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**DPRI-IIASA 3rd International Conference
On**

Integrated Disaster Risk Management

3-5 July 2003, Kyoto University, Kyoto Japan

**"Vulnerables' Perceptions of Disaster & A
Disaster Management Project:
A Case Study from Nepal"**

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Introduction

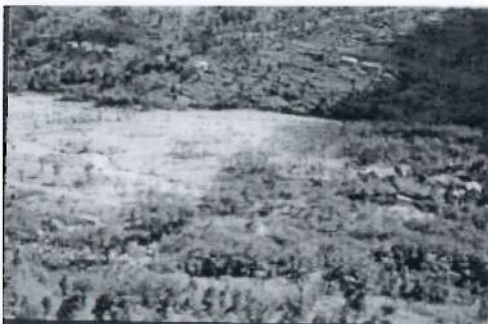
The main aim of this research is to assess the disaster management system in Nepal by analysing how marginalized grassroots communities of disaster-prone areas understand the disasters and a disaster management project in their day-to-day life. This involved the researcher in evaluating and analysing a recently completed Community Development & Disaster Management Project in Nepal. This analysis is based on primary data and secondary data including information collected from published reports books, scientific literatures and maps as well as several unpublished reports. Information were received from various organisations /agencies and individuals in Kathmandu, Delhi, London and Newcastle. Discussions were held (personally and using electronic mail) with experts, officers of different government and non-government organisations, professional societies and individuals who are directly or indirectly involved in disaster management and sustainable development in Nepal.

This research describes and analyses the meaning of vulnerability, disasters /hazards in the Nepalese context in relation to Blaike's model (1994). It also looks how disasters such as landslides, floods, earthquakes, fire, epidemics and drought are affecting Nepalese livelihoods increasing urban and rural vulnerability.

Introduction of the Project

On July 19-21, 1993 an unprecedented disaster, caused by landslide, flood and debris flows, occurred damaging the central development region of Nepal and killing more than 1500 people (in 48 hours) with in massive scale of urban and rural livelihoods disruption, including the national infrastructures.

To study the magnitude of the damage and possible mitigation measures in the severely affected areas a study of the disaster prevention plan for severely affected areas in the central development region of Nepal was carried out under the technical assistance of the Government of Japan on the request of His Majesty's Government of Nepal (HMG/N).



The study suggested two different approaches to formulate community disaster prevention plan. They were a disaster prevention approach and a participatory community development approach. The objectives and countermeasures of the plan were:

- Reduction of physical vulnerability
- Reduction of economical and social vulnerability
- The countermeasures adopted to achieve the objectives were:
 - Structural disaster protective measure
 - Structural prevention measure
 - Non-structural measure
 - Institutional measure
 - Community developmental measure
 - Income generating measure
 - Structural disaster preventive measure
 - Non-structural Measure
 - Institutional Measure

The disaster prevention approach was mainly concerned with the protection against natural hazards in the community. Based on the estimated natural hazard potential, the countermeasures to prevent, mitigate and evacuate from disaster were proposed. The community development approach was mainly concerned with the

reduction of socio-economic vulnerability of the community, which was damaged by natural hazards. The measures were assessed based on the vulnerability assessment of the people in terms of economic and social conditions. The countermeasures were proposed to empower the people to recover from and manage disaster by themselves.

The study only covered the Chisapani village and Majuwa village clusters. The study team studied various sites affected by the 1993 disaster and had recommended community disaster prevention plans for those sites. Based on the recommended plans of the study, Japan International Co-operation Agency (JICA) decided to extend its co-operation to implement a pilot Community Development and Disaster Prevention Program (CCDDPP) in Chisapani (Ward no: 4) of Agra Village Makawanpur District. Later it was renamed as Chisapani Community Development and Disaster Management Programme (CCDDMP).

In this respect, a tripartite meeting was held on 13 February 1998 between HMG/N Department of Soil Conservation and Watershed Management (DSCWM), JICA Nepal office, Nepal Red Cross Society (NRCS) as an implementing agency of the program. The program period was fixed at two and a half years (March 19, 1998 to August 31, 2000) from the JICA side.

The CCDDMP is an integrated program of disaster prevention and community development. It has basically two major support components:

I) Hardware Base (infrastructure, construction) for disaster prevention and protection II) Software base for disaster prevention and management, community development.



The two major elements of software base are a) training, awareness building, and exposure visits, and b) development activities such as community forestry, plantation, nursery and improved agriculture system, adult literacy program etc. Some important disaster management related infrastructure is set up such as establishments of

rain gauge, warning system by bell, evacuation drill etc. Check-dams, bioengineering works, evacuation shelters, school building, retaining wall and toilets are some other hard ware base activities.

In order to provide guidance to the program, a Program Steering Committee (PSC) at central level representation of JICA, NRCS, DSCWM, NRCS Makawanpur district chapter, user committee (initially local steering committee, LSC) of Chisapani and Dept. of Water Induced Disaster Prevention (DWIDP) was formed. The PSC met every trimester. For the program implementation, the implementing agency, NRCS had formed a central sub-committee to look after the program. The over all responsibility of the sub-committee was the timely implementation of the program, which was acted through Disaster Management Department (DMD) of NRCS,

national headquarters (NHQ). A local steering committee (LSC) headed by NHCS sub-chapter Palung chairperson and represented by the Chisapani community people was formed to steer the programme administratively and financially at local level. A program implementation unit at NRCS NHQ and a field office at Chisapani were set up to manage the day to day work of the program.

Keeping the sustainability of the activities in mind, one main user committee and other five sub-committees namely agro-forestry sub-committee, disaster preparedness sub-committee, first-aid sub-committee, women and health sub-committee and construction and maintenance sub-committee of the community people were formed in the program areas. The members of these five sub-committees were trained to increase their skill to combat disaster at the local level.

Natural Disasters, Vulnerability and Livelihood Security in Nepal

Natural Disasters in Nepal are frequent claiming large numbers of human lives. Every year as much as ten per cent of the country's populations are affected by disasters. (Source: MOHA, 1999). Disasters, which strike so often, have implications for the overall development scenario of the country. Each catastrophe destroys years of infrastructure development and assets that have been accumulated by households. When the disasters strike the same region again, they push the population into a vicious cycle of deprivation, which is the cause of underdevelopment in many parts of Nepal. Because of Nepal's location characterised by rugged topography, variable climatic conditions and complex geological structure with active tectonic processes and continued seismic activities, the country is prone to various types of natural hazards. The whole country faces high levels of earthquake hazards: the hilly and mountainous regions are characterised by various watershed conditions and are vulnerable to landslide and debris flow hazards. In addition, other disasters such as drought, hailstorms, epidemic, and fire strike a smaller or larger part of the country almost every year. In the past Nepal has experienced these disasters many times resulting huge loss of lives, livelihoods and infrastructures. The earthquakes of 1934, 1980, 1988 and the floods of July 1993 are dominant examples of the natural disaster events, which caused considerable set backs to the development efforts of the country. (Dixit, 1994)

A superficial glance around a Nepalese rural village illustrates the pace at which rural Nepal is changing. The expansion of physical infrastructures, rural electrification, marketing and communication channels is creating a rural landscape that is increasingly urban in character, large concrete houses, the proliferation of consumer goods and associated services are some of the signs.

The traditional image of the peasant farmer sitting at the centre of the rural economy has long since disappeared from much of rural Nepal. The reality is that rural households are as likely to be involved in non-agricultural livelihoods as farming and increasingly draw their incomes from multiple sources. The non-agricultural sector is increasingly thriving on factors other than agricultural growth, including migration, urbanisation, infra-structural growth, and the impact of globalisation.

Agriculture continues to remain the hub of the rural economy but it has not been able to provide substantial livelihood gains for the rural poor. Non-agricultural livelihoods expand faster than agricultural livelihoods. So the poor may find themselves forced into a labour market, they have to move further a field in search of their livelihoods. In that case the migration (international/national) can be either permanent or temporary and in many locations agriculture is not the major source of household income. It is not unusual to come across villages where 70-80 per cent of the income is derived from outside the village. (LWF, 1998/99) On the other hand short-term gains in terms of money earned or assets acquired are all too often wiped-out by shocks and crises such as floods, erosion and health, or seasonal lack of labour opportunities. In this way by changing their practice in non-agricultural sectors the rural poor create the space for the possible future disasters.

Vulnerability

How vulnerability is defined and understood is one of the major academic queries of this twenty-first century. Vulnerability is widely expressed in scientific, social and economic languages these days.

Vulnerability affects everyone. Even well paid civil servants are vulnerable to losing their jobs and sliding into poverty. For the poor, and for the people just above the poverty line, vulnerability is a graver concern because any drop in income can push them into destitution. It describes the response to changes over time, resulting in the possibility of a decline in well-being. The event triggering the decline is often referred to as a shock, which can affect an individual (illness, death), a community, a region or even a nation (natural disaster, manmade disaster, and economic crisis). It measures the resilience against a shock - the likelihood that a shock will result in a decline in well-being. It is primarily a function of a household's asset endowment and insurance mechanisms and of the characteristics (severity, frequency) of the shock. (World Development Report 2000/01:139).

Vulnerability as the crucial issue was earlier identified by the Disaster Research Unit at the University of Bradford (e.g. Westgate and O'Keefe, 1976) and was continued in work at the University of Bath in Caribbean and Indonesian field research which showed vulnerability was created by decision makers (Jeffery, 1982).

Vulnerability accrues as a result of a change and therefore is a potential product of all activities and undertakings of society. Vulnerability reduction therefore requires a multi-sectoral and pervasive responsibility that can comprehend and identify those activities and undertakings and implement their redirection. So the project that targets to reduce the vulnerability of marginalized groups and communities of the rural areas always able to identify multi sectoral semi traditional practices using soft technologies.

National and Local Vulnerability

Vulnerability is a degree of susceptibility to a natural hazard. The concept of vulnerability is a significant contribution to our understanding of natural disasters (Baird et.al, 1975;Maskrey, 1989). It is the product of sets of prevailing conditions within which disasters may occur. The vulnerable state of populations and settlements is as much a contributor to the cause of natural disasters as are the physical phenomena with which they are associated. As showed in Table 1, physically and economically Nepal is vulnerable to different kinds of disasters. Consuming the natural resources of already fragile environment has provoked landslides and increased the severity of damage caused by earthquakes and flooding. In addition, repeatedly returning to vulnerable settlement sites after disaster occurrences has maintained the local susceptibility. The vulnerability to and provocation of disasters has shown a neglect of social, institutional and political responsibilities.

Table: 1 Some Important Indicators of Nepal.

| | |
|---|--|
| - | 34 percent of the total country expenditure is supplied by foreign aid. Overseas development funding finances 64 per cent of the development expenditures. |
| - | 85.2 percent of the population live in the rural areas where physical infrastructure is still undeveloped and/or highly underdeveloped. |
| - | 77 per cent of the total area of the country is hilly. |
| - | 81 per cent of the total labour force is engaged in agricultural activities. |
| - | Per capita GDP is estimated to be about US\$ 244 for the F/Y1999/00. |
| - | 40 to 71 per cent of the population live in absolute poverty. However, estimates and methods of calculation may vary. |
| - | The population growth rate is 2.37 per cent. |
| - | The infant mortality rate is 64.1 per thousand, which is amongst the highest in the world. |
| - | Nepal is one of only two countries where life expectancy for men is higher than that for women. |
| - | The ratio of population per medical doctor is 21,156:1 |
| - | The average literacy rate is 39.6 per cent, with a male literacy rate of 54.5 per cent and a female literacy rate of 25.1 per cent. |
| - | Two-thirds of all children in Nepal suffer from stunted growth. |

Source: Mitigation and Management of Floods in Nepal (2001), Page11, 12.

Vulnerability is compounded by the degree to which a community is at risk and to which socio-economic and political factors affect the community's resources, and on the personal and domestic level by defencelessness and inability to cope with risk, shocks and stress (Winchester, 1992). Events which may contribute to that inability may accrue over time as the result of a variety of external factors such as economy, loss of land or crops, ill-health, or the death of family members or working partners, all of which could be used by disasters as well as contribute to the overall effect of them. Thus, vulnerability as the condition of exposure to the initial impact and its immediate effects is only a part of the overall, pervasive and negative condition of vulnerability. (Lewis, 1999).

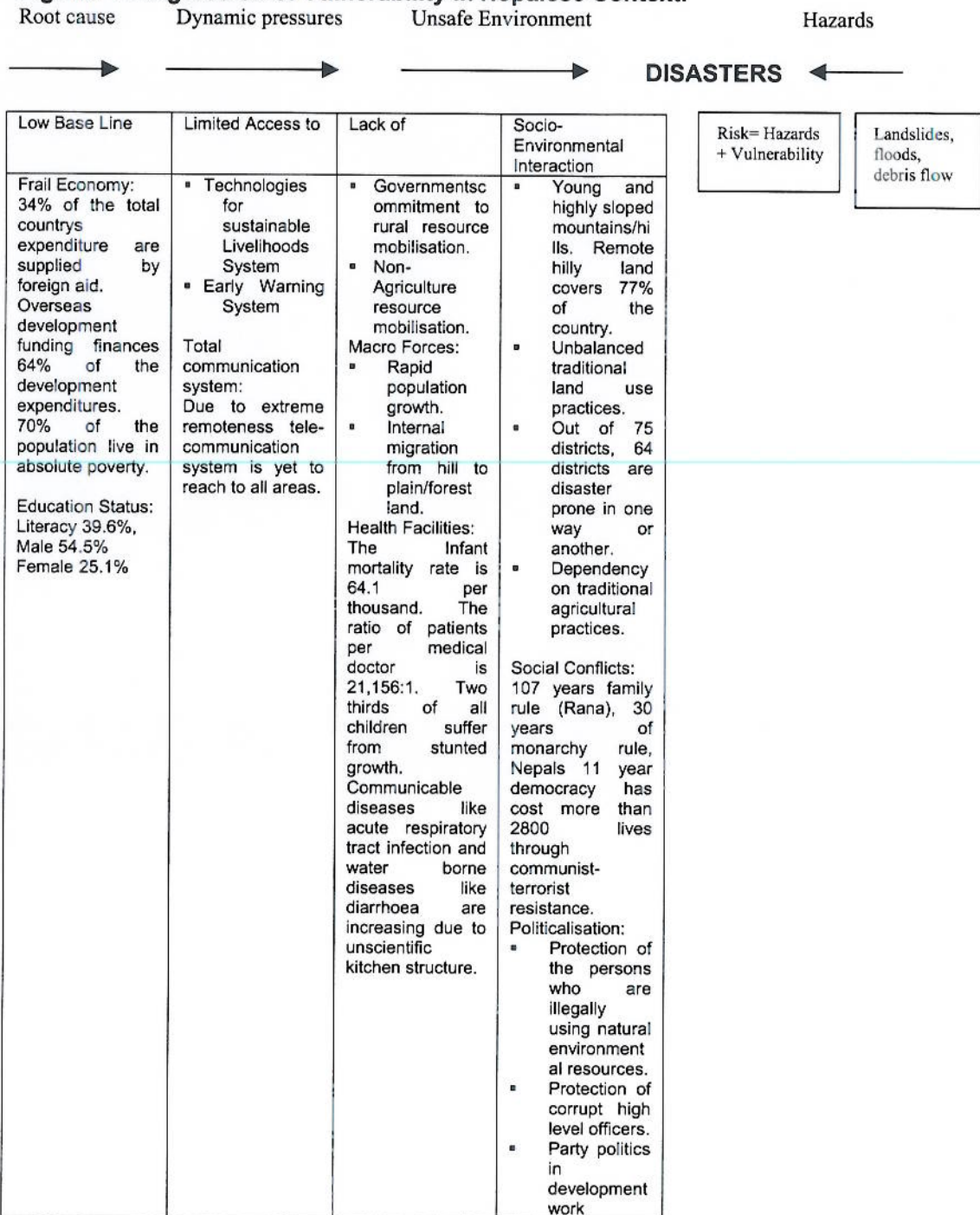
In the socio-economic context, vulnerability is usually defined in a manner such as following:

"A condition or set of conditions, which adversely affect people's ability to prepare for, withstand and /or respond to a hazard." (Warmington1995: 1)

Or, "Concerns the propensity of a society to experience substantial damage disruptions and casualties as a result of hazard."(OECD-DAC, 1994:8)

In recent years, different thoughts have gone into vulnerability, one might cite the "pressure and release" and "access" (PRA) models advanced by Blaikie, Cannon, Devis and Wisner that allow one to trace the "progression" of vulnerability by working back from the immediate to the root causes, and provide a framework for investigating vulnerable people's access to assets, income and other resources in society. (Blaikie et.al. 1994). Organisation like Duryog Nivaran in south Asia also has it's own framework or matrix for viewing vulnerability as the lack of security in four key areas: food, water, work and habitat. (Twigg&Bhatta, 1998)

Figure: 1 Progression of Vulnerability in Nepalese Context.



Source: Based on Blaike et al (1994)

Twigg (1998) argues that vulnerability is too complicated to be captured by models, frameworks and maps. There are so many dimensions to it: economic, social demographic, political and psychological. There are so many factors making people vulnerable, not just a range of immediate causes but - if one analyses the subject fully- a host of root causes emerge. There are no common measures or indicators of vulnerability. Because the investigations of vulnerability are investigations into the working of human society, and human societies are complex. They easily break out of any attempts to confine them within neatly drawn frameworks, categories and definitions. They are also

dynamic in a state of constant change, and because they are complex and diverse, all elements within societies are moving so that these changes occur in different parts of society in different ways at different times.

People who are living in a hilly country like Nepal cope with uncertain climatic conditions, which are leading to slow and rapid onset of disasters every year. Villagers' livelihood systems are designed with that threat in mind. They have developed skills to cope with such disasters and survive the hardships; they rehabilitate their houses, terraces and natural resource base, a task, which may continue for several years after the disaster. But Dahal (1996) points out that on the way to rehabilitation and struggle for survival many grass root-marginalized communities of disaster prone areas can't cope and are forced to abandon their ancestral homes. Others continue as long as they are able to do so.

Vulnerability and Coping Mechanisms (Resources and Capacities)

Long before the advent the technological age, disaster management, where it existed, was comprised primarily of indigenous mechanisms that were passed down over the generations. Marginalized communities had developed their own unique way of coping with the onslaught of nature. For example some of areas in Nepal, live elders whose ancestors have survived in these areas long before WE, disaster management scientists' (?), introduced disaster management strategies. In the plain Terai of Nepal the houses are made with wood, bamboo and straw. They use wood and dried animal dung for cooking fuel. In the dry season most of the houses are vulnerable to fire due to lack of proper safety in the kitchen. Earlier, every community used to have their own wells and ponds to protect them from possible fire disaster.

In recent times, modernisation has changed the coping mechanism of rural communities. With the coming of the technological age, some of the traditional practices have disappeared, some continue in their form till today, and some have merged with modern scientific and technical know-how and taken the form of unique local mechanisms to cope with natural calamities. On the other hand, completely new modern and scientific practices, that were never used earlier, have become an integral part of people's mechanism of coping with disasters. Whether traditional, modern, or a blend of both, all the coping mechanisms depend on the resources at disposal: people, the local climate and physiography, the administrative machinery in place, monetary resources, access to information and more. (India: IDNDR& beyond, 2000). In this respect, the traditional knowledge and practices of the marginalized communities have to be further evaluated, protected and integrated in the appropriate pre and post disaster management programmes.

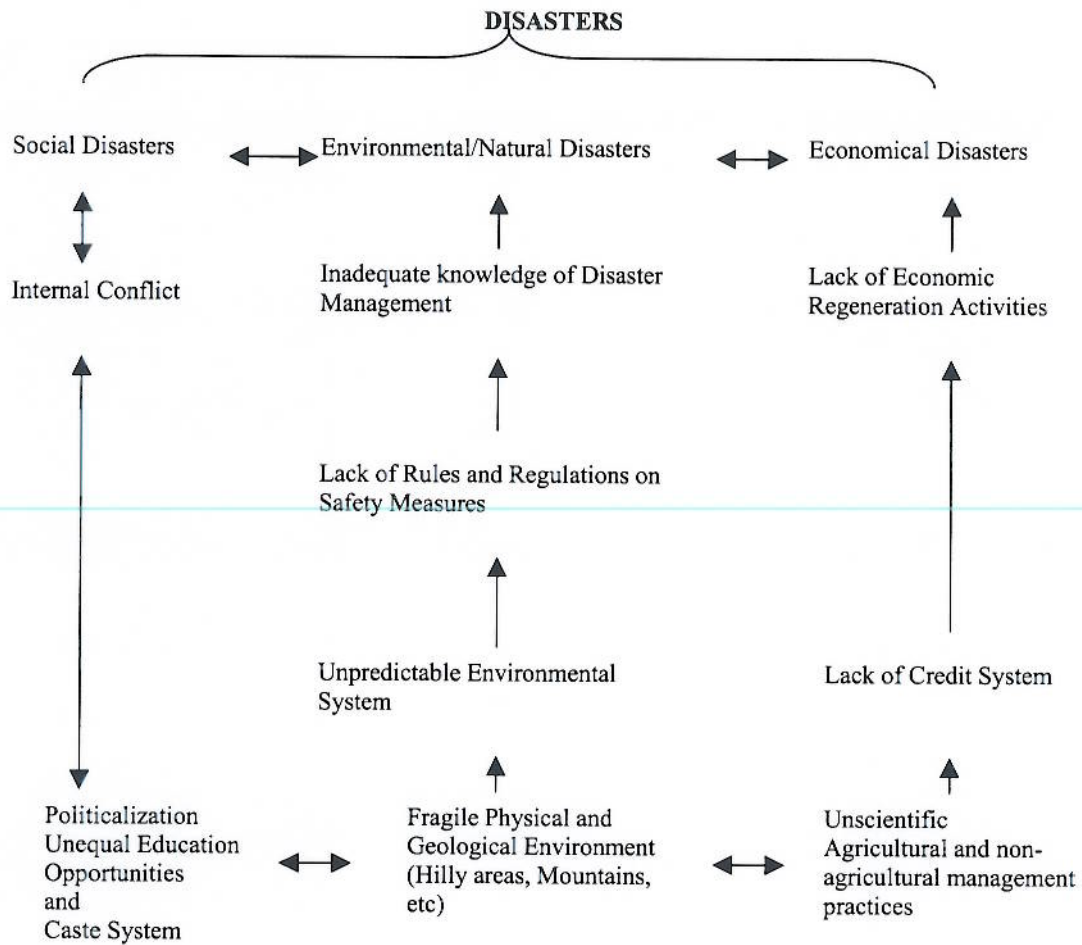
Livelihoods

According to Claude Gilbert (1998), the theoretical approaches to disasters can be classified into three paradigms. The first is disaster as a duplication of war (catastrophe can be imputed to an external agent; human communities are entities that react globally against an aggression). The second is disaster as an expression of social vulnerabilities (disaster is the result of underlying community logic, of an inward and social process). The third is disaster as an entrance into a state of uncertainty (disaster is tightly tied into the impossibility of defining real or supposed dangers, especially after the upsetting of the mental frameworks we use to know and understand reality.) Disaster is no longer experienced as a reaction; it can be seen as an action, a result, and more precisely, as the social consequence. Gilbert's main ideas might miss something fundamentally different about hazards in Nepal.

In the case of Nepal, disaster refers to a condition created by phenomena which have disturbed the living pattern and endangered the welfare of the population of a locality to the extent that it is beyond the local resources to return the situation to life as normal or at least to an acceptable standard within an acceptable period of time. Hence one distinguishes between local and national disasters.

Human activities are the prime cause of environmental degradation all over the world and are clearly the case in Nepal. The effect of human activities on environment may be direct or indirect, small or big, slow or fast, predictable or unpredictable depending on the nature, intensity or frequency of the disturbance to the natural ecosystem.

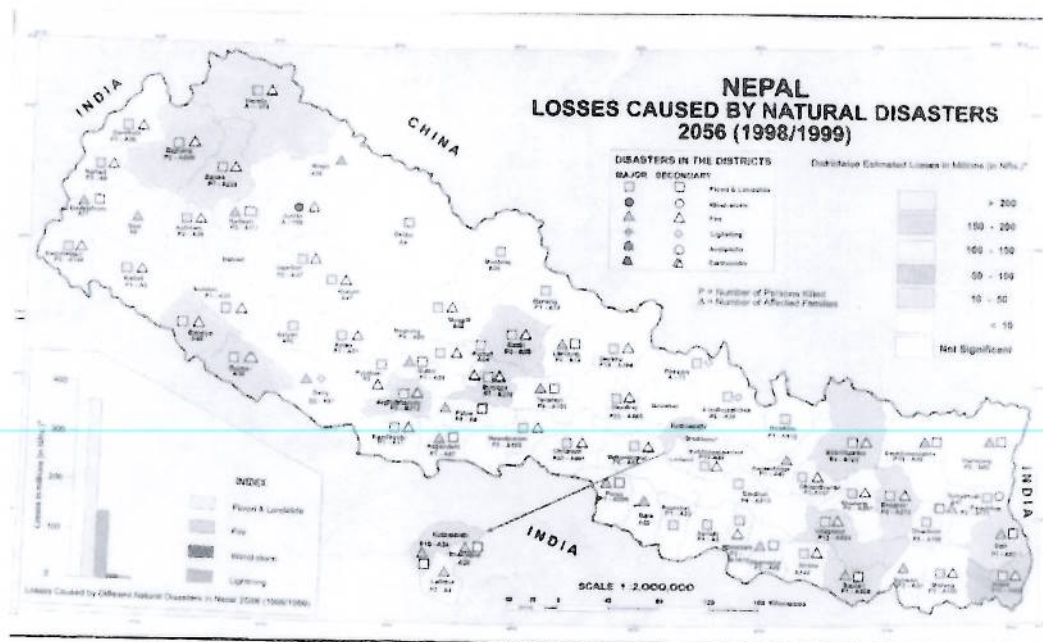
Figure 2: Disaster Problem Tree of Nepal.



The hill and mountains regions in which natural disasters are predominant accounts for the largest share (77 percent) of the land area of the country, characterised by a wide variation in topography, geology, soil, climate, flora and fauna and various ethnic groups having different socio-cultural traditions. (Dept. Soil Conservation/Nepal, 2000) All the major natural disasters that hit the country cause disruption in the socio-economic life of the people and bring misery with uncertainty. The ongoing human activities result in the recurring disasters of landslides and floods. Interference in the environmental system in the form of indiscriminate chopping down of trees disrupts the ecological balance thereby resulting in loosening of the soil and consequent soil erosion. Over a period of time the eroded soil begins to settle down on the riverbed resulting in the shifting of the river. This is one of the major reasons that the floods occur. (Poudyal, 2001). The Himalayan region, with soft and quickly weathering rocks covered with a thin layer of soil, is increasingly vulnerable to landslides causing disruption to urban and rural livelihoods in Nepal. Development of the communication system by means of road construction and mining of rich mineral reserves over a period of time has destroyed the dense natural evergreen forest cover. The unique geo-climatic conditions has made Nepal most vulnerable to natural / environmental and manmade disaster. Disaster occurs with amazing frequency and while the community at large has adapted itself to these regular occurrences, the economic and social costs continue to mount year after year.

Nepal is highly vulnerable to drought, floods, earthquakes, landslides, forest /bush fire, storm/hailstorm and avalanche. Of the 75 districts in the country, 49 are prone to floods/landslides, 23 are prone to fire (forest/bush) and one is prone to windstorm disasters. (PDMP/UNDP, 1998/99). Disaster Map of Nepal (Figure 3) clearly shows that a total of 64 out of 75 districts in the country are prone to disaster. The major types of natural as well as man made disaster are listed in Table 2.

Figure 3: Disaster Map of Nepal.



Source: PDMP/UNDP

Table: 2 Hazards of Nepal

| Types of Disaster | Prevalence |
|--|---|
| Natural Disasters | |
| Earthquake | All over the country |
| Flood | Middle Mountains and Terai Plain |
| Landslides | Mountain and Hilly Regions |
| Debris Flow and Glacier Lakes Outburst Floods (GLOF) | Higher Himalayas, Higher Mountains and Middle Mountains |
| Avalanche | Higher Himalayas |
| Forest/Bush Fire | Middle Mountains and Terai |
| Drought | All over the country |
| Storms/Hailstorm | Mountainous Parts |
| Man-Induced Disasters | |
| Epidemics | Mostly in Terai and some mountains |
| Fire | Terai and Urban Areas |
| Road/ Air traffic accidents | Urban Areas |
| Industrial/Technological | Urban /Industrial areas |
| Soil Erosion | Hilly and Mountainous Area |
| Social Disruptions (Terrorists/Anti-Democratic Movement) | Remote Far western /Western districts |

Source: Modified Dixit (1996)

Methodology

The methodology adapted for this research consisted of primary and secondary research. The secondary research took the form of a literature review, while the primary research involved undertaking a number of Informant Focused Interviews (IFIs) at fields in Nepal. Primary research was based on: i. the information received from informant focused formal and informal interviews with the marginalized grass root communities, government /NGOs officers and the professionals. ii. the information gathered from the silence visit (observation) in a project area at remote

location of Nepal. In the visit the researcher observed, listened and recorded (audio and video) the interaction of the marginalized grass root community members with on going disasters and a disaster management project. Key Informant Focused Interviews (IFI) was designed to understand the interviewees' perceptions of disasters and a disaster management project. It helped to the people and their views on disasters and a disaster management project rather than forced on directed discussion.

Major key informants were divided in three groups:

Group One: Officers, who are actively, engaged in development and disaster management related organisations in Nepal. More than twenty -five officers were contacted in Nepal. Most of them were based at Kathmandu doing the policy level work.

Group Two: The member of marginalized grass root communities of the field chosen. Nearly fifty interviews were taken in the field. Interviews were taken with women, men, elderly people and children of the community who actively participated in different components of a disaster management project.

Group Three: Various professionals and individuals who are directly and indirectly involved in disaster management and sustainable development in Nepal. Eight professionals and individuals from United Kingdom, United States, Japan, India and Nepal were contacted for this research.

According to Robson (1993) face to face informant focused interviews offer the possibility of modifying one's line of enquiry, following up interesting responses and investigating underlying motives in a way that other self-administered



and postal queries cannot. Non-verbal cues may give messages that help in understanding the verbal response, possibly changing or even, in extreme cases, reversing its meaning. Further, researcher believed it was more important to gain insight into the marginalized people's understanding of disasters and a disaster management project to get concrete conclusion.

Result

The whole evaluation process was expected to be very participatory, the analysis of the evaluation of the project is primarily based on the voices and perceptions of the major stakeholders: trained and untrained community, members of the sub committee, field level and Kathmandu based staff and policy makers represented in the project steering committee (PSC). Observations and physical variations are the supplementary basis for this analysis. The analysis is done keeping the project design (the log-frame) as a base to analyse within the four dimensions: relevancy, effectiveness, impact and sustainability.

The project was implemented within the given conditions, some of which have also become the limitations to make effective impact at the community level. The givens for the project implementers and policy makers:

- Time frame of two and half years,
- Broad framework for project design by the development study carried out by JICA,
- Project locations
- Choice of implementing agency
- Specific locations to build the infrastructure

The whole project design was based on the development study in which none of the persons responsible for execution of the project was involved. There was a readymade framework given by the development study in which the execution team had to work. The analysis, therefore, is done with the perspective to draw and document the lessons for replication with the dimensions of relevancy, effectiveness, impact and sustainability.

Within the given limitations and despite the compromises the project had to make because of the already-given conditions, there had been some remarkable achievements. Within the given time frame, the project had been able to build the infrastructures (two shelters, check dams, revetment, bioengineering works, and installation of rain gauge and bells).

Based on the results gathered from silence observation and face to face interviews it was clear that the project contributed to achieve other software outputs, such as increase in awareness towards disaster preparedness, health and sanitation education and disaster prevention through agro-forestry activities. The women, especially the women committee members, enhanced their ability to raise their voices. The project created some level of employment

opportunities for the community during that time. In spite of the time constraint, the project involved the community to a certain extent in its activities and processes.

Table No: 6 Evaluation Results Table of Chisapani Community Development & Disaster Management Project.

| Project Components | Relevancy | Effectiveness | Impact | Sustainability |
|--|-----------|---------------|--------|----------------|
| Disaster Preparedness & Prevention | + | + | ++ | - |
| Training | +++ | + | +++ | - |
| Income Generation | +++ | - | - | - |
| Hardware and Construction Components | +++ | +++ | +++ | + |
| Composition and Functioning of Subcommittees | ++ | - | - | - |
| Institutional Arrangements | + | - | - | - |

High Impact: +, No Impact: -.

NB: This table is formulated based on field visit and formal and informal interviews taken by the researcher.

Table No: 7 Results and Analysis with Different Elements of the Project

| Project Elements | Relevancy | | Impact | | Effectiveness | | Sustainability | |
|--|----------------|----|----------------|----|----------------|----|----------------|-----|
| | A | D | A | D | A | D | A | D |
| | In percentages | | In percentages | | In percentages | | In percentages | |
| Training | 60 | 40 | 30 | 70 | 10 | 90 | 0 | 100 |
| Income Generation | 55 | 45 | 2 | 98 | 1 | 99 | 0 | 100 |
| Hardware and Construction Components | 98 | 2 | 50 | 50 | 50 | 50 | 25 | 75 |
| Composition and Functioning of Subcommittees | 100 | 0 | 75 | 25 | 80 | 20 | 0 | 100 |
| Institutional Arrangements | 60 | 40 | 60 | 40 | 75 | 25 | 0 | 100 |
| Total Number of Respondents | 35/50 | | 42/50 | | 32/50 | | 48/50 | |

A= Agree, D=Disagree

NB: This table is formulated based on fifty households interviews taken by the researcher

Voices of the Vulnerables

- "We will run to safer places, but we have more chances of dying".
- "There is no place to run, if we go up it is dangerous, if we go down, it is more dangerous. Our path is cracking. We are all going to die."
- "There is no way that we will be able to reach the shelters, by then we will all be washed away."
- "In 1993, I climbed up to higher land, but now landslides are occurring on the roads, so I don't know where to go".
- "The shelters are stronger than our houses, but if it rains a lot, it will be washed away."
- "The check dams protects very few houses, it should have built to protect more houses."
- "I don't think we will be able to hear the bell when it is raining."
- "Who is going to bother ringing the bell when it rains so hard?"
- "We are surrounded by landslides; we have no place to run for safety."
- "We will run to the shelters."
- "Now at least there is a shelter for all of us to stay in unlike in 1993, when we had no where to go."
- "I rather stay at home than go to the shelter. (An old woman living near to the one of the shelters)."

- "We have to go to the shelters when there are landslides. (Children)"
- "The man who is given the responsibility to ring the bell is not given any incentive (money), so why will he bother ringing it, he will run to save his own life."
- "When disaster strikes, we will go to the shelters, but we are not sure how to prepare for it beforehand."
- "We can do nothing, it is beyond our control."
- "We came to know later that several training were given by the project but no one participated taught us anything after..."
- "We were given on the job training in construction, but we did not receive direct labour, a contractor was hired."
- "We will use the toilets and wash our hands afterwards." (Children)
- "We brought some potato seeds, but the harvest was same."

The above quotes demonstrate how the marginalized grass root communities in Nepal are still vulnerable to uncertainty relating of hazards. In terms of how do they confront disasters and how to they react to a disaster management project. The above mentioned quotes that they are mentally prepared to face disaster because they are grown up in such hazard prone areas but different events of disasters in the past.

DISCUSSION

Concerned by the increasing number and impact of disasters, the International Decade for Natural Reduction (IDNDR) was initiated in 1990 to serve as catalyst for disaster reduction. One of the most important gains of the International Decade for Natural Disaster Reduction (IDNDR) is the movement of policy investments from the concepts of hazards and disasters to the concepts of risk and vulnerability. This movement is important because first, it has brought the people –as victims, survivors, or vulnerable communities- into the centre and secondly, it has started integrating science and technology efforts with political –economy and social science considerations. (Bhatt, 1999)

The international community was altered to the fact that if we ever want to control and prevent disasters, we must be able to assess and identify vulnerabilities in order to design timely, affordable and effective strategies for reducing the negative effects of disasters. (Anderson, 1995)

Like in the other part of the world most disaster response agencies in Nepal now use the concept of vulnerability to analyse the various factors and processes underlying the impact of disasters on society. Most of the agencies further recognise that vulnerability and livelihood security are bigger concern for the poor, and that most vulnerable sectors in the society need special attention. This doesn't mean, however, that disaster agencies share a common understanding or definition of vulnerability. It is largely depends on the user and its role in society, what definition is acceptable and attached to vulnerability. During the flood and landslides in 1993, disasters paralysed central Nepal. The Nepalese government, international donors, environmentalists and local communities interpreted the causes of flood and landslides differently, and therefore their solutions to respond to the disasters also varied.

The majority of the Nepalese Government officials blamed for deforestation and unbalanced use of natural resources for the disaster. Government therefore, emphasised the need for better and new technology to predict monitor and address the disasters like flood and landslides.

International donors conducted widespread damage assessments, mainly locating the hotspots. Their interest was to estimate the impact on wildlife and natural resources. No one had collected any systematic field data of impacts on local marginalized communities, or investigated the cause of the disasters. It is nature that is most vulnerable in that case. People inhabiting the risk zone or areas are poor and degrade their environment in order to survive.

The NGOs and local community blamed the deforestation for floods and landslides as well as inequitable government natural resource utilisation policies. But on the ground poor farmers endured the hardship caused by the disaster like flood and landslides. They lost everything including their resources and life saving investments.

Local people's perception of vulnerability

"Hazards have always been part and parcel of the world's reality, and populations inhabiting hazard-prone areas adapted strategies to deal with extreme events, using their own capacities, skills, talents knowledge and

technologies. Learned from their ancestors and their own experiences, these adaptation strategies are made part of their traditions and culture" (Blolong, 1996:15). When the disasters strike, people have always been ready to cope and did not rely much on support and assistance from outsiders such as government.

Unfortunately, this picture is disappearing. "Political, demographic and global economic processes have put adaptation strategies under great pressures and given rise to vulnerability (and reproduction of vulnerability over time), affecting the allocation and distribution of resources between different groups of people." (Blaikie et al, 1994:24). The villagers of remote hilly areas of Nepal, affected by the landslides and floods in 1993, have lived for generations making their living from rural agricultural practices. For example in my study areas at Chisapani Village, potatoes, cauliflower and green beans are the major economic sources to sustain rural livelihoods. In times of disasters they have always had other resources to fall back on. With the arrival of multi farming strategies by project villagers tried to adapt different imported vegetables in the area, (although it did not successful later on...) competition for the land and forest resources intensified. But when the project ended rural villagers did not get easy market access for new crops—resulted in destruction of villagers' savings and their inability (traditional mechanism) to cope with extreme pressures in future disasters.

"In the fast changing hazardous environment, local people experience that traditional coping strategies are no longer valid or appropriate. They continuously look for new ways to adjust their livelihood strategies with the aim of reducing risk, sustaining their livelihood, and avoiding entering irreversible strategies that undermine the basis of their means of survival" (Walker, 1989; 50). Local people do not use the concept of 'vulnerability' to describe their worsening situation, they feel the stress, face difficulties, talk about 'risks', and make risk—taking or risk avoiding decisions. They do not only take into account the possible exposure to danger and future damages, but also their capacities, options and alternatives, and the implications of their decisions. It is important that outsiders understand both sides that make up local people's perception of risk, rather than analysing and measuring their vulnerability with outside criteria. Outsiders might level two households, who live in similar conditions, equally vulnerable. But the two households might still perceive risk differently and, as a consequence, prefer different risk reduction measures. Like in my field area Chisapani, Mrs. A and Mrs. B live within five minutes walking distance. At the time of disasters (landslides/floods), Mrs. A prefers to go to the one of the nearest shelters. According to her "the shelters are stronger than her house". But the Mrs. B prefers to climb to the higher places at the time of landslide disasters. She says "shelters have built in unsafe place, if it rains a lot it will be washed away".

My research area, village 'Chisapani', is the most hazardous place for landslides and floods in the Nepal with five major and six to eight minor landslides and floods since 1956 (According to Mr. C, 88, oldest person of the village). The major disasters happened in 1957, 1972, 1974, and in 1993, while threats occur almost yearly.

Living on the slopes of hilly areas in central Nepal gives marginalized farmers the opportunity to produce food, even without secure land titles. Although the Chisapani area is very active in landslide disaster, the simple fact of earning a livelihood increases the level of tolerable risk of being exposed to possible landslide and flood disasters. People only take actions at last period, when the highest alert level is reached. People do so because they know that their conditions will be worse when they when they evacuate to other place in advance. Villagers argue that more people die in the evacuated places because of poor conditions, than due to the immediate effects of the disruption. They say that in the past they did not receive any relief materials from the concerned agencies until a week time. So the benefits of each day's work on the farm near a landslides are perceived as less risky than the physical exposure to the actual landslide eruption, and being safe but hungry in the shifted places. This sentence supports the experiences of Mr. D, elderly of the village. According to Mr. D, in 1993 disaster they did not receive any relief materials and foods in shifted place for long time (seven nights). So they had to decide to go back to their destroyed houses and land areas to search for storage foods and grains to get relief from the hunger.

While governments put emphasis on expensive project to improve safety, and then on relief assistance, poor residents would have been better off, if the government with the help of multi donors, provided them with land security in nearest safer areas. They wouldn't need to farm on the landslides and floods slopes. In this case the political will of the Nepalese government to genuinely reduce disaster risk is lacking. To solve this problem Ministry of Emergency Management is needed urgently to address wide spectrum of disaster management and research issues in Nepal. The ministry should be made responsible to define the goals and targets of the disaster reduction programmes and researches for the each of the natural hazards faced by the country. Such ministry helps to prevent the duplication of false works (which is already proved at other places).

Information Technology in Vulnerability Reduction in Nepal

Similarly the use information technology will be the quicker solution to manage disaster and to reduce the vulnerability in disaster prone country like Nepal. The emergence of the information technology sectors in a big way in Nepal and neighbouring India has thrown open wide—ranging opportunities of its application in the field of disaster management. These can be at the levels of mass media application towards preparedness and mitigation, emergency communications during forecast, warning and emergency phases.

In Nepal FM /Community radio is getting popularity rapidly. The radio set, which had almost become a forgotten thing after the advent of television, has now reemerged as everyone's friend regardless of age, interest and profession. Whenever any thing new happens the first thing people do is zap through all the FM/community stations for the news coverage. In 1993, the National Broadcasting Act was introduced to regulate the FM Community broadcasting sector. In a short period of six years 25 FM Community radio stations have sought and acquired permission from the Ministry of Information & Communication. Out of 25, 18 are stations outside the valley 13 of these are in operation with different local languages. The remaining three is in trial phase. FM Community radios have become a boon for those who don't read or write and don't have access to newspapers as they provide information related to agriculture, health, local and national disaster and variety of others. The talk programs on FM community radios stations have

become very popular. It is mostly high government officials and officials from public utilities who participate in such programming. Since the format is live and the general public can phone in, the stations have become a good platform for interaction between the government and public. So at present context FM community radio may be the best way to reach to the local people with any early warning system effectively.

GIS Use

Despite the growing interest and proliferation of Geographical Information System, it has not yet been used for disaster management processes. The use of GIS in concerned national and international agencies helps for the regional livelihood security. For example, in Nepal most of the disasters take place during the monsoon, which is directly related to climatic conditions. These days climatic conditions can be forecasted by using GIS technology. In this way to protect the lives and livelihoods GIS can be used as early warning tool in the country like Nepal.

To Develop Traditional Knowledge Base

Numerous communities, especially those who have been periodically exposed to hazards such as landslides, floods have over the ages evolved their own traditional systems of advanced warning.

An impressive machinery comprising sophisticated tools and techniques are at hand to prevent, forecast, monitor, map and track potential /developing /existing disaster situations, to supply relief and undertake rehabilitation programmes. Despite these measures, statistics indicate that losses due to disasters are on the raise and that more and more people continue to be affected by the disaster each year. That is to say, communities are increasingly vulnerable to disasters today. And on the other hand more and more people continue to live in these high –risk zones.

A major resource that has so far been left totally unexplored and unexploited is the local population, their needs and knowledge that exist in the form of traditional practices indigenous to each region. People have been vulnerable for centuries and in an earlier age when technology has not reached the heights it have today; indigenous mechanisms were evolved and used for dealing with natural hazards. For example, abnormal behaviour of local animals and plants and changes in weather patterns were used as signs that a hazard was imminent. Houses were built specially tailored to the local conditions. The literatures of many Nepalese and Indian languages are rich in verses and proverbs that deal with imminent natural hazards. While their scientific basis has not really been established, instances of their efficiency and use can be seen even today. Again there have been examples of how traditionally built structures have emerged from landslides, earthquakes floods and cyclones unscathed whereas more contemporary structures have been totally destroyed. There is also an increasingly vocal support for movements that argue about how a departure from the original customary practices has aggrandised the impact of natural hazards. There are opportunities in revisiting these traditional practices and devising means on how these could be replicated and publicised to reach and benefit a larger population.

Training and Education

If mitigation is to be successful, its requirements must be widely known and understood. Therefore, there is a need to train and educate all those involved, including disaster management officials, construction specialists and general public. In this regard, public awareness programmes can provide an important foundation by informing people generally of the need for and benefits of mitigation programs. In a more specific sense programmes of training and education are necessary to ensure that mitigation programmes will be supported and properly implemented. Four target groups are especially important in the case of Nepal.

- Public officials
- Technical students
- Small builders and craftsmen
- School children

The level and type of training needs to be tailored to the needs and capacity of the various groups. For the district level officials need special inputs on early dissemination of warning to the community and on measures to be undertaken for emergency relief and pre disaster preparedness. A valuable input would be in understanding the vulnerability of the community as it varies widely based on socio-economic capacity and proneness to hazards. The district level officers also need to recognise and be able to replicate the traditional practices followed by the communities to counter natural hazards.

Officials at the state level need to be oriented on long-term measures such as rehabilitation programmes and developing local and regional networks for flow of research based ideas and experiences for implementation. More importantly, officials in the various departments need to understand the vital link between disaster management and development.

Public Awareness

In addition to general awareness, certain particular areas of public involvement are necessary for effective implementation of mitigation programs. These include:

- A good public knowledge and understanding of local hazards and vulnerabilities.
- Public awareness of the kind of mitigation measures that can be applied.
- Public participation in preparedness programs.

Government or national council can substantially assist public awareness of safe mitigation practices by ensuring that their own public buildings especially schools, dispensaries community centres are built to high safety standards. These could serve as valuable demonstration centres.

CONCLUSIONS

Not only in Nepal, natural disasters happen almost all over the world all of a sudden causing heavy loss of human life, and livelihoods. Usually natural disasters cannot be stopped. However, the magnitude of disasters can be reduced if preventive measures were taken in due time for which pragmatic government policies and public awareness are of utmost importance. This is especially true if the government; community and the people, civic societies work together to this end. The effects of natural disasters have shown the necessity to intensify international cooperation for disaster mitigation to protect the lives and livelihoods of thousands and thousands of vulnerable peoples. The frequency and severity of natural disasters have increased in recent years, and those trends are expected to continue well into future in a country like Nepal.

This research looked at a disaster management project that was focused on both hazard mitigation and vulnerability reduction involving vulnerable people in the whole process. Hardware, not software input have been seen as more relevant and effective in relation to those input. This is software including the training is regarded as less suitable. One explanation for this is that income generation opportunity, which required changes in traditional land use practices eroded livelihood opportunity and did not encourage security through saving.

The limited potential land resources of Nepal should be protected from the ravages of floods and landslides. To redress the sufferings and social disruption of the people and to provide security for appropriate economic activities in hazards prone areas, it is urgently needed to reduce the loss of lives and damage to properties due to floods and landslides. Local people have knowledge about their locality, the history of disasters in their place, and how vulnerability to disaster has changed over time. They have the right to participate in decisions that affect their lives directly. Local people's participation is basic, because safety, stability of livelihood, well being and disaster management is their concern, not solely that of experts such as government, scientists and aid agencies. This will also serve to bring the traditional knowledge and the expert knowledge to interact with each other more in terms of the needs and priorities of local community. Disaster planning and management cannot be explicitly tailored for the rural marginalized communities in a sectoral manner, rather these will need to be internalized in a holistic manner into their frames of reference and not those of experts from outside.

On close monitoring of CCDDMP, this research indicates that some aspects of disaster preparedness and management are already embodied consciously or sub-consciously into various cultural practices that are carried for generations. Such traditional knowledge or cultural practices of the marginalized grass root communities needs to be integrated in pre and post disaster management activities. Relevant scientific and expert knowledge, though, is still necessary, especially regarding rare and new types of (human-made) hazards. Such an example is that of SARS: natural in origin, but thought to be induced by human factors, or by close "contaminated human and animal interaction" in vulnerable communities. Public awareness, using scientific data in a popular manner, is an important risk reduction measure that can positively influence actions of communities at risk. In turn, we should hear and recognize the values of marginalized people's perceptions, which are at risk. In the country like Nepal it helps to lead the formation of new local institutions or to the strengthening of existing ones for vulnerability reduction and livelihood security at local level. (Heijmans, 2001)

In spite of enough being said in theoretical circles the project showed very reactive approach towards managing disaster in Chisapani. It tried to respond visible affects of disasters without undertaking a deep probe into the underlying causes that create conditions for the disaster in the first place. While we stress the importance of addressing the underlying causes, we should be careful to note that the cause and effect relationships are not linear and deductive and cannot be reduced to simple explanatory models. Rather these are governed by complex inter-relationships that are deeply embedded in the local context determined by existing paradigmatic base for the development. This development determines the existing policies for disaster management, existing institutional management and cultural beliefs and practices. The underlying causes are not root causes in that sense, since there is no single starting point (root) for disaster in the vulnerable rural areas like Chisapani in Nepal.

On the other hand, the fragile environment of the country should be preserved through the conservation of natural watershed and riverine resources together with the sustainable development of water resources. Research and development activities should also be carried out at the same time for the development of inland and trans boundary waterways. Poverty alleviation should be supported by creating a suitable environment through structural intervention and regulatory measures to increase economic activities in the disasters (floods/landslides) prone areas. In order to attain the above objectives, firm political commitment with due integrity and determination is an indispensable precondition for better disaster management in Nepal.

Additionally, in view of the complexities and diversities of disaster management in Nepal, a concrete, effective and practicable policy is needed, which facilitates the integration of rural indigenous or traditional coping mechanism into modern disaster management and development work. For this political commitment and a pragmatic policy formulation is necessary in order to reduce the natural hazard risk faced by vulnerable people of Nepal.

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