Disaster Risks and Community Response: A Case Study from Ilam, Nepal

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Introduction

- Nepal is prone to a variety of recurring natural disasters such as floods, landslides, snow avalanches, Glacial Lake Outburst Floods (GLOF), hailstorms, thunderstorms, cold waves, hot waves, drought, epidemics and earthquake.
- Out of the 75 districts in the country, 49 are prone to floods and/or landslides, 23 to wildfires, and one to windstorms. A total of 64 out of 75 districts are prone to disasters of some type (MOHA, 2009).

Introduction Cont..

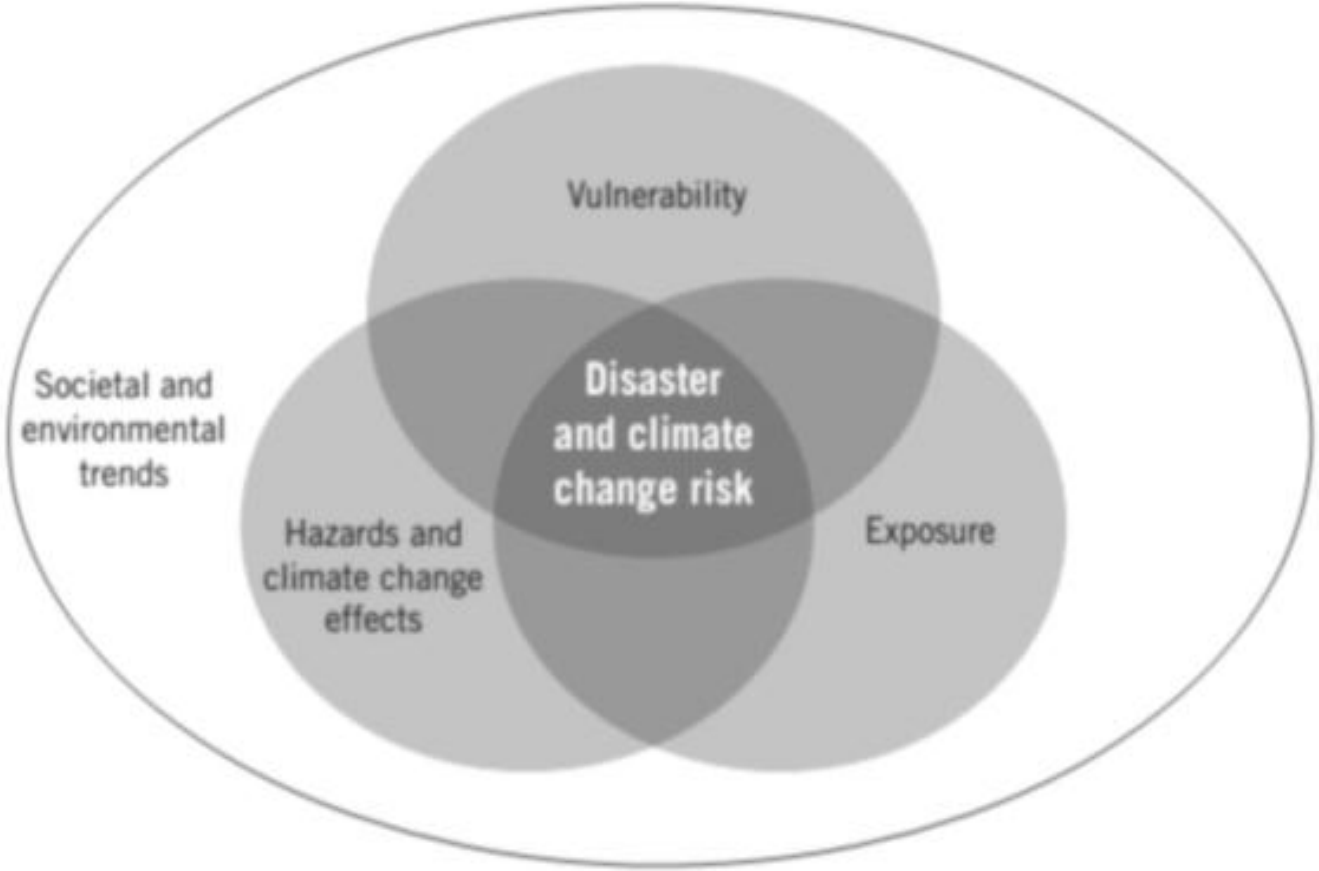

Figure 1. Disaster and climate change risk (Source: Toward Resilience: A Guide to Disaster Risk Reduction and Climate Change Adaptation)

Materials and methods

Study area

- Research was carried out on farmers, residing around the Ilam Municipality with associated disaster prone area, were the target population for the study. Especially residents on the 6 (former) VDC's of Ilam District Nepal i.e., Kanyam, Chulachuli, Bhanjyang, Godhak, Namsaling and Sangrumba. (time?)

Sample size:

- Altogether 300 respondents were selected by applying simple random sampling method with multiple responses.

Materials and methods Cont..

- **Nature of data**
- **Primary data**
  Participatory Rural Appraisal tools as focus group discussion, key informant's interview, transect walk, timeline, and community consultation and household survey
- **Secondary data**
  Publications like journals, research articles, proceedings of Governmental Organizations and Non- Governmental Organizations.

Materials and methods Cont..

- **Data processing**
  Data analysis was done using a SPSS and MS Excel.

Results and discussion

1.Change in the climatic condition

Climate changes	Percent (Multiple response)
Change in Weather	99
Increase in Temperature	92.3
Change in Rainfall Pattern	88
Change in Windstorm	65.3
Change in pattern of Drought	56
Decrease in Hailstone	53.7
Decreasing Erratic Rainfall	48.7
Increasing Erratic Rainfall	31
Change in Pattern of Hailstone	29.3
Decrease in fog	28
Increase in fog	23.7
Increase in Hailstone	12.3
Decrease in Temperature	9.3

Table 1. Change in the climatic condition of Ilam, Nepal, 2013

Results and discussion Cont..

1.Change in the climatic condition

- Respondents told that, winter has become colder and some supported that winter has become milder.
- It can be said that climate extremes have increased from the perceptions and multiple responses of respondents as 99% respondents respond that the weather is changing.
- Increasing trend of temperature rise and precipitation extremes have been observed in Nepal along with the incidences of heavy precipitation at many cases that ultimately leads to the disaster.
- However, according to available data on temperature from Ilam and Kanyam stations, very little change in average annual temperature (both max and min) has changed and information on rainfall is inconsistent between stations.

Results and discussion Cont..

2. Major climatic hazards

Table 2. Timeline of the climatic hazards (According to Nepalese solar system calendar bikram sambat)

Place	Events	Consequences
Godhak	Landslides (2045) Flood (2030, 2045, 2053, 2064) Drought (2034-35) Hailstone (2030 and 2064-65) Insect Pest (2052-53) Snow fall (2002)	12 household washed away, Loss of Cardamom field, Drought effects on Maize No cardamom Production since from 3 years Death of Fish lives Problems of rhizome rot, whitefly, Extinction of buckwheat, Horse gram and mustard Replacement of local breed cow Jure with Holstein and Jersey Arrival of new variety i.e. Tomato, Cow pea Squash and Pumpkin Extinction of Jackal and porcupine, Rupi and Crow and increment in Rabbit and Monkey Increment of Variegata acranthus 10-15 years ago, there was a problem of dew

Results and discussion Cont..

2. Major climatic hazards

Kanyam	**Flood (2090, 2011, 2025, 2069)** **Drought (2028)** **Insect pests** **Hailstone** **Snow fall (2028, 2033-34)** **Hurricanes (2066)** **Dew (2068-69)**	**Loss of human lives and livestock** **4 household migrated** **Washed away of mini bus carrying 14 people** **Washed away of cardamom and broom grass land** **No production of maize** **Replacement of indigenous crop with hybrid variety** **Extinction of Fox and Jackal since from 15 years and increment in rabbit** **Problems of aphid and mosquito since from 2 years** **Problems of rhizome rot** **Destruction of leach** **1 man death due to hurricanes**

Results and discussion Cont..

2. Major climatic hazards

Bhanjyang	**Landslides** **Heavy Rainfall** **Hailstone** **Drought** **Frost** **Outbreak of new diseases**	**Landslides occur 45 years ago, which took away life of 7 people and washed away Nigure village.** **People recall that the size of the raindrop was so high that it made holes on roads and several other places. The rainfall was unexpected and strange; it occurred only in about 50 meters diameter** **12-13 years ago in the month of the Mangsir (Nov-Dec) shattered rice grain, causing more than 80% crop loss.** **Normal period for hailstone is Chaitra (March)-Baisakh (April)** **Liver fluke didn't exist in the past, but now it has become very common and sudden death of healthy-looking goats**

Results and discussion Cont..

2. Major climatic hazards

Chulachuli	Flood (2036, 2048, 2070) Problems of snake Drought (2035, 2053,2069) Hurricane (2036) Increment in Wild elephant behavior Fire Epidemic of diseases Malaria (1932)	2 people died due to flood On 2044 B.S. several households migrated At the time of paddy cultivation drought creates problem i.e. loss in productivity (1.5 man/ Bigha) and 1 people injured due to the snake bite Several people died due to the malaria Agriculture land washed away Problems in moving because of destruction of check dam

Results and discussion Cont..

2. Major climatic hazards

Sangrumba	**Landslides (2021, 2025, 2067 and 2069)** **Flood (2025)** **Hurricanes (2066)** **Fire (2054)** **Earthquake (1990 and 2068)**	**Extinction of Ducks** **16 person died due to landslides and loss on 4 means of transportation** **Loss in crop productivity** **1 person died due to fire and in 1 household loss of property around 7 lakhs** **Problem of hurricanes on 44 households and schools** **Loss in 11 households due to earthquake**

Results and discussion Cont..

2. Major climatic hazards

- One of main reasons for the high level of vulnerability is the geology.
- Second, population is growing, which is increasing pressure of people on forests and farms.

Results and discussion Cont..

3. Major causes of climate change and disasters

Table.3 Major causes of changing environment

Changes in Environment	Percent
Deforestation	94.3
Human Behavior	89.7
Uncontrolled Population	71.3
Climate Change	54
Urbanization	29.7

Results and discussion Cont..

4. Impacts of Disasters

Table 4. General impact of Disasters

Impacts	Percent
Infestation of insect pest	97.7
Drying of water resources	93.7
Decrease in productivity	89.7
Increase in D/s infestation in crop	72.7
Increase in D/s infestation in Animals	62.3
Invasion of new crop	66
Early maturity	42.7
Flowering in forest	20.3
D/s in human beings	36.7
Increase in productivity	8.3

Results and discussion Cont..

4. Impacts of Disasters Cont..

Table 5. Impact in agriculture, livestock and economy

Impacts in Agriculture	Percent of Cases
Decrease in Productivity	92.5
Increase in Insect Pest Infestation	87.5
Agriculture land washed away	60
Effects on Livestock	
Decrease in Productivity	83.30
Loss of Fodder and Forages	77.80
Reduce in Productivity of livestock	53.60
Diseases	38.60
Livestock washed away	2.40
Impacts in Economic Resources	
Low in Productivity	95.6
Reduction in income	88.2
Disease	32.1
Starvation	4.4

Results and discussion Cont..

5. Effects in Environment due to these disasters

Table 6. Disaster effects in Environment

Effects in Environment	Percent of Cases
Decrease in Surface Water	94.6
Pollution	74.2
Loss in Biodiversity	50.3
Loss of Lives	6

Results and discussion Cont..

6. Local mitigation methods

Table 7. Mitigation Methods used by respondents

Mitigation methods for landslide	Percent of cases
Afforestation	97.7
Contour Farming	78.9
Awareness	51.6
Check Basin	48.4
Change of Place of House	11.7
Reconstruction of Shed	3.1
Loan for household activity	3.1

Results and discussion Cont..

6. Local mitigation methods cont..

Mitigation methods for flood	
Check basin	92.9
Awareness	92
Loan for household activity	13.3
Change of place of house	7.1
Reconstruction of shed	5.3
Mitigation methods for drought	
Conservation and Utilization of Resources	89.6
Drought Resistant Variety	40.7
Construction of Plastic Pond	8.6

Social Network

- Social network is a social structure made up of a set of social actors (such as individuals or organizations) and a set of the dyadic ties between these actors.
- According to respondents major sources of the information they got are Radio, TV and also from relatives, neighbors and friends.

Social network contd..

Help Others	Percent in Cases
Helping hands	77.4
Information	61.6
Giving basic needs	48.4
Loan	18.3

Table. 8 Respondents helped each other through different means

Conclusion and recommendation

- Climate is changing and leading to different natural hazards.
- People are using their indigenous knowledge and technology to cope with these disasters.
- Vulnerability and resilience have mutually dependent effect on the communities coping with different situations.
- The best possible outcome of decreasing people’s dependence on outside resources and assistance is that it might lead to better stability of the district.
- New interventions such as rainwater harvesting ,crop nutrients conservation farming, promotion of drought tolerant crop ,crop diversification and communal gardening can be done for mitigation and adaptation measures ensuring the sustainable livelihood.