Roads & Bridges:** There were two main roads in the earthquake stricken area in Nepal. They were:

1. Mahendra Rajmarg (East-West High Way)

   This road developed cracks at many locations. Some culverts and bridges were reported damaged. Gehari Bridge was severely damaged and a detour was made.

2. The Dharan- Dhankuta Road

   Bridges along this road were not damaged but this road was closed for several days because of landslides at several places.

- **Types of Construction and Suggestions for Improvement**

The earthquake of 21 August 1988 produced catastrophic seismic damage in areas of northern Bihar State, India and the southeastern zone of Nepal, even though, the intensity of the shaking was moderate. It has been suggested by Indian authorities that heavy rainfall prior to the shock, which produced great flooding, may have weakened the mud-stone and brick masonry buildings which showed the greatest damages.

The characteristic features of the typical types of construction found in the zones affected by the earthquake (listed below) may constitute the major reason for there having been catastrophic damage:

1. Heavy roofs or upper floor slabs constructed of a layer of bricks topped by a layer of mud.

2. Insufficient joint strength between the gable walls and such structural components as cross walls and wooden frameworks positioned perpendicular to those walls.

3. High rigidity of the unreinforced brick masonry or mud-stone construction, thereby producing an inferior ductility for lateral deformation.

4. Lack of stiffness in the framework of a building; in particular, in the floor slab. Therefore, an applied lateral force is not distributed properly to a stiffened frame that has a large resistance capacity.

5. Weak mortar composed of lean cement or mud-mortar used in the jointing of bricks and stones.

6. Lack of strength against lateral loading attributable to the inferior joint. mortar used in the construction of a building.

- **This report made the following recommendations.**

- Make buildings as light as possible. Use light materials such as wooden planks for floor slabs rather than bricks topped with a mud layer. Construct roofs or thatch or corrugated iron sheets instead of brick tiles cemented by a mud layer.

- Cramp the top of gable walls by using wooden or reinforced concrete roof bands, collar girders, or beams. It is advisable, and desirable, that gable walls and walls following the longitudinal axis of a building be fastened tightly together to form a rectangular wall box. A

number of cross walls constructed within such a box will greatly improve the seismic capacity of a building.

- Place columns and collar beams made of reinforced concrete appropriately, wherever possible. Such columns and beams will improve both the strength of a brick masonry wall, owing to their confinement, and the ductility of the frame.

- Place horizontal braces in the planes of roof and floor slabs, or use appropriate joints to stiffen floor slabs when adding wooden planks. Placement of wooden braces diagonally in corners is a feasible and easy method for stiffening a floor slab frame. When the frames of a building are stiffened, lateral forces applied to the entire structure can be carried adequately by individual frames in proportion to their seismic capabilities.

- Improve the quality of the cementing mortar used in order to produce high joint strength. Avoid the use of structurally weak mud-mortar. The strength of a brick masonry building is determined by the strength of its joints; the greater the strength or the mortar, the greater the strength of the building against lateral loading during shaking. The addition of a tensile-fiber material (such as jute) to mud and to cement improves the strength of these mortars; but, use of a rich cement mortar is strongly recommended for the greatest strength. Neither a lean mixture of inferior mortar nor lime mortar should be used to cement the joints between bricks.

- Placement of reinforced concrete collar columns and girders appropriately spaced is necessary to give high strength to filled-in brick masonry walls within the reinforced concrete frame. Such strong reinforced concrete frameworks also should provide ductility against lateral deformation such that there will be no sudden, brittle collapse of the building when its ultimate seismic resistance is reached.

- **Factors Related to Human loss & Emergency Responses**

-Age and gender

At 04:54 hours Nepalese local time when the 1988 earthquake struck, most people were home sleeping, except for a few villagers in remote hill areas. Of the 114 respondents to the intensity questionnaire 95% answered that they were indoors, and 5% outdoors. Only 3% answered that they were awake. This means that the initial conditions; i.e. the location of people and what they were doing was basically the same *regardless of age or sex.*

From August 25 to 29 the newspaper Rising Nepal listed the names, ages and gender of 628 earthquake victims, who accounted for 87% of the total fatalities in Nepal. The 52.7% for female fatalities is slightly higher than the percentage for males. Dividing these values by the percentages in the Population Census of 1981 gives a risk that is about 1.5% higher for females than for males.

The age distribution indicated that more than half of those killed were children under age 14.The higher risks seen for children and for the elderly among the adults agree with findings of other earthquake studies. A comparison between age groups and gender showed lower risk for males 30-39 years of age and those 60 and older. Because women of ages for motherhood have heavy family duties they may spend more time protecting children and therefore not be able to escape from collapsing houses. Also, elderly women may be physically weaker than males of the same age because of hard work during their youth and therefore have less chance of escape.

- Lethality of dwelling collapse

Ordinary dwellings in Nepal are mostly 2-storey brick, stone or adobe masonry buildings cemented with weak mud mortar and having framed roofs. Timber frame dwellings located near destroyed masonry buildings showed only slight damage.

In the old central wards where 2- and 3-storey brick and mud dwellings are the rule, building damage and loss of life were severe; whereas, in the peripheral, newly developed wards in which timber frame dwellings are common, damage was moderate.

Even in this small town, the input motion (seismic intensity) differed according to local soil conditions. The degree of dwelling damage categorised as complete became greater with increasing input motion and constituted a greater threat to life.

The type of serious damage done to dwellings blocked evacuation routes to streets and backyards, thereby increasing the risk of injury or death and debris from collapsed houses created hazards in outside areas. The high population density in this town was responsible for this situation.

- **Emergency Medical Responses**

Immediate Damage Assessment

The extent of earthquake damage must be evaluated quickly if there are to be quick responses that ensure rescue, medical aid, food and shelter. The official death tolls, revised daily, were reported in the Rising Nepal. Day 1 denotes 21 August when the earthquake took place. It took about 7 days in Nepal where 708 people were killed.

Fatality assessment was rapid in some districts but slow in others. Some surveys were finished on the 3rd day, others not until the 7th day.

Kosi Zonal Hospital

Kosi Zonal Hospital in Biratnagar is primitive by modern standards but is the largest health care facility in the Eastern Development Region of Nepal. Officially it has 100 beds, but in actuality there are 140 beds and 22 medical doctors. It admitted 560 patients after the earthquake. There were almost equal numbers of male and female patients. It was reported that the number of fatalities did not significantly differ for the two sexes. The injured males and females had comparable opportunities for treatment at the hospital as there were almost equal proportion of male and female patients in the hospital and fatality for two sexes too did not differ.

Almost half of the patients (45.7%) came from the Morang district in which the hospital is located although the 30 lives lost recorded for that district is a moderate figure (4% of the total for Nepal). The distance to Biratnagar from each stricken district was a major factor in determining the number of patients. Another important factor, naturally, was the number of human casualties in a district. It is difficult to determine what the complex effect of these two factors was because Sunsari and Dhankuta districts, which had the highest human loss, are relatively close to Biratnagar, Morang district.

The injured from nearby towns and villages came in during the first few days, but more than half of those treated arrived on the 6th day or later. This is because they had been referred from smaller district health centers or had been transported by helicopters from remote mountain villages. The Rising Nepal (Aug. 28) reported, "171 persons (31 from Khotang, 21 from Ilam, 24 from Udayapur, 36 from Panchthar, and 42 from Dhankuta) who were seriously wounded were airlifted to Kosi Zonal Hospital by helicopters of the Royal Nepal Army." The paper reported on Sep. 2, "The number of severely injured persons airlifted to Biratnagar had reached 276 till Wednesday (Aug. 31) evening."

Dharan Hospital

Dharan District Hospital (25 beds) with 2 doctors, 2 medical assistants, and 3 nurses is little more than a maternity unit and cottage hospital. The city of Dharan had a population of 118,218 and 20,000 households; 122 people were killed and 4,275 houses damaged (1,671 completely and 2,604 partially). The 2-storey house of the hospital superintendent was damaged beyond repair and the 1-story hospital ward had cracked walls.

Right after the earthquake, 1 local doctor and 1 medical assistant came in to help. Two hours later, 1 doctor and 2 medical practitioners, (1 from Indian Camp and 1 from Kathmandu) came in. Seven volunteers joined from the British Camp. Three medical students came from the Teaching Hospital in Kathmandu. The Rising Nepal (Aug. 24) reported "A six-member advance team of Health Professionals for Social Responsibility, Nepal, headed by an assistant lecturer of the Tribhuvan University, Institute of Medicine left for Dharan- Bijayapur, Biratnagar and Dhankuta to extend medical relief assistance. A Japanese team (1 surgeon, 1 paediatrician, 1 nurse) joined later.

Nineteen people were brought in dead. During the first 24 hours after the earthquake, 700 patients were recorded. In total 1,359 injury cases were recorded, of which 39 were admitted to indoor beds, 85 put into tents, 15 critical cases referred to Kosi Zonal Hospital and referred to the British Camp Hospital, The superintendent estimated that 800 additional patients who were given first aid were not recorded due to extreme confusion.

Dharan Hospital and the British Army Hospital had comparable numbers of patients, but the latter accepted more serious injuries. Not all the casualty cases were from Dharan itself, some were from other towns.

British Army Recruit Camp Hospital

The British Army Hospital in Dharan also played a very important role in treating earthquake injuries. The camp facilities, mostly single-storey, concrete block masonry buildings had moderate cracking. The water supply system (an 8-km pipeline from the hill) was damaged but repaired in a few days. Fortunately the sewage system was not damaged.

This Hospital normally has 72 beds, 4 doctors and a 105-member medical staff. Their emergency response has been well summarised by the British Gurkhas Headquarter, Nepal. Within 4 days, 250 emergency beds were added in tents with extra toilets and water supply. From UK-Hongkong Hospital, 2 doctors, 7 specialists and 57 nurses arrived to give assistance. The Rising Nepal (Aug. 25) reported, "A medical team comprised of 14 males and 5 females along with medicines arrived Kathmandu Wednesday (Aug. 24) by British Royal Air Force Hercules aircraft."

The Hospital erected a tented Casualty Clearing Station on the first day at the gate of the Camp, so that the flow of patients could be controlled. In all, this hospital took 884 injuries, of which 256 were hospitalised, 515 received treatment and were released, and 8 died. Also, 89 major and 223 minor operations were performed. The Rising Nepal (Aug.29) reported, "29 persons were airlifted to British-Gurkha Camp hospital of Dharan by Royal Nepal Army helicopters."

The first peak appears on the day of earthquake (Phase 1 - t*he mass casualty situation*) because of the immediate inflow of casualties from the town of Dharan. It took several days for the second peak representing patients arriving from the hill areas (Phase 2- *Consolidation*: Days 1 to 5). Movement of casualties was hampered by landslides on the 52-km Dharan to Dhankuta road, and helicopters had to be called in. There was a similar situation at Kosi Zonal Hospital. During Phase 3 (*Expansion*: Days 6 to 24) 117 beds were occupied at the peak. It took about 12 days before the treatment or admission of new patients ended. Phase 4 (Rehabilitation/ Discharge) started on day 24 when the reinforcement team returned to Hong Kong.

Earthquake-related Articles in Newspapers

The release of earthquake news in newspapers reveals the social, political and economic impact of the disaster in the society or the country. Timely release of information through the mass media on the extent of damage and need for public assistance helps those who are able to and interested in helping the victims. There was a large coverage of the earthquake news in this paper as records showed that onn Day 1, when the earthquake took place, the Nepalese paper published 261 articles.

- **Conclusion**

Age and gender of an occupant influenced the risk of fatality and it was consistent with other studies; that is, children and the elderly tend to be the victims of an earthquake. Mud-stone or brick masonry dwelling common to the damaged region of Eastern Nepal were much more vulnerable to earthquake motion than were buildings in Japan. The lethality of dwelling collapse (risk to occupants of a collapsed building of being killed), however, varied from 1 %, (comparable to that for Japanese wooden dwellings) to 6%, (comparable to the value for Italian stone masonry dwellings). These results provide a basis for estimating the possible extent of human casualties in a future earthquake and for providing better disaster mitigation measures.

The emergency responses of hospitals, and earthquake-related newspaper reports were investigated to determine how public and private organisations responded to the emergency caused by this earthquake. Disrupted communication and road networks were the major obstacles to a quick assessment of damage, to movement of the injured, and to transportation of relief materials. There were, however, great efforts made for the relief of the victims within the very limited resources available although there were a number of disputes about justice and equal treatment in the relief actions.

7.1.3. Gupta, Satyendra P. 1989. Eastern Nepal Earthquake 21 August, 1988

- **Relief and Rehabilitation**

Response to the earthquake was immediate. Nepal has central Disaster Relief Committee under the chairmanship of Minister for Home. The Committee took charge of the rescue and relief operations. The committee met regularly and took decisions for the rescue and relief work for the earthquake victims. Some of the important measures taken are as follows.

1. Rescue Phase (to continue for few weeks)

    a. Rescuing all people buried under debris and transporting the injured to hospital.

    b. Airlifting seriously injured persons to the equipped hospitals from remote places (hilly and inaccessible areas) to Biratnagar and Kathmandu. (accordingly more than 300 seriously injured people were air lifted from remote villages to the equipped hospitals under operation named "Operation Swift".)

    c. Provision of free medical treatment to all earthquake victims.

    d. Rescuing lives and properties from the endangered houses to safer places and providing them with temporary shelters.

Further decision was taken that the relief work would continue for one month only.

2. Relief Phase

a. Provision of financial assistance to the earthquake victims - Rs. 2,000 per dead person - Rs. 1,000 per house either collapsed or inhabitable

b. Provision of 40 kg of food grains (rice) per family and distributing the same to the needy victims.

c. Provision of plastic sheeting to the homeless.

d. Requesting social service organizations and NGOs for assistance in the relief operations (Nepal Red Cross Society responded accordingly. Social Services National Coordination Council dispatched relief supplies to the needy victims).

e. Channeling all relief supplies and assistance through District Relief Committee (a permanent body under the chairmanship of District Panchayat Chairman) to ensure proper coordination and distribution.

f. Establishing new bodies at the regional levels to ensure practical coordination, especially in the light of logistics and the extent and magnitude of the damage. (These committees were named as Relief Works Coordination Committees and were formed under the chairmanship of Assistant Ministers. One of these committees was stationed at Biratnagar and the other at Kathmandu). The committee at Biratnagar was located in the Biratnagar Airport complex and the Assistant Minister camped there for more than a month to see the overall relief work operations.

g. Forming seven sub committees within the Central Disaster Relief Committees (Security, Aid Coordination, Health, Supplies, Relief Supply Dispatch, Communications and Rehabilitation and Reconstruction Sub- Committees).

3. Rehabilitation Phase (after one month)

a. Provision of loan assistance for private house construction up to Rs. 50,000 with interest holidays.

b. Provision of technical and construction materials input at the village level.

c. Constructing low-cost earthquake resistant houses for demonstrations.

d. Encouragement for adoption of earthquake resistant designs.

e. Formation of a Central Earthquake Reconstruction and Rehabilitation Committee under the chairmanship of Minister for Housing and Physical Planning.

f. Utilization of three per cent of project budget as contingency for reconstruction.

All of the above steps were endorsed by His Majesty's Government of Nepal who mobilized all material and financial resources for the rescue and relief operations.

Further in an effort to channel valuable assistance from individuals, institutions, foreign countries and international organizations, His Majesty's Government of Nepal established a Central Earthquake Relief and Rehabilitation Fund under the chairmanship of the Prime Minister. This fund received encouraging support from various sources from within the country and abroad. A sum of Rs. 102.30 million had been collected with contributions from local population and organizations amounting Rs. 36.83 million, from foreign countries including organizations Rs. 24.37 million and contributions from HMG in cash assistance Rs. 41.10 million to date.

Besides, a few foreign government and international agencies provided material assistance of relief supplies worth over Rs. 28.0 million. The list of governments providing relief supplies include Japan, USA, Bangladesh, Singapore, India, Israel, USSR, U.K. and Saudi Arabia. Assistance in kind were also received from UNICEF, WHO and various countrywide organizations like the Red Cross.

All the cash and kind contributions were received by the Central Relief Committee or by the Central Relief and Rehabilitation fund. The assistance to the earthquake victims were channeled through the Relief Supply Dispatch Sub-Committee to the regional Relief works committees, which in turn channeled Relief Committees dispatched various teams to the affected areas and distributed assistance to the victims on the basis of damage data collected locally.

NGOs and other voluntary organizations also channeled their support to the victims through the same process and distributed to the needy in coordination with the district committees.

Transport facilities like helicopters, skyvans and Avros available at the disposal of Royal Nepalese Army and Twin Otter planes available with Royal Nepal Airlines Corporation (RNAC) and UNDP/ Nepal were utilized for the rescue and relief operations mainly for airlifting the injured and for airdropping of the relief supplies to the remote districts and villages on the hills.

His Majesty's the King of Nepal also responded immediately. His Majesty sent a message of condolence to the ravaged families and directed His Majesty's Government to launch rescue and relief operations to the fullest possible efforts. Towards the end of the rescue and relief phase, His Majesty the King accompanied by the queen visited the earthquake affected areas and himself inquired upon the rescue and relief operations launched by the Government. After the visit, His Majesty's directed encouraging and inspiring measures to the government, which also responded immediately and took a series of steps to implement the same.

During the entire operation, Disaster Relief Section in the Ministry of Home and Disaster Control room in the police headquarters did a tremendous job for which they had no previous experience of such magnitude. Royal Nepal Army, doctors, political and social workers also outdid the part performance in pursuing their goals of realizing relief to the victims.

The UNDRO also responded immediately and appropriately in this phase. Following an appeal by UNDRO, its members directed cash and kind assistance for the earthquake victims proving it to be valuable. Local UNDP also responded and arranged several aid coordination meetings and also briefed the resident international donor agencies in Kathmandu for obtaining support to the earthquake victims.

The relief phase was officially closed exactly after one month of the earthquake and 21 September 1988 was declared as National Mourning day in memory of the earthquake victims.

His Majesty gave several directives for rehabilitation of earthquake victims and some of them are listed here.

If the earthquake-affected families whose houses have collapsed or rendered uninhabitable seek loan for building of their houses, they should be provided loan up to five thousand rupees and made available at a reasonably concessional interest rate.

The direction was given to the government to provide loan facility at concessional interest rate through the Agricultural Development Bank to those families whose livestock had perished in the quake and need loans to buy livestock.

The landowners whose houses had collapsed or rendered uninhabitable should be exempted from land tax for the fiscal year 1988-89.

Further a study be made of the condition of Dharan town area and introduce a town project for reconstruction of the town in a planned way. Recognition has been given to the services rendered to the earthquake victims through the various social organisations and a grant of ten million rupees has been provided to the welfare fund of the Social Services National Co-ordination Council to enable it to cope with natural calamities that may occur in future. Funds may be made available for necessary repairs and reconstruction of HMG projects like suspension bridge, drinking water, electricity, irrigation and other public utilities damaged by earthquake. The work should be undertaken as soon as possible for formulating a time bound programme. Similarly units concerned are to formulate a plan and repair or reconstruct health posts, health centres and district hospitals damaged by earthquakes as soon as possible.

- **Difficulties Encountered**

In spite of the success achieved, the rescue and relief phase of the post earthquake operation was not without problems. In fact the relief and rescue personnel and the government had to face a number of problems and uncertainties. Some are listed below.

i) Inaccessibility to the rural villages due to their location on the mountains.

ii) Shortage of aircraft and bad weather for several days after the earthquake.

iii) Shortage of communication equipment.

iv) Lack of training in disaster management for the officials as well as local relief workers.

v) Shortage of ambulances and mobile hospitals.

vi) Absence of relief stockpiles and shortage as well as transportation problems of relief supplies.

vii) Non-availability of relief materials like plastic sheets in the local market.

viii) Lack of format in damage data collection.

ix) Some coordination problems with NGOs and voluntary organizations.

x) Problems of public relation and media.

- **Rehabilitation of Earthquake Affected Schools**

Details given below show a consolidated number of schools which had been affected during this earthquake in the eastern and central zone. Details about the money needed for the rehabilitation of these schools have been prepared by the Department of Education and a cost- estimates is given below.

A.	Schools (Primary, Lower Secondary and Secondary)	No. of School Affected	Estimated Damage (Rs. X 1000)
	Eastern Zone	958	58,380.00
	Central Zone	246	19,920.00
			78,300.00
B.	Higher Ecudation	No. of Campus	
	Eastern Zone	11	5,527.00
	Central Zone	4	650.00
			6,177.00
C.	Trade Schools	No. of Schools	
	Eastern Zone	3	8,800.00
		Total	**93,277.00**
		Grand Total	**93,277,000.00**

- **Proposed Plan for Rehabilitation of Affected Schools**

The schools have been divided into three categories according to the degree of damages as (A) fully damaged, (B) partially damaged and (C) those which need minor repairs. These damages include buildings, furniture, education materials and equipment.

UNESCO had a plan to a grant of US$ 100,000 which would be distributed to the earthquake affected school managing committees to purchase construction materials, education materials as well as equipment all of which could be procured locally. Because of large number of schools being affected and almost half a million students who studied in these schools and their studies being disrupted there is a need for assistance both in cash and kind for the immediate and proper rehabilitation of these schools.

It was proposed that all assistance for the rehabilitation of these schools may be channeled through the District Level Rehabilitation Committee. The District Rehabilitation Committee (DRC) after ascertaining the extent of the damage to schools may adopt one of the following standard to provide assistance to the concerned school managing committee.

A. Secondary Schools (Class 1 to 10):

a.	Fully damaged, a lump sum grant of	Rs.	250,000
b.	Half or nearly half damaged, a lump sum grant of	Rs.	125,000
c.	Needing Minor repairs, a lump sum grant of	Rs.	65,000

B. Lower Secondary Schools (Class 1 to 7)

a.	Fully damaged, a lump sum grant of	Rs.	100,000
b.	Half or nearly half damaged, a lump sum grant of	Rs.	50,000
c.	Needing Minor repairs, a lump sum grant of	Rs.	25,000

C. Primary Schools (Class 1 to 5)

a.	Fully damaged, a lump sum grant of	Rs.	80,000
b.	Half or nearly half damaged, a lump sum grant of	Rs.	40,000
c.	Needing Minor repairs, a lump sum grant of	Rs.	20,000

It was also proposed that grants made available for rehabilitation works would be closely supervised by the DRC and will be duly audited.

The other standard that could be used for providing assistance would be on the basis of cost-estimates of actual rehabilitation works of the school buildings to be done by the DRC. In such a case about 75 per cent of actual rehabilitation cost may be borne by the DRC, and again through the school managing committees. The payment should be made in three installments following reports of completion of three different stages of rehabilitation works.

7.1.4. Niranjan Thapa, 1989. Earthquake of 1988 (in Nepali)

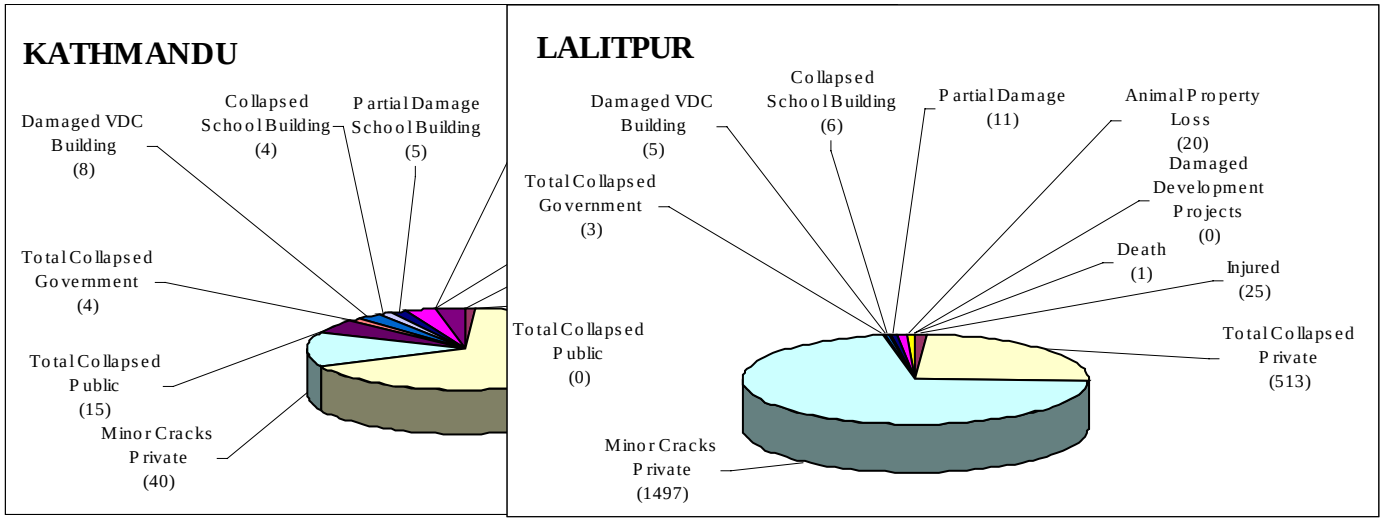
Following loss chart (Table 48) is provided in the above document.

Table 48 : 1988 Udayapur Earthquake

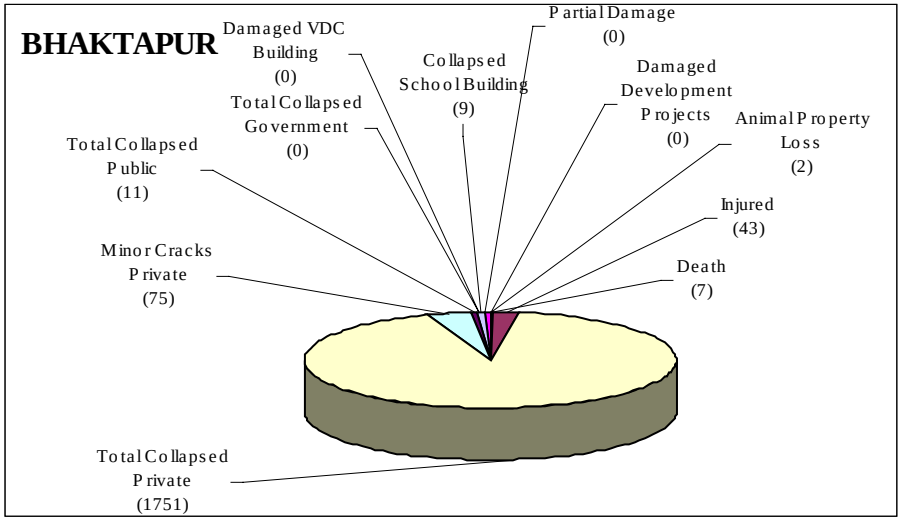
Loss Chart

S. N.	District	Death	Injured Nos.			Building Damaged										Damaged VDC Building	School Building			Animal Property Loss	Damaged Develop-ment Projects
						Private				Public			Government								
			Seriously	Minor	Total	Total Collapsed	Damaged Inhabitable	Total	Minor Cracks	Total Collapsed	Damaged Inhabitable	Total	Total Collapsed	Damaged Inhabitable	Total		Collapsed	Partial Damage	Total		
1	Kathmandu	0	0	3	3	0	200	200	40	0	15	15	0	4	4	8	4	5	9	0	0
2	Lalitpur	1	3	22	25	376	137	513	1497	0	0	0	0	3	3	5	6	11	17	20	0
3	Bhaktapur	7	23	20	43	274	1477	1751	75	0	11	11	0	0	0	0	9	0	9	2	0
	Total in KV	8	26	45	71	650	1814	2464	1612	0	26	26	0	7	7	13	19	16	35	22	0
	Total in Country	721	1657	4896	6553	21976	42198	64174	13959	150	318	469	223	567	790	159	346	604	950	1566	2008

Total Loss Value Rs. 5,000 million


KATHMANDU
Damaged VDC Building (8)
Collapsed School Building (4)
Partial Damage School Building (5)
Total Collapsed Government (4)
Total Collapsed Public (15)
Minor Cracks Private (40)

LALITPUR
Damaged VDC Building (5)
Collapsed School Building (6)
Partial Damage (11)
Animal Property Loss (20)
Damaged Development Projects (0)
Death (1)
Injured (25)
Total Collapsed Government (3)
Total Collapsed Public (0)
Total Collapsed Private (513)
Minor Cracks Private (1497)


BHAKTAPUR
Damaged VDC Building (0)
Partial Damage (0)
Collapsed School Building (9)
Damaged Development Projects (0)
Total Collapsed Government (0)
Animal Property Loss (2)
Total Collapsed Public (11)
Injured (43)
Minor Cracks Private (75)
Death (7)
Total Collapsed Private (1751)

7.1.5. Report on Flood Rehabilitation & Management Program, Flood Reconnaissance Team, February, 1994

Similarly, flood and landslides are other natural disasters that Nepal often faces. The heavy rainfall on the 19th & 20th July 1993 floods caused widespread damage, heavy loss of human and animals lives, disruption in economic and developmental activities and panic in the society throughout the Mahabharat Range and the adjoining Tarai areas. Severe damages were caused to roads, irrigation works, hydroelectric installations and other physical infrastructures. The damage to communities was severe. About 500 thousand people were affected from the damage to houses, cattle sheds, rural infrastructures, buried farmland and disconnected rural roads. Nearly 1400 persons died. Such disrupted communities are still in a precarious situation because they continue to be vulnerable to future disasters, since unstable debris remaining along river courses and hill slopes may easily collapse and flow down if triggered by even a small storm.

Urgent remedial measures to the damaged infrastructures were carried out and major infrastructures such as the Kulekhani Hydropower Station and Tribhuvan and Prithivi Highways were rehabilitated. However, there were still many other remedial measures to be taken in order to mitigate damage which might be caused by similar natural phenomena in the future.

Summary of Damage

Persons dead & missing	1,475 Persons
Families affected	84,150 families
Population affected	481,844 persons
Houses damaged	39,694
Public buildings damaged	633
Crop loss	55,945 ha.
Livestock loss	25,388 heads
Roads	367 km
Bridges	277
Irrigation facilities	67

7.1.6. Oi, Hidetomi and et. al 1995; Suffering of people and problems of communities in the aftermath of Disaster of 1993

A quick survey (interviews with victims of 1993 flood disaster) was conducted during April to May and September to October 1995 about two years after disaster in Sarlahi, Makwanpur and Chitwan districts. This has been recorded in the book mentioned above written by Oi, Hidetomi et. al.

Among the victims, most of them were children, women & the old persons. The flood swept away their homes together with the families. Among the survivors, mostly they took shelter in houses built in higher alleviation and school buildings.

Army Helicopters were helpful in airlifting the survivors to safer places. They were also provided with some rice and/ or beaten rice for few weeks.

A total of NR. 215.5 million assistance was provided to the victims for rehabilitation (house construction) by the Tzu Chi Foundation. This grant assistance was used for the construction of houses. Redd Barna too helped in constructing 55 houses in Chitwan.

- Assistance from Tzu- Chi Foundation, Taiwan

District	Village	No. of Houses
Sarlahi	Sukhiapokhari	500
Makwanpur	Padampokhari	400
Rautahat	Santapur	600
	Parauhi	300
		1800 Houses

- Assistance from Red Barna

Chitwan 55 Houses

- Under the Phedigaon Flood Relief Program of Bagmati Watershed Project, a grant assistance equivalent to NR. 1.8 mil was used to construct 400 houses in Padampokhari in Makwanpur using donations from voluntary groups of Germany & Japan.

  Survivors of Chitwan & Sarlahi reported that many more casualties would have been minimized had there been a better information management system. Heavy rain in upstream was not broadcasted well and people in the downstream (Sarlahi, Rautahat & Chitwan) were not alerted by Radio Nepal which played only agony music till 11 PM.

Mr. Hidetomi's book brings to us with vividness the personal tragedies that the disaster of 1993 brought about to many people living in the central and southern part of Nepal.

Summary of suffering:

Name	Description	Suffering
SARLAHI DISTRICT 1. Nara Maya Lopchan	She lived with her husband, two children and parents. On that night her husband had gone to look at the roaring river while she and her father carried her children on the head as the flood water had already entered into the house.	Her thatched house was washed away. First they moved to a shelter, then to their acquaintance and finally in a house constructed for the victims. They were partially supported by the government for 2 months for food while her breast milk stopped and she feared that her baby would die. Her other kids often stole maize grains due to hunger which embarrassed her. Often she thought they were going to die. *She said she was waiting to die as dying was easier than to live with such hardship.*
2. Ek Bahadur Gurung	Ek Bahadur was a tenant to his relative in Gorkha district ; when the relative moved to this place Nar Bahadur too migrated. He slept with his family as usual on that night. He felt wet while sleeping and suddenly found that the flood water had already entered his house	He hastily woke up the children and climbed up the roof. It was not safe so they again moved to the embankment while he saw villagers being flown away by the flood. Next day he found everything swept away from his house by the flood. He did not get any food for three days and on the fourth day an army helicopter distributed some beaten rice (*Chiura*). Government had declared to give Rs 500 each to the victims but he never received any money. He said there was *"no plan, and no hope for the future"*.
3. Denka Raya	He barely rented a room in Bharatpur and became a landless rickshaw puller after his land in Sarlahi was washed away by the flood.	After he lost land Denka became a daily- wage farm labor and his wife took care of buffalo. However, this was not enough and they went on selling buffalo one by one till he had to migrate to Bharatpur to become a rickshaw puller. He had rented that rickshaw at Rs30 a day.
4. Shanti Devi Paswan	Shanti's house was made of thatch and mud and it got washed away by the flood with all of their belongings. She belonged to a low caste and almost used to be excluded from several activities.	Relief goods were distributed after eight days but no body informed her that she could also be eligible to get some assistance. Following others she also stood in line but when her turn came she was not given any food stuff. *Had their relatives from India not come for assistance she would be dead.*
MAKWANPUR DISTRICT	Shankar and his brother grew vegetables and on that day also they were up on the farm when rain was very wild from 3 PM itself. They	Shankar found 5 children and parents got burried in debris and died and two were rescued. His brothers' wife had a trauma and lost her memory permanently. Even the surviving son often cries out of fear uttering, *" I am going to be swept away by flood"*

6. Shankar Basnet	could see their houses on the foot hills and as there was continuous land slide they could not go to their homes and they even saw their homes flown away together with the debris.	
7. Man Bahadur Bamjan	He was a retired policeman living with his wife.	The river swelled and the whole village was submerged. The villagers managed to rescue on a high land and next morning army helicopter lifted them to a school for temporary shelter. They were driven out from the school also after few days and Man Bahadur had to live in the forest land with few other families along the river. Inspite of government's announcement of compensating Rs 4,500per Kattha land lost, Man Bahadur did not get any money while he was expecting to get Rs 15,000.00. He was told that he should continue paying land tax to the government and the moment he stops paying may be he will not be given any compensation.
8. Masina Paudel	She was relatively well to do during that time with a three storied house and 15 ropanis of land with a gross income of nearly Rs 60,000.00 per year. She also had a tea shop.	Masina was preparing dinner on the third floor when she found her husband's brother shouting that there was a big flood and we must run immediately. She rushed to a house at higher elevation with all her children. She was informed that around 10 PM her house was also swept away together with other 5 houses. Next morning she found that everything was washed away but all the children were safe. The relief goods were of a very low quality and those who were distributing were arrogant. She borrowed loan from various private sources and constructed the house but she had a feeling that her land could not be reclaimed and it was much wiser to buy a new piece of land than reclaiming. Masina's husband was in prison in Hetauda during the flood and when he was discharged, he got depressed with the loss of house and land and became drug (alcohol) addict.
9. Omkar Bahadur Baral	Omkar had a good house and a shop and he was earning income, which was sufficient for his family.	But in that particular night flood washed away 32 houses from the Bazaar and Omkar's house was one of them. He expressed, *" I felt as if my life had come to an end"*. However after few months the Bagmati Watershed Project (BWP) decided to help the victims and land entitlement was given to the victims. Omkar had to raise his children but felt as if it was the start of his life again from the very beginning.
CHITWAN DISTRICT	Tilak lived with his wife and an orphan grand daughter. He was also	Tilak began living in a temple in the village and became the priest. He survived by selling milk. *The flood still remains an unhealed wound in the minds of the*

10. Tilak Bahadur Khatri	running a tea stall and a grocery shop for some supplementary income. His family had three houses and 0.8 Ha of farm land. By the flood he lost everything. GTZ working in that area distributed cows to the 30 affected families and Tilak also got one cow.	*villagers.* It is reported that they rush to the hill behind the East West High way whenever they see cloudy sky over the river. They are also scared of the newly built government assisted irrigation scheme which passes through the village. They fear that during heavy rain, water table of the river could rise, which could damage the scheme and sweep away the village in no time. *Tilak Bahadur carries the feeling that the day when the wound in the hearts of villagers heals may never come as far as this type of episode persists.*
11. Lok Raj Silwal	Lok Raj was originally from a hilly district, Dhading and he migrated to Chitwan with his mother when he was a boy in search of better future. In 30 years time he had added 1.8 Ha. of land and five children, two were going to the university. He had a two storied Pukka (made of brick and cement mortar) house. He had earned a good social status too in the village.	Night before it had rained cats and dogs but on the night of the big flood, it had not rained much but suddenly villagers began crying and when Lok Raj saw outside the river had already started devastating the village. It was so abrupt and unexpected that any decision was difficult but all of the family members went to the second floor. On the ground floor, it was filled with flood water and in minutes all food grains, furniture and everything was washed away or buried in the sand and mud. Half of his farm land was also completely destroyed. *Radio Nepal was playing sad songs but did never warn the residents in that night otherwise rescue measures would have been more efficient. After two years of this disaster too only nearly 3% of the damaged farm land of the village have been rehabilitated. Houses that were damaged, farm lands that were buried with sand and many more are left desolate.*
12. Juddha Bahadur Sunar	He was living in his house with his family when the flood came. His neighbor's house was safer as there was a green fence of *sisso* trees. They are tall and strong.	He took all of his family members one by one to his neighbor's roof top and he himself climbed up the tree *but half of his body was submerged in water and he thought that this was the end of his life*. He worried about his children after his death. Water was rising and houses began sinking. So he managed to swim to the roof and hold the smallest child and his own mother whom he wanted to take to a much higher place. But all of a sudden a swift current swept away his mother and he could protect his son only. He swam back and rescued the other children. Next morning army helicopter came and airlifted them to a safer place (evacuation camp). Within minutes Juddha Bahadur lost everything including his 16 *Kattha* of farm land (nearly half hectare) and became a farm labor

7.2. Expressions from the Focus Group Meetings

Baneswore, Ward No. 34, KMC:

A focus group meeting was held at the NSET office in Ward No. 34 of Baneswore on April 7, 2001 at 8 AM. This was organized by the Disaster Management Committee, Ward No. 34. This non-governmental organization aims at making Ward No. 34 as a model Ward from Disaster Mitigation point of view. The meeting aimed at gathering data on risk perception i.e., whether or not the participants see the likeliness of any earthquake in Kathmandu in the near future & if so why do they perceive so? b) preparedness i.e., did they think they are prepared to face such disaster, what would they do if disaster occurs; any common property, open space, public buildings, school clubs etc. which could be of use to the affected households during evacuation, what do they think about getting the community organized to face such disaster, c) any existing formal or informal organization(s) which may be available for help in disaster?, and any experience to share about the 1934 and/ or 1988 earthquakes and post earthquake feelings. The meeting took up a participatory approach and each participant expressed his/ her opinion on the above mentioned aspects. There were altogether 22 participants and 16 of them participated in the discussion for 2 hours. The whole proceeding was video taped by NSET. Following are some of the key points, which were discussed at greater length.

Most of the persons were highly sensitized and thought that a great earthquake was due anytime in the valley. They have been hearing about this thing and they also knew that these information must be disseminated up-to the community level.

About preparedness, nobody thought they were prepared to face such disaster. They thought there is no systematic inventory of facilities/ resources, which could be used in need. There was no preparation for the pre-earthquake, during the earthquake & post earthquake periods. Some of the suggested activities were to organize & train volunteers in each locality & Ward, implementation of building code, resource generation, resource mapping, widening of streets and the likes. They also suggested that open spaces & school compounds should be noted and made ready in the time of rescue. About organizations for future use, the participants suggested that the Ward 34 DMC should take a lead in making an inventory of all clubs, Trust, NGOs & other local community based organizations. There were sport club, a religious *guthi*, sewage disposal club, high school, NGOs & Girls Care Centre, which were also represented in the meeting. All expressed their willingness to cooperate and even donate some money to the Ward 34 DMC.

When asked if they had any feelings to share about 1988 earthquake, nobody had anything in particular. At the end, they appreciated the initiative taken by Ward 34 DMC and requested NSET for providing retrofitting service to few initiators & also conduct several meetings to various stakeholders at different levels in order to disseminate earthquake information & sensitize the issue. Kailash Pyakuryal facilitated the discussion.

Summary of Focus Group Meeting/ Community Meeting, Baneswor, KMC

• Date/ Time	April 7. 2001, 8 - 10 AM
• Place	Ward No. 34 KMC
• Participants	22 persons, all residents of Ward No. 34, occupying various positions, such as community/ political leaders, former diplomats, members of Ward No. 34 Disaster Management Committee, social workers, engineers, doctors & teachers.
• Topics of Discussion	■ Risk Perception ■ Preparedness ■ Prior Earthquake Experience
• Output of Discussion	■ <u>Risk Perception</u> (i) All were very sensitive to future great earthquake any time in Kathmandu valley (ii) Participants have expressed their desire to retrofit their buildings & were willing to donate Rs. 1,000 each to the Ward No. 34, Disaster Management Committee (DMC). (iii)Suggested the DMC to undertake information dissemination activities in a larger scale
	■ <u>Preparedness</u> (i) Nobody thinks either the government or any other agency is prepared and capable of rescue operations (ii) They suggested that volunteers from local clubs & students from schools should be given sufficient training for rescue operations. (iii)Since there were couple of clubs such as sports club, Panchakumari Guthi, sewage disposal club, girls care centre and the likes, it was recommended that a complete inventory should be made including open space with them for future use (iv)Suggestion was made to update the inventory of all buildings with improved location map. This would facilitate future planning.
	■ <u>Any prior Earthquake Experience</u> None of the participants except one could recollect any prior earthquake experience. Narrating the experience of 1988 earthquake one of the participants said, after the early morning earthquake, there was a panic. All neighbors ran out of bed till it was dawn. Even then there was a great terror in mind fearing that there could be a return earthquake anytime. This condition remained for months.

Ward 34 Disaster Management Committee (DMC), KMC

Organization: The DMC was formed in the year 1998. It has a committee of 15 members and the Ward Chair is the ex-officio chair of the DMC. All ward members are also ex-officio members. Schools, NGOs, ward- level police office, women, intellectuals, industrialists, disaster management technicians, and the youths also represent the committee. Besides this committee, it has a council of advisory council representing various walks of life that frequently meet and give advises to the DMC.

Objectives: Following are the main objectives of the DMC.

- Initiate campaign for mass awareness in order to reduce risk of ward level disaster,
- Help related organizations on disaster management according to HMG policies,
- Develop map of the ward showing disaster risk and resources (open space, water etc.),
- Prepare volunteers to work for rescue operations,
- Mobilize internal and international resources for reducing disaster, and
- Prepare for risk prevention and prepare long term disaster management plan for the ward, and get it discussed, approved and implemented.

Activities: Following activities were conducted by the DMC in the last six months.

Partnership: Partnership was signed with two local NGOs on November 13, 2000. These NGOs are assisting DMC in filling up the survey forms. These forms include information regarding risks and resources in relation to disaster management.

*Disaster Awareness Sessions among School Student*s: The DMC organised disaster awareness sessions in the following schools.

Name of the School	Ward Number	Date
N.K. Singh Memorial EPS	34	December 4, 2000
N.K.Singh Memorial EPS	34	December 6, 2000
Reliance English School	34	January 31, 2001
Lotus Eyes Tiny Toys School	34	February 9, 2001
Gyan Niketan Secondary School	34	February 16, 2001

Besides the awareness sessions, video clippings of 1993 flood disaster, information regarding the 1934 great earthquake and scenario of Kathmandu if similar earthquake occurred in the future were also shown. Each session ran for two hours.

Survey: A basic survey is underway. Till now 500 survey forms have been filled. The information collected mainly consist of socio-economic data, disaster risk and disaster preparedness as well as resources at hand so as to prepare disaster management plan.

Resource Mobilization: A 3-year plan was submitted to the National Society for Earthquake Technology (NSET)- Nepal on April 28, 2000. In principle, NSET has agreed to assist the DMC for this period and has provided a small grant to run various activities mentioned above. Since DMC is a voluntary organization, it would be seeking grants for sustenance. The DMC advisors have also promised to voluntarily contribute some money to it.

Activities in the Past: A one week (July 28-August 2 1999) training workshop was organized by the DMC in association with United Mission to Nepal (UMN), NSET, Lutheran World Foundation Nepal & the KMC. It was the third in series.

First Workshop	7-10 May 1998	Lalitpur, Ward No. 10
Second Workshop	11-16 August 1998	KMC, Ward No. 34
Third Workshop	28 July-2 August 1999	Babar Mahal, KTM

In the third workshop 25 persons participated and they were 3 female ward members, 3 KMC staff, 9 INGO/CBO/NGO personnel, 2 police officers, 2 school teachers, 1 student (Master Level Engineering) and 5 government officers. Minister of Science & Technology was the chief guest. The workshop training focused on types of disasters, preparedness, and disaster management. A training schedule follows: (Training Schedule 1).

Training Schedule 1

134 Ward Disaster Management Committee, KMC

Community Disaster Management Training cum Workshop

Shrawan 12-16, 2058 (July 28-August 2, 1999) Bagmati Watershed Management Project Hall, Kathmandu, Nepal

Organized in association with UMN, NSET-Nepal, LWF & KMC

COURSE SCHEDULE

Time/ Date	Shrawan 12, 2056 July 28, 1999 Wednesday	Shrawan 13, 2056 July 29, 1999 Thursday	Shrawan 14, 2056 July 30, 1999 Friday		Shrawan 16, 2056 August 1, 1999 Sunday	Shrawan 17, 2056 August 2, 1999 Monday
	DAY 1	DAY 2	DAY 3		DAY 4	DAY 5
10:00-10:15	Registration	Review	Review		Review	Review
10:15-11:15	Welcome Introduction of the Participants Objectives of the Course	Environmental impact in Urban Communities Ministry of Polulation & Environment	Rescue Operation By DSP Kamal S. Bom		First Aid By Nepal Redcross By .... Thulung	Simulation Exercise on Community Disaster Management
11:15-11:30	TEA	TEA	TEA		TEA	TEA
11:30-12:30	Introduction to disaster Disaster Management By Mahesh Nakarmi	Epedemic Diseases By Dr. Kokila Vaidya	Relief Operation By		Community Mass Casualty Management By Mahesh Nakarmi	Simulation Exercise on Community Disaster Management
12:30-13:00 13:00-14:00	Disaster Management, Disaster & Development By Mahesh Nakarmi	Earthquake By Mahesh Nakarmi	Street Drama National Disaster Management Policy By Dr. Meen. B. Poudyal		Video Mexico Excersise-Demonstration	
14:00-14:45	KHAZA	KHAZA	KHAZA		KHAZA	KHAZA
14:45-15:45	Disaster Mitigation & Disaster Preparedness By Mahesh Nakarmi	Video on Natural Hazards	Local Level Disaster Management By Mahesh Nakarmi		Community Based Disaster Preparedness By Bimala Rijal	Group Work Action Plan Workshop
15:45-16:00	TEA	TEA	TEA		TEA	TEA
16:00-17:00	Fire By Murari Binod Pokhrel	Video on Natural Hazards and Discussion	Excersise-Class Room		Building Construction and Building Code By Yogeshwor Krishna Parajuli	Closing Ceremony

Another one week workshop was held during November 29 to December 3, 1999 in Ward No. 14 of KMC. This workshop was supported by Ward 34 DMC which provided resource persons. Twenty three persons participated and they were 11 Ward Member from 5, 14, 31, 33 & 34; 3 students, 1 police officer, 2 persons from the gas station and 2 from the local clubs. The workshop was inaugurated by the chairman of Ward 34 and Mayor of KMC was the Chief Guest.

The objectives of these workshop training were to clarify the concept of disaster & its management, improve the capacity of local people for rescue, resource mobilization & preparedness for disaster management & motivate them to form disaster management institutions. The training schedule follows (Training Schedule 2).

Training Schedule 2

Disaster Management Committee

Ward No. 14, Kathmandu Metropolitan City

Community Disaster Management Training cum Workshop

Supported by DMC, Ward No. 34

Date: Marga 13-17, 2056 (Nov. 29- Dec. 3, 1999)
Venue: Nepal Red Cross Society, Kalimati

Time/ Date	Marga 13, 2056 Nov. 29, 1999 Monday	Marga 14, 2056 Nov. 30, 1999 Tuesday	Marga 15, 2056 Dec. 1, 1999 Wednesday	Marga 16, 2056 Dec. 2, 1999 Thursday	Marga 17, 2056 Dec. 3, 1999 Friday
	DAY 1	**DAY 2**	**DAY 3**	**DAY 4**	**DAY 4**
09:30-09:45	**Registration**	**Review**	**Review**	**Review**	**Review**
09:45-10:45	Welcome Introduction of the Participants Objective of the Course	Fire (MBP)	Disaster Response by Royal Nepal Army	Building Consturction and Buklding Dode (JBK)	National Disaster Management Policy (MBP)
10:45-11:00	**TEA**	**TEA**	**TEA**	**TEA**	**TEA**
11:00-12:00	Introduction to Disaster	Earthquake (MN)	Community Based Disaster Preparedness (BR)	Simulation Exercise on Community Disaster Management	Group Work Action Plan Workshop
12:00-13:00	Disaster Management, Disaster & Development	Epidemic Diseases (KDS)	First Aid (NRCS)		Group Work Action Plan Workshop
13:00-13:30	**KHAZA**	**KHAZA**	**KHAZA**	**KHAZA**	**KHAZA**
13:30-14:30	Disaster Mitigation & Disaster Preparedness (AP)	Disaster Response by Nepal Police	Community Mass Casualty Management (MN)	Simulation Exercise on Community Disaster Management	Group Presentation
14:30-15:30	Environmental impact in Urban Communities	Video	Local Level Disaster Management (MN)		Community Involvement in Disaster Management (MBT)
15:30-15:45	**TEA**	**TEA**	**TEA**	**TEA**	**TEA**
15:45-16:45					Closing Ceremony

Ward No. 34 is unique in the sense that, it has been able to bring together different stakeholders: the community members, CBOs, NGOs, INGOs & local & central government representatives to a common forum and instill in them a sense of the value of working together for disaster management. However, it lacks adequate funding for continuing training program. The DMC should also seek support in human resource development so that it itself is equipped with trained manpower in the future.

Bhaktapur, Ward No. 17:

Similar focus group meeting was conducted at Ward Number 17 of Bhaktapur Municipality on May 16, 2001 at 11 AM. This meeting was arranged by the Ward Office. Same types of information were sought in the meeting but due to language problem the native Newari language had to be translated into Nepali and vice & versa.

There were altogether 21 native residents. The meeting was held for one and half-hours.

It was expressed that nobody could guess when such earthquake occurs so nobody was prepared to face. They said they were willing to follow whatever the technicians would suggest.

They said that the local community has a history of mutual cooperation in such disasters. In the year 1988, six persons died and one fell down from the window all due to earthquake. During that disaster too for almost a week the affected ones were helped by the Ward Office. They were supplied food & given temporary shelter. But the government distributed money also to those who were not victims of this earthquake & their loan money was pardoned. This kind of partiality has to be completely stopped.

There were three women in the group; they thought such disasters occur & we can not control. We just should pray to God and the Almighty would do whatever needs to be done. Since several participants were relatively old persons, most of them carried similar viewpoints.

All were of the view that local clubs, schools, Trusts (religious & social) and *guthi* should be mobilized. They also suggested that more & more people should be sensitized, volunteers should be trained for rescue operations. There should be a trust fund established at the ward level specifically for disaster management & these kinds of information need further dissemination. The Ward Chair also promised that he is fully prepared & committed to help in this regard.

Concern was expressed on poor condition of medical facilities in Bhaktapur. In case of such disaster, they thought the biggest hurdle to help will be lack of medical facilities. So organization such as the Red Cross should be fully supported. Some younger participants also were curious in learning some precautionary measures. They said they had heard from their grand parents that the traditional houses were locally made which were not tall & were well hooked. But modern houses were RCC houses, and they were unaware of their features in relation to earthquake mitigation.

The younger groups were prepared to get involved in rescue operation & mitigation via proper training. All including the Ward Chair said that they have realized a need for a Ward Level Disaster Management Committee which could be instrumental in coordinating all community based organization for disaster management. The participants informed the researcher the existence of 13 such functional organizations, which could be mobilized on such disaster.

Summary of Focus Group Meeting/ Community Meeting, Bhaktapur

• Date/ Time	May 16,. 2001, 11 - 1 PM
• Place	Bhaktapur Municipality, Ward No. 17
• Participants	21 Native residents and 4 persons from NSET including Mr. Fumio Kaneko. All of the community members belonged to the ward. Ward Chair, & clubs members, and school teachers were among the participants.
• Topics of Discussion	■ Risk Perception ■ Preparedness ■ Prior Earthquake Experience
• Output of Discussion	■ Risk Perception (i) Most of the participants had the view that earthquake occurs due to the wish of Almighty God so nobody can stop. (ii) People should be religious minded & only devotion to God could protect from disaster. (iii) They expressed an utmost desire to get trained in precaution measures. ■ Preparedness (iv) Younger generation learned from parents the advantages of old type of building technology with appropriate wooden locks on wooden beams. But they were unaware of modern RCC buildings and were eager to get training on precautionary measures & rescue operations. (v) They suggested to protect school compound and temple area for any future rescue operation. (vi) They also suggested training to volunteers from local clubs & school students. (vii) A great concern was expressed for the ill preparedness of medical facilities in Bhaktapur. (viii) The Ward Chair agreed to act as an umbrella institution to coordinate the required activities of community based organizations for rescue operation & rehabilitation. He also promised to create a fund if NSET took preliminary steps such as technical guidance. ■ Prior Earthquake Experience (ix) The Ward Chair and other participants said they had helped the earthquake victims of 1988 by assisting them to construct house. They were supplied with food & temporary shelter. Seven persons died in the Earthquake. But they expressed their utter dissatisfaction with some money distributed by the government to the fake victims of the 1988 earthquake.

7.3 What have the Survivors of Great Earthquake of 1934 to Say?

Key Informants are those persons who are knowledgeable about the particular issue in question. They are more informed and could make their own impression & opinion in that regard. The community where they live- also respects their opinion and believe in their explanations. The purpose of such meetings with 2 Key Informants was to supplement our knowledge regarding the Great Earthquake of 1934. There are strictly few documents and only one book written by Rudra Shamkar J. B. R., which describes the disaster in Nepali language. It was thought that if some living knowledgeable persons were available for sharing their impressions on that Great Earthquake that would enrichen the wealth of knowledge and also make the issue more lively. So two persons who had survived that Great Earthquake were selected for separate meetings so that their feelings & information could be recorded.

More specifically, the aim of KIS was to collect factual and perceptive information from some of the survivors of the 1934 Great Earthquake. As survivors, they would be better informants in describing the event, its magnitude destruction of buildings & utilities, & help received from the government/ non-government & international agencies. They could also share the trauma that they might have been experiencing throughout their life.

Informant Number 1

Mr. Niranjan Narayan Dhaubadel; Mr. Dhabadel is 80 years of age and lives in Taumadi Tol (hamlet), Pubahal of Ward Number 11 of Bhaktapur Municipality. This is the heart of Bhaktapur town. He was a boy of 13 during the period of that Great Earthquake.

On that day at that particular moment, Niranjan had gone to the post office where his brother Mr. Krishna Mohan used to work. He was taking sun bath and they heard a fearful sound, which resembled like the sound of vehicles. They thought that a procession of the Brigadier General Mr. Bikram Shamsher J. B. R. has come. On such visits all common citizens were supposed to stand in line on the street to pay respect to the Rana Officer. It was also during the Rana regime. The floor of the house also began trembling producing lot of noise. Niranjan asked his brother if the Pucca house had any wooden underground structure they ran out of the building but during the same moment, the wooden beam (*tunal*) fell down. His brother pushed him away and this helped him not to get hurt. Niranjan, his brother & his friends went running in panic towards the temple Nyatapola, which had a large yard but they saw the temple head (Gajur) falling. By the time several houses also collapsed and the pathways were blocked due to debris.

When they were running he heard a woman screaming for help who was under a fallen building. Several other were also crying. Niranjan managed to company with the army attendants of Rana Officer who took all of them to the garden and all of his family members got temporary shelter there for few months. There were occasional tremors so nobody would dare to return home though Niranjan's house remained undamaged. He said this house was bought by his grand father from the priest of Newar Malla King. And the house was constructed with all astrological consideration so that neither there will ever be a shortage of wealth (Goddess of Wealth will always reside in that house) nor any earthquake will damage that house.

At the moment all Dhaumadel family members had been worshipping in the inner room locally known as "Agam" a sacred place to worship the Dynasty God. That was the reason Niranjan thinks they were protected by their dynasty God (*Kul Deota*).

Other victims were rescued on open spaces mostly around temples. It was mainly the government, which had helped them with food & shelter. The government also extended loan to the victims to construct houses. It was Rs. 1,000 and more. Latter, due to the pressure of International donors the loans were written off.
That time Japani clothes were also made available. The price of cotton cloth was 8 paisa for a yard. For few days everybody seemed gentle but after 3 or 4 days people started stealing from the fallen

houses. There was a beleif that Rana Prime Minister thought the Newar Kings had hidden treasure under a huge stone in that park and on the day army soldiers were ordered to move that stone. The moment they started trying to move the stone, the whole earth trembled. Niranjan holds the view that though Rana Prime Ministers were enjoying & ruling, but they were also very patriotic and cared Nepal most. They loved their subjects also. But the government at present is not that serious and very corrupt. He holds the opinion that unless the government is sincere, the narrow areas & the haphazard urban development can not be arrested.

Niranjan had 6 sons, 3 daughters & 15 grand children. He was living with his eldest son.

Summary of Experience of Key Informant,
Mr. Niranjan N. Dhaubadel, Bhaktapur, Age 80 years.

- *A fearful sound was heard. The floor of the house began trembling with lot of noise. All ran in panic.*
- *Several buildings suddenly collapsed, pathways blocked*
- *The dome head of the temple Nyatapola also fell like sand heap.*
- *Many people including women were heard screaming for help.*
- *He was escorted to an open garden by the then Royal Guard to rescue.*
- *Those who survived, it was due to the grace of God*
- *It was mainly the government who helped the victims with food and temporary shelter mostly around temple courtyard.*
- *Government also extended loan of Rs. 1,000 per family who needed to borrow for the construction or repair of house.*
- *Japani clothes with minimal price were also made available*
- *Rescued people seemed cooperating each other but after few days they began stealing from each other.*

Informant Number 2

Mr. Bhakta Bahadur Acharya is 89 years old and is a resident of Dhobighat, Lalitpur. He was formerly a resident of Paknajole in Kathmandu but had moved to Lalitpur in 1956. He lives with his youngest son. He was 21 years of age at the time of the Great Earthquake of 1934. He worked for General Bahadur Shamsher J. B. R., the son of Juddha Shamsher J. B. R. (one of the Rana Prime Ministers) all throughout his life. He worked as a priest and became a very religious person. ***He is a stern believer of God, the Almighty and thinks that those who survived that great earthquake were only due to their religious deeds.***

At the time of the disaster, he was playing cards in an open place named as - Sallaghari in the border of Thamel & Paknajole. All of a sudden the earth (ground) began circling. The trees touched the ground and stood straight. All started crying and praying to God. He thinks he survived because he was on the open ground. Most affected areas were the city cores of Asan and Indrachowk. The reasons were the crowded houses and the houses were mostly built with unbaked bricks. In his locality Paknajole & Thamel, there were less destruction and this was all due to the religious minded people who resided over that locality during that time. This was what Mr. Acharya thought about.

First, the tiles and then the whole house just crumbled; the sky got covered by the dust and it looked as if the world was going to end.

Mr. Bhakta Bahadur said that the Rana rulers lent money to the needy for house construction and food & shelter were also provided by the government. Loans were later written off by the Rana Prime Minister. Bhakta Bahadur also took the shelter in a tent for nearly 6 months with others though his house was standing. He said all were scared of entering the house as any moment it could fall. There were frequent tremor for several days.

He said Newars & Marwadis (viz. Marwadi Sewa Samiti) have their own social organizations which could be of immense help during such disasters but 'Parbate' (those from the Hills mostly Brahmin & Chhetries) people don't have such organization nor even they help each other.

There is one informally created 'Satsang' (a place where devotees go & meet once in a week to chant religious songs and hear religion related philosophy) in Jawalakhel and Bhakta Bahadur thought this could be of help during disaster.

He further advised that one must be a devotee of Almighty. Once you express yourself one hundred percent faith in God and surrender yourself to Him, you will be protected by him for ever.

Summary of Experience of Key Informant,
Mr. Bhakta Bahadur Acharya of Lalitpur, Age 89 years.

- *He was playing cards on an open space when he experienced the earth circling with a totally unfamiliar fearful underground noise.*
- *The tall trees began bending and top touching the ground. It was a great earthquake.*
- *People began panicing, crying & praying to God.*
- *He thinks he survived by the Grade of God.*
- *Most affected areas were Asan and Indrachowk, the city core.*
- *Most of the buildings made of unbaked bricks and built with mud got completely collapsed*
- *The Rana Rulers lent money to the needy for house construction/ repair and provided food and temporary shelter to the victims*
- *Several of the victims were inside the tent for about six months including the Informant.*
- *All feared that during that time another dreadful earthquake could occur any moment.*
- *Mr. Acharya thinks it is only the faith in God & involvement in religious activities such as 'Satsang' which would make the devotees helpful to each other & in time of disaster they could help each other.*

VIII. ASSOCIATION OF SELECTED VARIABLES

CROSS- TABULATIONS

In this chapter an attempt is made to see if any association existed between the few selected variables. For this cross tabulations were done.

8.1. Ethnic Group and Group Affiliation

Though there were nearly 7 ethnic groups in the study sample, majority of them (80%) were Newars and Newars, Brahmins & Chhetries made 96% of all the ethnic groups. In order to see which ethnic group was affiliated with what type of rural social organization, the cross-tabulation clearly shows that Newars were affiliated mostly with *guthi* (79%) followed by clubs (12%). Group solidarity is relatively stronger among the Newars & such cohesion is maintained by *guthi*s. Nevertheless, the younger generations might also be interested to socialize among themselves with associations like clubs of like-minded people. About other ethnic groups since they were so small in number that any interpretation in this regard may not be that useful (Table 49)

Table 49 : Ethnic Group by Group Affiliation

Affiliated Group	Ethnic Group													
	Newar		Brahmin		Gurung		Chhetry		Terai Region		Rai/Limbu		Others	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Guthi	79	69.9		0.0		0.0	1	25.0		0.0		0.0		0.0
Club	12	10.6		0.0		0.0	2	50.0		0.0		0.0	1	100.0
Sports Club	3	2.7		0.0		0.0		0.0		0.0		0.0		0.0
Rotary	1	0.9		0.0		0.0		0.0		0.0		0.0		0.0
Temple Cons.	3	2.7	1	33.3		0.0		0.0		0.0		0.0		0.0
School Cons.	2	1.8		0.0		0.0		0.0		0.0		0.0		0.0
Others	13	11.5	2	66.7	1	100.0	1	25.0	1	100.0	1	100.0		0.0
Total	**113**	**100**	**3**	**100**	**1**	**100**	**4**	**100**	**1**	**100**	**1**	**100**	**1**	**100**

8.2. Group and Occasion of Meeting

Table 50 shows that those who were affiliated with *guthi* mostly they met either during festivals or funeral times (75%). Some others mentioned once in a year. Those who were affiliated with clubs, little more than one-third (36.4%) said they met once in a week. Some others mentioned during festival times, once in one month & once in a quarter (18% each). So, clubs were places to meet more frequently but *guthi* maintained tradition of community participation in social & religious activities.

Table 50 : Type of Group by Purpose of Meeting

Type of Group	Occasion of Meeting													
	Guthi		Club		Sports Club		Rotary		Temple Cons.		School Cons.		Others	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Every Week		0.0	4	36.4		0.0			1	50.0			1	5.6
Festival Time	33	41.8	2	18.2	3	60.0				0.0			4	22.2
Funeral Time	26	32.9		0.0	2	40.0				0.0			5	27.8
Every Month		0.0	2	18.2		0.0				0.0			4	22.2
Quarterly	5	6.3	2	18.2		0.0			1	50.0			2	11.1
Half Yearly	2	2.5		0.0		0.0				0.0			1	5.6
Once in a Year	13	16.5	1	9.1		0.0				0.0			1	5.6
Total	**79**	**100**	**11**	**100**	**5**	**100**	**0**	**0**	**2**	**100**	**0**	**0**	**18**	**100**

8.3. Level of Education and Retrofitting

An attempt was made to see if there was any relationship between the level of education & retrofitting. Table 51 indicates a mild correlation between the level of education & willing to retrofit. Among the illiterate people 71% said they wanted to retrofit against 29% who said they did not. Though some figures are not consistent but the higher the degree the more is the percentage of people willing to retrofit.

Table 51 : Level of Education by Retrofit

Education	Wants to Retrofit House		Does not Know		Total	Missing
Illiterate	12	(70.6)	5	(29.4)	17	3
Primary School	19	(86.4)	3	(13.6)	22	1
Lower Secondary	7	(77.8)	2	(22.2)	9	3
High School	24	(80.0)	6	(20.0)	30	1
B.A. Equivalent	25	(92.6)	2	(7.4)	27	
M.A. or Ph.D.	5	(83.3)	1	(16.7)	6	
Total	**92**		**19**		**111**	**8**

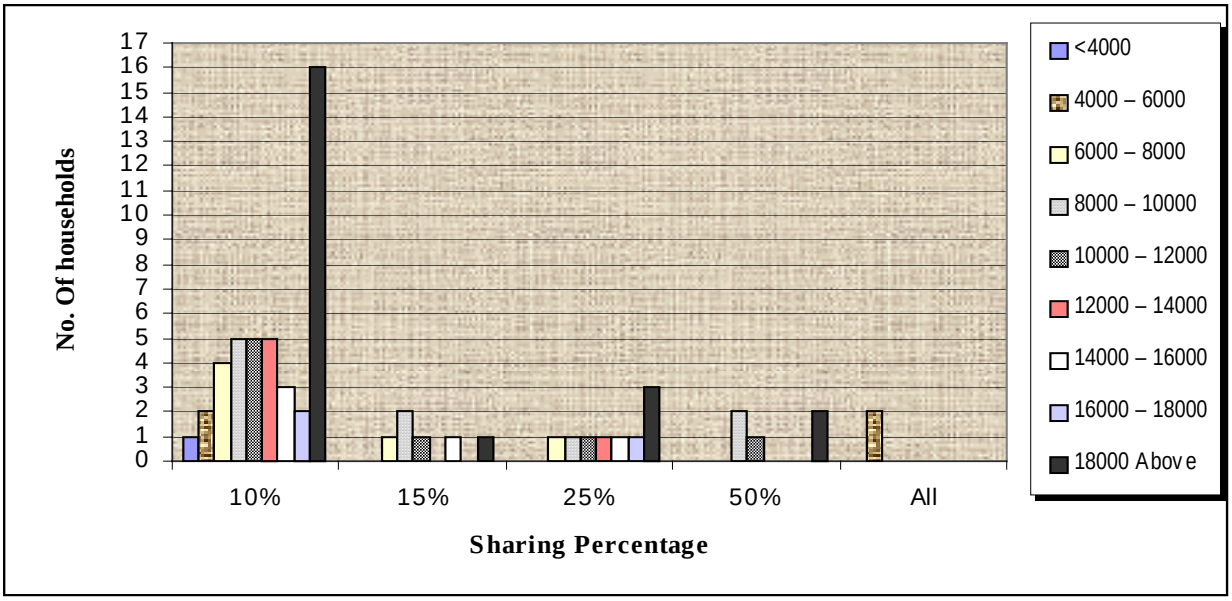
Figures in the parenthesis indicate percentages.

8.4. Level of Income and Cost-Sharing

Table 52 shows that those who were willing to retrofit, residents of all income bracket said they were prepared to bear the 10% cost. But higher was the income level more were the number of households who were willing to share the cost. These who had the income of Rs. 18,000 or more there were 16 persons who said would share 10% cost.

Table 52 : Income by Percentage Cost Sharing for Retrofit

Cost Sharing	<4000	4000 – 6000	6000 – 8000	8000 – 10000	10000 – 12000	12000 – 14000	14000 – 16000	16000 – 18000	18000 Above
10%	1	2	4	5	5	5	3	2	16
15%			1	2	1		1		1
25%			1	1	1	1	1	1	3
50%				2	1				2
All		2							
Total	**1**	**4**	**6**	**10**	**8**	**6**	**5**	**3**	**22**



8.5. Level of Education and Perception of Earthquake

Many people in Nepal believe that such disasters occur when God gets angry with sinners (human being). These kinds of superstitions gradually fade away when one starts getting more exposed via education. An attempt was made to see if any relationships existed between these two variables. It was interesting to note that there existed a direct and positive correlation between the level of education and perception of earthquake.

There were 18 residents who were illiterate and 61% said earthquake was due to God's wish. Higher was the degree lower was the percentage who said it was a God's wish. Eighty seven percent of graduates said it was not due to the wish of God. (Table 53)

Table 53 : Level of Education by Perception of Earthquake as God's Wish

Education	Perception		
	Earthquake is God's Wish		Not it is Not
Illiterate	11	(61)	7
Primary School	12	(55)	10
Lower Secondary	4	(37)	7
High School	6	(20)	25
B.A. Equivalent	3	(12)	22
M.A. or Ph.D.	1	(17)	5
Total	**37**		**76**

Figures in the parenthesis are percentages.

8.6. Level of Education and Familiarity to Earthquake related Documents

An attempt was made to see if education and familiarity of earthquake related documents were related. Table 54 shows that higher was the level of education, higher was the percentage of those who had read the related documents. There was a direct & positive correlation between these two variables.

Table 54 : Level of Education by Familiarity to Earthquake related Document

Education	Familiarity		
	Have Read the Materials		Have not Read
Illiterate	1	(6)	17
Primary School	4	(18)	18
Lower Secondary	3	(25)	9
High School	16	(52)	15
B.A. Equivalent	18	(69)	8
M.A. or Ph.D.	5	(83)	1
Total	**47**		**68**

Missing value are 4.

RISK PERCEPTION

Description of risk perception scale (RPS) appears in 2.3 of chapter II. As described earlier a RPS was developed and all the households were grouped according to their rank order as high, moderate or low. Those who scored 27 or more points were in the high, those who scored 16- 26 points were in the moderate & those who scored 15 or less were put in low category. Since there was one household who did not respond to several questions, he was excluded from the count, which left the total number of households as 118 for this section. It was found that majority of the households were high in the RPS (58.5%) whereas 39.8% households were ranked as moderate with only 2 households in low rank. (Table 55)

Table 55 : Households ranked according to Risk Perception

Risk Perception	Household	
	No.	Percentage
High (27 and above)	69	58.5
Moderate (16- 26)	47	39.8
Low (15 or less)	2	1.7
Total	**118**	**100**

When the households were arranged according to the districts they belonged to and their rank order was seen, data showed that higher percentage of households in Lalitpur were in high RPS compared to Kathmandu & Bhaktapur residents. (Table 56)

Table 56 : Risk Perception by Districts

District	Kathmandu		Bhaktapur		Lalitpur	
	No.	%	No.	%	No.	%
High (27- Above)	42	55.3	12	52.2	15	78.9
Moderate (16- 26)	32	42.1	11	47.8	4	21.1
Low (15 or less)	2	2.6		0.0		0.0
Total	**76**	**100**	**23**	**100**	**19**	**100**

Risk perception was then matched with few other variables to see if these variables were related to risk perception. They are as follows.

8.7. Risk Perception by Cluster

To see if clusters i.e. whether their residence had any thing to make a person high, moderate or low in RPS, the ranking was matched against clusters. Traditional cluster residents had highest percentage in high rank order (100%) followed by city core (59%), new development (56.4%) & commercial/ semi-commercial clusters (50%) respectively. (Table 57)

Table 57 : Risk Perception (Clusterwise)

Risk Rank	Comm.+Semi		City Core		New Development		Traditional		Industry	
	No.	%	No.	%	No.	%	No.	%	No.	%
High (27- Above)	8	50.0	23	59.0	22	56.4	12	100.0	4	30.8
Moderate (16- 26)	6	37.5	15	38.5	17	43.6		0.0	9	69.2
Low (15 or less)	2	12.5	1	2.6		0.0		0.0		0.0
Total	**16**	**100**	**39**	**100**	**39**	**100**	**12**	**100**	**13**	**100**

This may be true for the mere fact that both the traditional and city core buildings may be generally old and the inner walls could still be with unbaked bricks. This condition of the building in those particular clusters itself create a psychological feeling of risk among the residents.

8.8. Risk Perception & Sex

Table 58 shows that women rank higher in the RPS compared to male as 69% of the women were in the high rank order compared to 55% of male in the same rank. Gender inequality is distinct in the Nepali society as they have more or less defined role expectations as being male or female. Female are the ones who live inside the house most of the time and they might be more at risk compared to men as regards to disaster. This may be a condition for women to be at higher risk perception.

Table 58 : Risk Perception by Sex

Risk Rank	Male		Female	
	No.	%	No.	%
High (27 - Above)	49	55.1	20	69.0
Moderate (18-26)	37	41.6	8	27.6
Low (9-17)	3	3.4	1	3.4
Total	**89**	**100%**	**29**	**100%**

8.9. Risk Perception by Age

Households were grouped into 3 age group categories i.e., below 40 years of age, 40- 50 years and 50 years and above. Table 59 shows that those within the 40- 50 years were relatively more in the higher risk perception category compared to other categories. Actually this is the age group when Nepali people think they are now matured, experienced and have control on their environment. They have a high morale. This then leaves them with high expectations and consequently requires more efforts. Conversely, they have a cause to feel more risk of this disaster because they have to get several things done. However, those who are in the higher age bracket may not have higher expectation, instead a peaceful mind and retirement. They may be more religious oriented and they may not see future in their hands which leaves them to scoring less in the RPS.

Table 59 : Risk Perception by Age

Risk Rank	Age					
	<40 Years		40 - 50 years		50 Above	
	No.	%	No.	%	No.	%
High (27 - Above)	25	58.1	19	65.5	25	54.3
Moderate (18-26)	18	41.9	9	31.0	18	39.1
Low (9-17)		0.0	1	3.4	3	6.5
Total	**43**	**100**	**29**	**100**	**46**	**100**

8.10. Risk perception by Education

Table 60 shows that among households with primary and lower secondary level education there were quite a few cases in moderate risk perception ranking but higher the level of education, higher was the risk perception.

Table 60 : Perception by Education

Risk Rank	Education											
	Illiterate		Primary School		Lower Secondary		Higher Secondary		B.A. Equivalent		M.A. or Ph.D.	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
High (27 - Above)	11	57.9	12	52.2	5	41.7	22	71.0	15	55.6	4	66.7
Moderate (18-26)	5	26.3	10	43.5	7	58.3	9	29.0	12	44.4	2	33.3
Low (9-17)	3	15.8	1	4.3		0.0		0.0		0.0		0.0
Total	**19**	**100**	**23**	**100**	**12**	**100**	**31**	**100**	**27**	**100**	**6**	**100**

The total no. of Illiterate are 20. One has been ignored due to non response of several questions

8.11. Risk Perception and Willingness to Ensure House

This is a common believe that those who perceive the risk high would be more willing to ensure their houses. Data is consistent with this assumption. Those who were in high risk perception, 63.8% said they were willing to ensure whereas only 40.4% were willing to ensure in the moderate rank and 50% were willing to ensure in the low rank category. (Table 61)

Table 61 : Risk Perception by Willingness to ensure house

Willingness	High		Moderate		Low	
	No.	%	No.	%	No.	%
Yes Want to Insure	44	63.8	19	40.4	1	50.0
Does not Want Insure	24	34.8	23	48.9		0.0
Missing	1	1.4	5	10.6	1	50.0
Total	**69**	**100**	**47**	**100**	**2**	**100**

IX. SUMMARY & CONCLUSION

9.1. Summary:

Fragile geology & steep topography are threats to Nepal in disaster terms. Three disastrous earthquakes, one each in 1810, 1833 and 1866 occurred in the 19th century and in the 20th century earthquakes of 1934, 1982 and 1988 were of greater magnitude. Since the return period of a large-scale earthquake like that of 1934 is about 75 years in this region, such an earthquake is expected anytime in Kathmandu valley hence this situation warrants an urgent attention.

The objective of the SSS is to clarify, identify & characterize the potentials of disaster mitigation in Kathmandu valley so as to prepare a comprehensive disaster mitigation plan.

The three districts of Kathmandu, Bhaktapur & Lalitpur were categorized into various clusters and altogether a sample size of 119 households were selected from these clusters.

Various methods such as the personal interview, focus group meeting and Key Informant survey were used to collect information.

A summative scale was developed whose value ranged from 4 to 38 points and named as the risk perceptions scale (RPS). This scale could rank the households as High, Moderate or Low according to the scores they obtained.

Following are the highlights of finding.

Most of the households were male, relatively young, literate, and Newars with medium to large family size living in a joint/ extended family. They were mostly self employed. Most of the households had more than one income earning family members who walked to nearby places to work. Most of them spent more than Rs. 8,000 a month. They spent mostly on food & education.

About water, dug-wells were important source to many. Public stand pipes & roar pumps were also important. They had reservoir & received water from the Nepal Water Supply Corporation though mostly on alternate days. They did not have food & water reserves for several days.

Both new and old residents (one-third were since one generation) resided there but most of them were affiliated with group such as the Guthi with an average of 100 members or less. Neighbors were the most important source of information as well as for mutual help & desired shelter during disaster. They visited temples & monasteries for worshipping.

Open space followed by school compounds were the potential places for rescue & shelter. Mostly the households owned their houses & rented the ground & first floors whereas, they lived on the upper floors. It was reported that several did not follow the building code and they said they would construct the house at the same place if the disaster damaged it. They also expected some loan assistance from the government. They were also willing to retrofit their buildings but said they might need financial assistance. About communication media, mostly they used telephone & home visits.

Cracked buildings were the most important hazard followed by high tension electric wires. Most of them thought great earthquake was going to occur in Kathmandu valley and said if an earthquake equivalent to the one in Gujarat on 26 January 2000 occurred in Kathmandu, most of the houses will be damaged. This has worried them to a great extent and thought they could do something if proper building codes were followed. Several of the households were also interested in rescue operation but suggested for relevant training.

In case of disaster most of them said their whole family will be mobilized for rescue operation & carrying manually or with stretcher will be the most practical ways of helping. They were willing to share the shelter & food in case of disaster.

Out of all utilities & facilities, hospital was the one which carried top most priority to get repaired after disaster.

Households were organized into groups such as the *Guthi* & clubs. Such social organizations were useful in preserving social cohesion & extending mutual cooperation. There were several community based organizations found in the clusters which had great potentials to function for disaster management. Group discussions also lead to the impression that there exists a great deal of willingness among the people to get prepared for mitigation measures.

The study reviewed relevant literature and interviewed 2 of the senior citizens as informants of the 1934 great earthquake and documented the horrible experience/ disaster which killed thousands of people & damaged hundreds of thousands of infrastructure including the buildings.

It was found that Newars were organized in *Guthi*s who mostly met during festival & funeral times. Club members met once in a week. The higher was the level of education more was the desire to retrofit the building. Similarly, income level was associated with cost share of retrofitting. Education was also found to be related to perception regarding earthquake as God's wish. More illiterate people thought it was the wish of God. Educated people were also updated with earthquake related documents.

At the end, association of some of the selected variables was examined. Almost all of the households were moderate to high in the RPS. In the three districts, majority of the households were in the high RPS & there were more in Bhaktapur & Lalitpur who scored low.

Cluster-wise risk perception data reveals that in the traditional & city core clusters there were higher percentages of high RPS households. Female households ranked relatively high in the scale compared to male. Those who were in the age group of 40-50 years ranked relatively high in the scale compared to the younger or older age groups. Higher was the level of education higher was the risk perception. Similarly, level of risk perception was also associated positively with the willingness to ensure house.

A summary of Cluster wise/ Area wise characteristic of households is provided below. (Table 62)

Table 62 : Area wise/Cluster wise Characteristics of Households-A Comparative Chart

Classification	Infrastructure			Perceived important Earthquake Hazards	Socio-Economic Profile		
	Road (Those who think Narrow street is a problem)	Public Facilities (Frequently mentioned Shelter place)	Water		Socio-economic	Community Organizations	Risk Perception (H= High M= Medium L= Low (in %)
Overall	Four-Fifths	Mostly Neighbor's Houses	For the Majority water is made available by the NWSC	Cracked Building	Mostly joint family with large size, literate, Newars and self employed	Overwhelming Guthi	Mostly High
City Core	Nearly Three-Fourths	Neighbour's House	Three- Fourth received water but Fourth-Fifth don't have tank	Cracked Building	• Mostly high school or less, one fourth illiterate • All Newars • Majority large size & Joint • Half self employed & rest employed by others • Public sector jobs & services • Mostly walk to work place • Almost all communicate with neighbor	Majority with Guthi	H= 59 M =38 L =3
New Development	Over whelming majority	Neighbour's House	• All except one have received water • One-Third have no water tank	• High tension electric wire • Cracked Building	• Mostly high school or less • Mostly Newars & others Chhetri & Brahmins family • Majority large & Joint • Employed & self employed almost equal • Services, Public sector job & shops • Walk & take bus to work place • Almost all communicate with neighbor	Majority with Guthi	H= 56 M= 44 L= 0
Traditional Settlement	Three - Fourths	Neighbour's House Friend & Relatives	• All have received water • None have any tank	Cracked Building	• Nearly half High School, one fourth illiterate • All Newars • Majority large & joint but more than one-third Nuclear • Self employed & employed almost equal • Service & Agriculture • Mostly walk to work place • Almost all communicate with neighbor	Guthi & Clubs	H= 100 M= 0 L= 0
Commercial	Nearly Nine-Tenths	Relatives	• All have received water. • Most of them have tanks	Cracked Building	• Majority family size large & joint • Half of them graduates • Predominantly Newars • Mostly self employed • Trade & shops • Mostly walk to work place • almost all communicate with Neighbor	Guthi	H= 50 M= 37 L= 13
Industry	More than Four-Fifths	Temporary shelter & Relatives	• All have received water • All have tank	• Cracked Building • Gas cylinder	• Majority large & Nuclear • Illiterate none one-third graduates • Newar, Brahmin & Chhetries • Mostly self employed • Services & shops • Mostly walk to work place • All communicate with neighbors	Clubs & some with Guthi	H= 31 M= 69 L= 0

Source: Field Survey, 2001.

9.2. Conclusions:

- Due to its typical geo-physical features, Kathmandu valley is more prone to earthquake disaster.
- Women and households of 40-50 years of age tend to be more risk- perception sensitive.
- Households don't have enough food & water stock, which may be of use to others during disaster time.
- Households valued more to education compared to health services.
- Households were mostly religious minded and had the attitude of helping each other.
- Most of the households would prefer to stay in their own house after repair so it may be difficult to resettle them in new places.
- Most of the households were found sensitive to earthquake disaster.
- Households felt they were not well prepared for mitigation measures however, they were prepared to volunteer for rescue operation when needed and expressed a need for relevant training.
- There still existed mutual cooperation among the Nepalese as they prefered neighbors' houses as places for emergency shelter.
- The community is less stratified on caste ground as they were prepared to share shelter & food together in case of disaster.
- Social organization such as *Guthi*, clubs, trusts and associations are very useful community based organization, which may be well mobilized during disaster time.
- Level of risk perception was relatively high in the traditional area & the city core clusters. Sex, age & education were related to risk perception. Similarly risk perception was also related to willingness to ensure the house.

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ANNEX

District Name;	
Ward No.;	
Sample No.;	
Surveyor;	
Survey Date;	

QUESTIONNAIRE
FOR
SOCIAL STRUCTURE SURVEY
IN
KATHMANDU VALLEY

February 2001

Purpose:
The survey was organized under the Earthquake Disaster Mitigation Project, in cooperation with the Ministry of Home Affairs (MOHA), of the His Majesty's Government of Nepal. The survey intends to clarify present social potentials for the earthquake mitigation in Kathmandu Valley and will be used for the Earthquake Mitigation Planning only. This is not be used for other purposed at all. The results of the survey are all valuable information in assessing the project and will be "CONFIDENTIAL" . The result will be processed in statistically and don't contain individual information. And all the questionnaire sheets will be submitted to JICA. After summing up the results, we are providing you the summary of the results in July. We appreciate your cooperation. Thank you very much.

This is the sample questionnaire sheets and will be developed through the discussion with a local Social Economist.

A. House Hold Characteristics

Q. 1 Your sex

☐ Male ☐ Female

Q.2 Your age

_____

Q.3 What is your educational attainment ?

☐ Illiterate ☐ Primary school ☐ Middle school

☐ Highschool ☐ B.A. equivalent ☐ M.A. or Ph.d.

Q.4 Your ethnic group (choose one below)

☐ Newar ☐ Brahmin ☐ Tamag / Sherpa

☐ Gurung/ Magar ☐ Damai/Kami/Sarki ☐ Chhetri

☐ Tarai Origin ☐ Rai / Limbu ☐ Others

Q.5 Number of family members in your household (put actual figure)

_____

Q.6 What are the members? (put actual numbers in lines)

	number		number
☐ Father	_____	☐ Mother	_____
☐ Grandparents	_____	☐ Brothers/Sisters	_____
☐ Children	_____	☐ Uncle/Aunt	_____
☐ Nephew/Niece	_____	☐ Wife	_____
☐ Relatives	_____	☐ Others	_____

Q.7 Main occupation of your family (choose as any applicable)

☐ Employed (including government officer, company staff, salesman clerk etc.)

☐ Self-employed (including company owner, shop owner, hawker, trader, etc.)

Q.8 What is the type of your work? (choose as any applicable)

☐	Public Sector Service	☐	Agriculture, Forestry
☐	Manufacture	☐	Construction
☐	Services	☐	Others (specify) _____

Q.9 How many people of your family have income generating jobs ? (Including persons who work at home except housewife)

_____

Q.10 How far is your work place? (If several family members are working, answer all)

Distance _____ km Time _____ minuets Main Mode of transportation (Choose from the codes) _____	Distance _____ km Time _____ minute's Main Mode of transportation(Choose from the codes) _____
Distance _____ km Time _____ minute's Main Mode of transportation (Choose from the codes) _____	Distance _____ km Time _____ minute's Main Mode of transportation (Choose from the codes _____
Distance _____ km Time _____ minute's Main Mode of transportation (Choose from the codes) _____	Distance _____ km Time _____ minute's Main Mode of transportation(Choose from the codes) _____
Distance _____ km Time _____ minute's Main Mode of transportation (Choose from the codes) _____	Distance _____ km Time _____ minute's Main Mode of transportation (Choose from the codes _____

Mode of transportation (write in code for que. No.10)

1	Walking	2	Bus	3	Trolley Bus
4	Private Car	5	Taxi	6	Company Bus
7	Motor Bike	8	Others (specify)		

Q.12 Total monthly household expenditure (choose one below)

☐ Less than 3,999 Rs ☐ 4,000 ~ 5,999 Rs ☐ 6,000 ~ 7,999 Rs

☐ 8,000 ~ 9,999 Rs ☐ 10,000 ~ 11,999 Rs ☐ 12,000 - 13,999 Rs

☐ 14,000 - 15,999 Rs ☐ 16,000 - 17,999 Rs ☐ More than 18,000 Rs

Q.13 Total monthly household income (choose one below) 6,000 ~ 7,999 Rs

☐ Less than 3,999 Rs ☐ 4,000 ~ 5,999 Rs ☐ 6,000 ~ 7,999 Rs

☐ 8,000 ~ 9,999 Rs ☐ 10,000 ~ 11,999 Rs ☐ 12,000 - 13,999 Rs

☐ 14,000 - 15,999 Rs ☐ 16,000 - 17,999 Rs ☐ More than 18,000 Rs

Q.14 How much do you / your family spend for the following expenses monthly (put actual numbe

☐ Food _____ Rs / month (approximately)

☐ Clothes _____ Rs / month (approximately)

☐ House rent _____ Rs / month (approximately)

☐ Education _____ Rs / month (approximately)

☐ Recreation _____ Rs / month (approximately)

☐ Telephone _____ Rs / month (approximately)

☐ Electricity _____ Rs / month (approximately)

☐ Water _____ Rs / month (approximately)

☐ Gas _____ Rs / month (approximately)

☐ Medical _____ Rs / month (approximately)

☐ Others _____ Rs / month (approximately)

Q.15 How do you get water?

				Code of Property	Code of Distance
1 Public standpipe					
☐ Drinking/Cooking use	☐ Washing	☐ Bathing		_____	_____
2 Tube well / rowing Pump					
☐ Drinking/Cooking use	☐ Washing	☐ Bathing		_____	_____
3 Hiti (stone tap)					
☐ Drinking/Cooking use	☐ Washing	☐ Bathing		_____	_____
4 Well					
☐ Drinking/Cooking use	☐ Washing	☐ Bathing		_____	_____

5 Neighbors

☐ Drinking/Cooking use ☐ Washing ☐ Bathing _____ _____

6 Water vendors

☐ Drinking/Cooking use ☐ Washing ☐ Bathing _____ _____

7 Spring (mool)

☐ Drinking/Cooking use ☐ Washing ☐ Bathing _____ _____

8 River / Stream

☐ Drinking/Cooking use ☐ Washing ☐ Bathing _____ _____

9 Others (specify) _____

☐ Drinking/Cooking use ☐ Washing ☐ Bathing _____ _____

Q.16 Can you get water from NWSC?

☐ Yes ☐ No ☐ No Service of NWSC _____ _____

Q.17 How many <u>days a "month"</u> is the water supply available ?

_____ days

Q.18 If you and your family ever do washing <u>outside home</u>, where is it? Whose is it?(Write in code)

		Code of Property	Code of Distance			Code of Property	Code of Distance
☐	Tube Well/ Rowirn Pump			☐	Hiti (Stone tap)		
☐	Well			☐	Spring (mool)		
☐	River/Stream			☐	Others		

Q.19 If you and your family ever do bathing <u>outside home</u>, where is it? (Write in Code)

		Code of Property	Code of Distance			Code of Property	Code of Distance
☐	Tube Well/ Rowirn Pump			☐	Hiti (Stone tap)		
☐	Well			☐	Spring (mool)		
☐	River/Stream			☐	Others		

Code of Property ownership of water resources in question No.18 & 19

☐ 1	Municipality/Public	☐ 2	Community	☐ 3	Individual
☐ 4	Religious Authority	☐ 5	Others		

Code of distance

☐ A	less than 10m	☐ B	10 -50 m	☐ C	50 -100m
☐ D	100 - 200 m	☐ E	200 - 500 m	☐ F	more than 500 m

Q.20 Do you have a roof tank or / and underground water tank at home?

☐ Yes ☐ No

Q.21 If Yes,…how much is total volume of water tank (put actual figure)?

_____ ltrs

Q.22 How much water do you consume per day at home ? (For cooking, washing, drinking etc.)

Drinking/ Cooking _____ ltrs Total _____ ltrs

Washing _____ ltrs

Bathing _____ ltrs

Q.23 What is the fire source for cookings?

☐ Firewood ☐ Kerosene ☐ Gas

☐ Electricity ☐ Other

Q.24 Do you know the fire accident in your neighborhood ?

☐ Yes ☐ No

Q.25 If yes, Describe how.

Q.26 Do you keep livestock or pets ?

☐ Yes ☐ No

Q.27 If yes, what kind ?

☐ Cattle ☐ Goat ☐ Pig

☐ Poultry ☐ Horse ☐ Pets

☐ Others

Q.28 What is the area of your house in sq. ft. ? (Specify numbers)

Ground floor _____ Sq. ft. Total _____ Sq. ft.

Q.29 What is the area of your house compound in sq. ft. ? (Specify numbers)

_____ Sq. ft

community (Religious / Social) Developmental/ Entertainment)

Q.30 How long have your family lived here?

_____ years

Q.31 How many generations of your family are living in the house ? (actual number)

_____ Generation

Q.32 Do you / your family belong to any groups for community activities ?

☐ Yes ☐ No ☐ In the past yes

Q.33 If "in the past yes", why you don't belong any more ?

_____

Q.34 If Yes , What kind of group is it ?

☐ Guthi ☐ Club ☐ Sports Club

☐ Rotary ☐ Jaycees ☐ Mandir Nirman / Vyawasthapan

☐ School Nirman ☐ Others Specify _____

Q.35 Do the members of the group live in your neighborhood ?

☐ **Yes** ☐ No ☐ Some are living in the neighborhood

Q.36 Do you ask the group for help in disaster situation

☐ Yes ☐ No

Q.37 Just after the earthquake and suppose telephone doesn't work, who do you ask for help at first ? Except family

☐ Neighbors ☐ Friends ☐ Relatives

☐ Guthi Member ☐ Others Specify _____

Q.38 Suppose your house is collapsed and you cannot live anymore, where do you take shelter

☐ Neighbors house ☐ Friends house ☐ Relatives house

☐ Guthi Member' s house ☐ School ☐ Temple

☐ Temporary Shelter provided by the public sectors ☐ Others Specify _____

Q.39 What kind of activities do you / your family do in the group?

_____

Q.40 Where do you meet?

_____

Q.41 When do you meet? (e.g.. every week, festival time, holiday)

_____

Q.42 How often do you meet?

☐ Everyday ☐ Everyweek ☐ Every month ☐ Every year

☐ Others Specify _____

Q.43 What is the unit and size of the group?

Unit	Size (Number)
☐ Individual	
☐ Family	_____ households / members

Q.44 Does the group / community own specific buildings and compounds ?

☐ Yes ☐ No

Q.45 if yes, how far is it ?

Type _____
Distance _____ km
Time _____ mins

Type _____
Distance _____ km
Time _____ mins

Q.46 Do you go to religious place?

☐ Yes ☐ No

Q.47 If yes, how often do you go?

☐ Every day ☐ Every week ☐ Every month

☐ when I feel like

Q.48 How close is it? (put actual number)

_____ mins.

_____ km.

Q.49 Which facilities in your neighborhood can be the evacuation place and shelter at times of dis

☐ School ☐ Facility of Guthi ☐ Temples

☐ Municipality ☐ Others Specify _____

Q.50 Do you have communications with your neighbors?

☐ Yes ☐ No

Q.51 How often is it?

☐ Every day ☐ Every religious holiday ☐ Seldom

☐ Every week ☐ Every Month ☐ Never

Q.52 Have you visited the house of your neighbors?

☐ Yes ☐ No

Q.53 Do you know the layout of your neighbors house? Approximately where they sleep, and eat

☐ Yes ☐ Probably, I can guess ☐ No

Q.54 What is the ownership of your house?

☐ Own ☐ Rented ☐ Shared

☐ Others

Building

Q.55 How old is your house?

_____ years old

Q.56 What is the type of your house?

☐ Individual ☐ Row ☐ Courtyard type

Q.57 What is the building materials of your house (Ground Floor)?

☐ RCC ☐ Brick in Cement Mortar ☐ Brick in Mud Mortar

☐ Stone in Cement ☐ Stone in Mud ☐ Concert Block

☐ Timber ☐ Steel ☐ do not know

Q.58 Have you used earthquake resistance device in your house / work place ?

☐ Yes ☐ No

Q.59 Describe the condition of house/ work site building

☐ Excellent ☐ Needs some repair ☐ Needs major repair

☐ Hazardous

Q.60 How many story building is your house?

_____

Q.61 Which floor does your family live?

_____

Q.62 Which floor do you and your family members sleep?

_____

Q.63 Which floor is kitchen located?

_____

Q.64 Have you used any loan for the construction cost of your house?

☐ Yes ☐ No

Q.65 Have you ever extended your house?

☐ Yes ☐ No

Q.66 How and how much?

☐ Annexed room ☐ Added stories

Q.67 Have you gotten a building permit of your house?

☐ Yes ☐ No ☐ no needed

☐ don't know

Q.68 Do you know the process of building permits?

☐ Yes ☐ No

Q.69 Do you know why it is necessary?

☐ Yes ☐ No

Q.70 Do you want to earthquake resistant retrofit your house?

☐ Yes ☐ No

Q.71 If yes, up to how much percentage of the construction cost do you want to pay more?

actual number

_____ **%**

Communications

Q.72 What kind of media do you usually use to make a contact with your family members from outside?

☐ Telephones ☐ Telegraph ☐ Internet

☐ Mobile phones ☐ Fax ☐ Visit

☐ others Specify_____

Q.73 From what kind of media source do you get information in your daily life ?

☐ National Newspaper ☐ Local Newspaper ☐ Television

☐ Radio ☐ Monthly Magazine ☐ Internet

☐ Others Specify _____

B. Risk Perception

Q.74 Prioritize the Earthquake hazards in the neighborhood in the increasing order (pur in number

☐ Cracked buildings : ☐ Gas Cylinder Shop ☐ Narrow Streets

☐ High tension electric lines / poles ☐ Building Walls next to each other ☐ Buildings constructed by non-engineers

☐ Courtyard style house ☐ Unsafe walls ☐ Others (specify)

Earthquake and Disaster Experienc

Q.75 Do you think Kathmandu will have a possibility of earthquake during your life time?

☐ Impossible ☐ May be ☐ Possible

☐ Highly Possible ☐ Definite

Q.76 Do you know when was the last earthquake in Nepal or in Kathmandu?

☐ Yes ☐ No

If Yes, describe

_____

Q.77 Have you ever heard the story of 1934 earthquake from somebody ?

☐ **Yes** ☐ No

If yes, from whom ? _____

Q.78 If yes , describe what the story was ?

(Damage of buildings, how people suffered, and evacuate ? If the house was collapsed, how did they repair ?)

Q.79 How often do you worry about earthquake?

☐ Very often ☐ Sometimes ☐ Seldom

☐ Never

Q.80 Have you ever experienced any severe earthquakes?

☐ Yes ☐ No

If yes, describe , Which earthquake did you experience ? How was it ?
(If he/ she has a good information ask for his /her contact number)

Q.81 Have you perceived the extent of the West Indian Earthquake?

☐ Yes ☐ No

Q.82 If the same scale of Western India earthquake occurs in Kathmandu, do you think your house is safe?

☐ Yes, no problem ☐ Partially Collapse ☐ Destroy completely

☐ Do not know

Q.83 If you experience the same Earthquake inside building, what do you do?

☐ Go out of the building ☐ Run in panic ☐ Extinguish Fire

☐ Open the windows ☐ Go to roof ☐ Go to under table

☐ Others Specify_____

Q.84 Which kind of disaster mitigation activities are you interested in?

☐ Rescue/ Relief ☐ fire extinguish drill ☐ Building Retrofit Strengthing

☐ First Aid Training ☐ Drill of evacuation ☐ Settlement Planning

☐ Strong Building Permit (Regulation) ☐ Hazard mapping ☐ Mason Training

☐ Community (Guthi) ☐ Awareness raising ☐ Training / Education

☐ Hazard mitigation others Specify_____

Q.85 From which sources did you get the information on Earthquake Disaster Mitigation ?

☐ Family elders ☐ Friends ☐ TV

☐ Books, Magazines ☐ School ☐ Radio

☐ Others

Q.86 "Earthquake is god's wish" Do you agree?

☐ Yes ☐ No

Q.87 Have you read any earthquake-related materials?

☐ Yes ☐ No

Q.88 If yes, what ?

Describe _____

Q.89 Do you choose earthquake resistant school for your children ?

☐ Yes as first priority ☐ It can be part of the condition ☐ No does not matter

Q.90 Are you willing to assist the school of your children in improving earthquake safety measure?

☐ Yes ☐ No

Q.91 If yes, to what extent?

☐ Somewhat ☐ As much as possible

Q.92 Whom will you blame if your children's school collapses due to earthquake?

☐ None ☐ School committee ☐ Government

☐ Others Specify _____

Q.93 Is it necessary to include earthquake knowledge in the school curriculum?

☐ Yes ☐ No

C. Safety Perception

Personal safety

Q.94 In case of earthquake disaster, how do you evacuate ?

☐ unit of family ☐ community ☐ using voluntary helps

☐ Individual

Q.95 In case of emergency, how do you carry a patient ?

☐ Call ambulance ☐ Use Taxi ☐ Use Private Car

☐ Carry Manually ☐ Carry on Stretcher ☐ Others

Q.96 How much food stock do you usually have at home to sustain your whole family? (except for water)

Food _____ days **Water** _____ days

Q.97 If you lose your house in the disaster, what do you do?

☐ Build new one at the same place ☐ Migrate ☐ Wait for public financial assistance

☐ Ask financial loan ☐ Others Specify _____

Q.98 How the temporary house should be?

☐ Individual family ☐ Caste groups ☐ Mixed

Q.99 How hazardous do you think the kerosene & Gas Cylinder Shops are ?

☐ Vary Hazardous ☐ Partially Hazardous ☐ No problem

If you think hazardous, what should be done ?

Describe

D. Improvement Needs and Mitigation Possibilities

Mitigation Potentials

Q.100 Are you willing to retrofit your house?

☐ Yes ☐ No

Q.101 Retrofitting cost is 120 RS / Sq. ft., do you like to retrofit your house?

If yes, I can afford and am

☐ Willing to install earthquake resistance devices ☐ Cannot afford the cost

Q.102 1. Do you want to learn more about Earthquake Disaster Mitigation ?

☐ **To some extent** ☐ **No Need**

2. Do you think you can assist in rescue and relief after earthquake ?

☐ Fully ☐ To some extent ☐ No

Q.103 The following 11 critical facilities can be seriously damaged by earthquakes. Please indicate your preferences in the increasing order :

☐ Hospitals	☐ Electricity	☐ Shops
☐ Telephone	☐ Water Supply	☐ Government Buildings
☐ Bridges and Roads	☐ Police Post	☐ Private Residence
☐ Schools	☐ Public Offices	☐ Temples/Religious Buildings

Q.104 If the house you are living in falls apart in the earthquake, whom will you blame for it?

☐ Nature ☐ Technician ☐ Self ☐ Luck

☐ Public Authority ☐ Others Specify _____

Q.105 Do you want to insure your house against earthquake?

☐ **Yes** ☐ No

Q.106 How much can you spend for insurance?

☐ Little ☐ Substantial ☐ Not at all

Kathmandu Valley Population is increasing very fast.

Q.107 Do you like to continue living in the same house in future ?

☐ Yes ☐ No

Q. 108 If your family member increase, how do you do?

☐ Live in the same house ☐ Extend my house and remain

☐ Move to a New development area ☐ Shift in the existing settlement

☐ Shift to some other city ☐ others specify _____

Q.109 Suppose your house is destroyed and evacuate somewhere, do you mind sharing the following things with others ?

Food

☐ I don't mind at all ☐ Cannot share with certain caste ☐ Cannot share with different religion

☐ I can only share with the same caste ☐ Other Specify _____

Water

☐ I don't mind at all ☐ Cannot share with certain caste ☐ Cannot share with different religion

☐ I can only share with the same caste ☐ Other Specify _____

Tent / Shelter

☐ I don't mind at all ☐ Cannot share with certain caste ☐ Cannot share with different religion

☐ I can only share with the same caste ☐ Other Specify _____

For additional Notes