Patan Pragya *(Volume: 5 Number: 1 Sept. 2019)*

Received Date: July 2019 Revised: Augest 2019 Accepted: Sept. 2019

Practices and Status of Preparedness of Vulnerable Household in Diaster Management in Disaster Prone Hill Areas of Nepal

Bistha, Raghu Bir (PhD)*

Abstract

Preparedness is called wisdom to reduce disaster risk and its undesired economic loss. It saves to 4 USD, if 1 USD is allocated on preparedness to disaster risk reduction (DRR). Therefore, DRR is considered an effective measure to improve preparedness. This paper examines practices and status of preparedness of vulnerable household in disaster management in disaster prone hill areas of Nepal based on primary data collected household survey of the study area of Sot Khola Catchment Areas: Gadhi, Lekhagaon and Kunathari by using descriptive statistics under explorative and descriptive research design. Its result is existing indigenous knowledge, skill and practices as preparedness measures. Almost households have preferred to move safe place as key preparedness measure of households because of their indigenous knowledge, skill and practice. Its effectiveness is more than other options. Therefore, Nepal as a disaster-prone country has to focus specifically on preparedness from local government to the central government for saving life and economic loss.

Keywords: *vulnerable household, preparedness, disaster management and disaster prone hills*

1. Introduction

Disaster risk is everywhere in the world. Its extremity level depends on household's adaptative capacity and vulnerability level. In developing countries, its level is unexpectedly maximum and intolerable disastrous towards higher vulnerable and need of resource and time to recovery and rehabilitation but in developed countries, its level is minimum, tolerable and manageable towards quick reco

very and rehabilitation. In 2015, Nepal lost 700 USD equivalent physical infrastructure (asset, house and public utilities) and more than 8900 population (child, women and old age) (WB, 2015). In Chili, similar 8.3 rector scale earthquake was not so much disasters in 2019. It just killed 8 people (www.telegraph.co.uk) after evacuating millions of people. In June 18, 2019, 6.7 rector scale earthquake struck Yamagata, Japan with 26 injured disaster cost (www.scmp.com/news). This disaster risk difference between developed countries (Japan

*Mr. Bista is an Associate Professor, Department of Economic, Patan Multiple Campus, T.U., Patan Doka.

and Chile) and developing countries (Nepal) is the effective implementation of Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM) approach. Therefore, DRR and DRM are vibrant important approach to avoid disaster risk as much as possible and to be safe.

Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM) approaches argue the role of disaster risk reduction by reducing potential disaster loss of lives, tangible and non-tangible assets, livestock and physical infrastructure. DRR approach specifically focus on preparedness and resilience in pre disaster time but DRM that talks whole cycle of disaster management considers it as first phase of four stages cycles: preparedness, response, recovery and mitigation. Both approaches conclude preparedness and resilience as best tools to minimize disaster risk and vulnerabilities in the community for achievement of sustainable development goals. These approaches have a backdrop of international scientific and academic discourse and interaction in the Second World Conference on Disaster Reduction in Kobe, Hyogo, Japan in 2005. Such discourse has promoted internationally Building the Resilience of Nations and Communities in Disasters as Hyogo Framework for Action (HFA). In 2015, the Sendai Framework for Disaster Risk Reduction 2015-2030 is the first major agreement of the post 2015 development agenda with seven targets and four priorities for action. It was endorsed by the UN General Assembly following the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR). Thus, Disaster Risk Reduction approach is being widely endorsed to focus more on preparedness and resilience.

This approach is endorsed in the post 2015 DRM Regulatory Framework in Nepal, the National DRR Policy and Strategic Action Plan for Nepal (2017-2030) and National Disaster Management Act 2017. Its reflection can be found in the establishment of National Reconstruction Authority (NRA) and in the integrity with national, provincial and local government development policy framework and budgetary allocation. In 2015, there was 2975 hazard events (boat capsize, earthquake, epidemic, fire, flood, landslide, heavy rainfall, windstorm, lighting, drowning, high altitude and others) having 7.09 trillion Nepali Rupees (70.9 million USD), although there was DRR options. Except earthquake, Nepal has lost per annum more than 2 billion Nepali Rupees (20.0 million USD). This disaster scenario is made complicated by the vulnerable population. Bista (2019) notes disaster contributing 2 percent poverty and inequality towards extreme vulnerability. In future, disaster risk will be unaccountable in this disaster-prone country, Nepal, if Nepal ignores DRR, particularly preparedness and resilience. A handful scientific literatures (Tuladhar et al., 2015 and Maharjan and Shrestha, 2017) focus on DRR, particularly preparedness and resilience. Thus, preparedness and resilience are highly relevant to further academic and scientific work.

2. Objectives

This paper examines practices and status of preparedness of vulnerable household in disaster management in disaster prone hill areas of Nepal. Its specific objectives are to identify preparedness options of households in pre climate risk and disasters, to assess household preference, choice and behavior to select the preparedness options and to assess the effectiveness of household preparedness and their choice in pre climate risk and disasters.

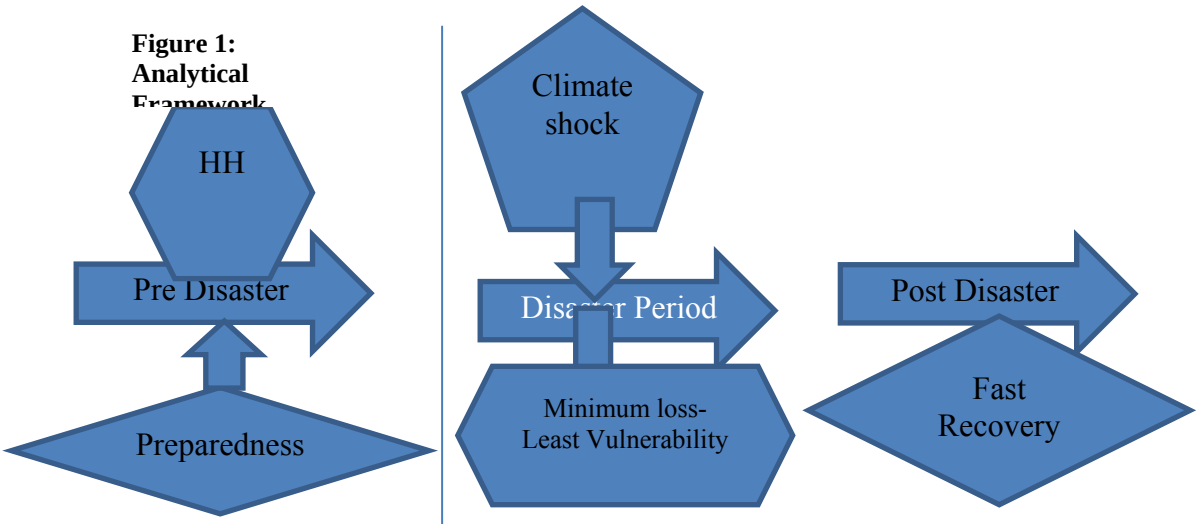
3. Methods

This section contends analytical framework, Study Area, Data and Data Collection Method as follows.

3.1. Analytical Framework

Based on assumption that household has resilience capacity in the indigenous form, nature and practice, households-high- and low-income group have resilience behavior determined by household choice and preference in the pre disaster. Such behavior to preparedness has negative relationship with climate shock and its disaster spread and cost (Figure 3). Therefore, preparedness is considered a best tool to avoid and minimize climate shock and its disaster cost.

Figure 1: Analytical Framework



Based on such theoretical approach, policy action at household level in accordance with vulnerability level and multiple natural hazards map is oriented at national and local level, along with Non-Government Organization (NGO). Therefore, it is analytical framework of this paper to analyze household behavior- choices and preferences on preparedness options in the pre climate disaster.

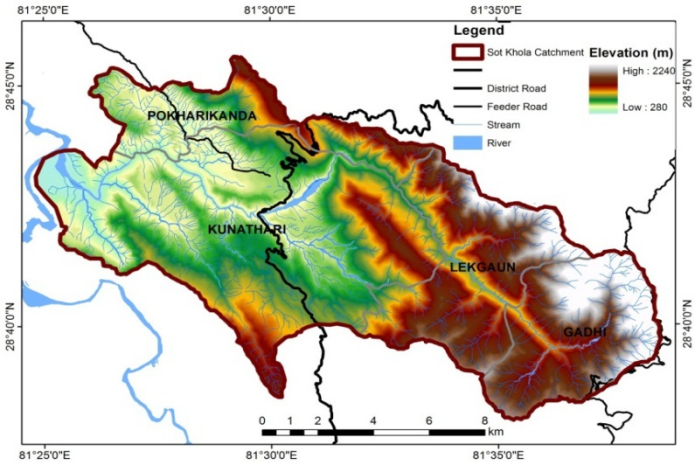
3.2. Study Area

This paper assesses above objective to understand household preparedness in Sotkhola Water Basin Catchment areas (Gadhi, Lekhagaon and Kunathari VDCs) in the northern hill

area of Surkhet, Nepal. Its selection motivation was climate variation, flood and landslide disaster and its huge damage cost in 2014, along with the occurrence of higher vulnerability in the catchment areas and household and morphological structure and agricultural loss and risk.

Sotkhola Water Basin Catchment Areas including Gadhi, Lekhagaon and Kunathari spread in the corridor of Sotkhola stream. As a tributary of a big river, Bheri (Figure 1), the stream with 30 km length originate from Chandane, Gadhi VDC and ends to Rakseni, Kunathari VDC (Figure 4) (DDC, 2015). Like as rivers originated from Tibetan plateaus, its nature is permanent with a good water level in both seasons: summer and winter seasons. In summer season, its water level is higher than in winter season. In winter, its water level is unexpectedly lower. Thus, the river is a monsoon lover. This water basin is a source of clean drinking water, irrigation water and water and terrestrial ecosystems to the catchment households.

Figure 2: Sotkhola and its catchment study Area



Source: GIS map of Study area based on field survey, 2015

Geomorphological of the three catchment areas having 28 km^2 spread from the sea level to the Mahabharata range: Gadhi VDC (Upper stream), Lekhagaon VDC (Middle stream) and Kunathari VDC (Downstream) (DDC, 2015). Gadhi VDC is the upper catchment landscape located in hill and mountain. Its geomorphological character is naturally heterogeneous and diverse. Demographically, population size is about 3369 (VDC, 2015). b) Lekhgaon village spreads 110 km length and 30 km breadth of 2451 square km (249016 hectare) from 198 meter (Tata pani) to 2369-meter (Matela gurase) altitude (Figure 1). Hill with 84 percent dominates to 16 percent valley. Population size is 3999 (651 households) (DDC, 2015). c) Kunathari is another study village lying between 600 meters and 1200 meter (Figure 1). It is 20 km far from district headquarter). Population size is 3413 (CBS, 1991) and (DDC, 2015).

3.3. Data sets and Data collection method

Data sets of this paper are secondary data relating to natural disasters and household vulnerability is collected from District Development Committee (DDC) office as well as from Ministry of Home. As complimentary, primary data is used to household socio

economic information are collected from UNDP's Household Survey conducted in the post natural disasters in 2014 during from September 2015 to October 2015 to collect reliable and accurate data and information about climatic events and disasters and its vulnerability to install hydrological monitoring system, alert system, infrastructure and building adaptation capacity.

Household survey is a main data collection tool, along with Key Informant Interview (KII). The survey was designed into two stage sampling method. Nine clusters based on altitude, location and place is selected by using cluster sampling method covering 3310 households over the catchment areas: Gadhi, Lekhagaon and Kunathari. Out of nine clusters, 642 household samples (19.3%) was randomly selected by using random sampling method. Structural Questionnaire was a tool of household survey to survey 642 sample households to collect about socio economic information about household (land holding, income level, source of income, size of family, gender, age, caste etc.), climatic events and vulnerability, agriculture activity and adaptation capacity, behavior and decisions in wheat production. Similarly, climatic events and vulnerability set of questionnaire provides information, experience and perspective about climatic events, its types, natures, patterns and vulnerability level. Agricultural activity related data include data related to agriculture activity, farm revenue, types of crops, crop cycle, inputs, infrastructure and markets. Lastly, adaptation capacity, behavior and decisions set provide data set related to income, information, technology, experience, indigenous skills, application and loss reduction. Further, household preparedness is analyzed and identified by using descriptive statistics.

4. Results And Discussion

Result 1: Preparedness Options

Table 1: Preparedness Option

S.N.	Preparedness Options	Percent
1	Reinforce and repair house	12.5
2	Prepare means of evacuation	4.2
3	Move family members to a safe place	50
4	Move livestock and household items to safer place	0
5	Buy and store food, drinking water and other necessities	20
6	Contribute to a local fund in cash and in kind for anti-disaster activities within communities	3.3
7	Regularly update warning information	10
	Total	100

Source: Field Survey, 2015

In Table 1, Preparedness options relates to household socio economic capacity, information and technology. If household has better capacity, there will be more options. If household is vulnerable, options will be limited, inferior and indigenous. Despite theoretical and practical seven options: a) evaluation of the risk, b) adopt standards and regulations, c) organize communication and response mechanisms, d) ensure all resources-ready and easily mobilized, e) develop public education programs, f) coordinate information with news media and g) Disaster simulation exercise, the three catchment areas in different altitudes, locations and landscapes : Gadhi, Lekhagaon and Kunathari have limited preparedness options including reinforce and repair house, prepare means of evacuation, move family members to a safe place, move livestock and household items to safer place, buy and store food, drinking water and other necessities, contribute to a local fund in cash and in kin for anti-disaster activities with communities and regularly update warning information. All are important options for preparedness.

Result 2: House Choice, Preference And Behavior On Preparedness

Table 2 provides the result of house choice, preference and behavior on preparedness options: reinforce and repair house, move family members to a safer place, prepare to evacuate house, regularly update warning information and buy and store food, drinking water and other necessities. It assesses drivers behind household choice, preference and behavior. In table, there are four drivers: indigenous knowledge/experience, government circular, neighbor's initiation and every is doing it. It measures how such preparedness practice patterns and what is its interventional and inspirational factors.

Table 2: House choice, Preference and Behavior of HH

House Choice, Preference and Behavior on Preparedness	Indigenous Knowledge/experience	Government Circular	Neighbor's initiation	Everyone is doing it
Reinforce and repair house	35		35	30
Move family members to a safer place	15		20	65
Prepare to evacuate house	20	30	17	33
Regularly update warning information system	25		25	50
Buy and store food, drinking water and necessities	15		25	60

Source: Field Survey, 2015

Result 3: Measurement of Effective Preparedness Options

Table 3: Effectiveness of Preparedness Options

Effectiveness	Not effective (%)	Fairly effective (%)	Effective (%)	Very Effective (%)
Reinforce and repair house	1		66	33
Move family members to a safer place		9	51	40
Prepare to evacuate house	7	20	33	40
Regularly update warning information			40	60
Buy and store food, drinking water and other necessities			30	70

Source: Field Survey, 2015

Table 3 provides the result of effectiveness of preparedness options: reinforce and repair house, move family members to a safer place, prepare to evacuate house, regularly update warning information and buy and store food, drinking water and other necessities. It assesses level of effectiveness of above all five preparedness options into four levels: not effective, fairly effective, effective and very effective. Such measures explain what is the level of effective to preparedness option by using households.

5. Discussion and Conclusion

Above results of descriptive statistics provide sufficient and necessary facts and figures related to preparedness options of household, drivers of household choice, preference and behavior and effectiveness level of such preparedness options and response whether such preparedness is indigenous or not. Out of 642 sample households, about 50 percent households selects first of all to prepare themselves option-3: move family members to a safe place. About 20 percent households preferred to prepare themselves by selecting option 5: to buy and store food, drinking water and other necessities. About 12.5 percent household reinforce and repair house and about 10 percent household updates regularly warning information. Then it is followed by evacuation of house (4.2 %) and Contribute to a local fund in cash and in kind for anti-disaster activities within communities (3.3 %). Out of seven prepared options, most household choice, preference and behavior is firstly to move family members to a safe place, secondly to buy and store food, drinking water and other necessities, thirdly to reinforce and repair house and fourthly to update regularly warning information rather than fifthly evacuation of house and sixthly contribute to a local fund in cash and in kind for anti-disaster activities within communities. Almost households' choices, preferences and behavior are indigenous.

Above results of either indigenous knowledge, skill and practice or the government's intervention explain how household makes their choices, preference and behavior to select preparedness options including reinforce and repair house, move family members to a safer place, prepare to evacuate house, regularly update warning information system and buy and store food, drinking water and necessities under two determinants: indigenous knowledge, skill and practice (indigenous knowledge/experience, neighbor's initiation and everybody is doing it) and Government Circulation (Regulation). Except 30 percent Government Circulation (Regulation), about 70 percent households have indigenous knowledge, skill and practice out of which indigenous practice of the community (everybody is doing it) (49%) is a key driver and then indigenous knowledge/experience (27%) and neighbor initiation (24%). Despite different distributions, indigenous knowledge, skill and practices are vital to select preparedness options. Almost all options are towards to save life from disaster risk.

Above results of effectiveness measures of preparedness options present which preparedness, one is mostly effective to save their life and assets. In above results, 99 percent households (33 % very effective options and 66 % effective options) measure reinforce and repair house, but about 1 percent household was negative about its effectiveness. Similarly, about 100 percent household amend move to safer place option effective, update regularly warning information and Buy and store food, drinking water and necessities option. At last, 93 percent household opines effective to evacuation of house.

Reference

CBS (Central Bureau of Statistics) (1991). *Population Census*. Kathmandu: CBS

DDC (District Development Committee) (2015). *District Profile*. Surkhet: DDC

Maharjan, S and Shrestha, S., (2017) Disaster Risk Management: From Preparedness to Response in Thecho of Kathmandu Valley, Nepal, *The Third Pole: Journal of Geography*, 17: 98-108

NPC (National Planning Commission) (2015). Post Disaster Assessment Report: Earthquake 2015. Kathmandu: NPC

Tuladhar, G, Yatabe, R., Dahal, R.K. and Bhandary, N.P., (2015) Assessment of disaster risk reduction knowledge of school teachers in Nepal. *International Journal of Health System and Disaster Management*, Vol 3(1): Jan-Mar

VDC (Village Development Committee) (2015). Village Development Profile, Gadhi: VDC

VDC (Village Development Committee) (2015). Village Development Profile, Lekhagaon: VDC

VDC (Village Development Committee) (2015). Village Development Profile, Kunathari: VDC

www.scmp.com/news, www.telegraph.co.uk, www.unisdr.org