Community Based Disaster Risk Analysis (CBDRA): Case Studies from Uttarakhand, India

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Abstract

CBDRA is a tool to analyze the community involvement in disaster management programmes and strategies because the ultimate aim of any disaster management is for safer the community and, also, the local communities are always the first responder. It helps to prepare people, respond to disasters and recover from emergencies. This paper deals with the concept of community based disaster management (CBDM) CBDRM, explains different disasters and their impacts of disasters in Uttarakhand through disaster risk analysis, and case studies. For the data collection authors have used Participatory Rural Appraisal (PRA) tools, interviews, secondary data etc. and for data analysis different techniques and software?s like GPS, Ilwis 3.7, Statistics, and Arc 9 etc have been applied.

Index terms— Community participation, Disasters, Disaster risk analysis, PRA tools, GIS, Management and Planning, case studies

isaster, when anyone heard about that utterance, the first trounce of consideration is damage, pain fatality and other negative reflections on the mind thought process, all these comes in mind because directly or indirectly they are related to community. Community is always in the nucleus of any learning. For example when any disaster strikes in the uninhabitated zone the amount of natural or human allied losses are less counted and on the other hand, with the same intensity, when it strikes at the populated zone the amount of loss it counts a lot. Impact on community makes disasters more prominent. Risk of damage is high in populated zone in comparison to uninhabitated zone. In simple words -Disaster risk is the probability of a hazard occurring and creating a loss.? Disaster Risk is the actual exposure or threat of hazard on humans and is often referred as the product of probability of loss.

2. To find the exposure, resistance, resilience, vulnerability, hazard and management status with the help of PRA (Participatory Rural Appraisal) tools. 3. To investigate the major causes of disasters in the area and, 4. Finally suggesting a management plan for the region.

To make the work effective and factual, authors have used both the primary and secondary data:

1. Collection of primary data by using PRA tools and conducting interviews for ground reality, 2. Study the region and assess different disasters.

1 Collection of secondary data for analyzing,

explaining, and combining the information from the primary source with additional information. 4. Using Ilwis 3.7, Arc 9, Statistica 8 for mapping and clustering and other purposes, Community Based Disaster Management Planning (CBDMP) is an assertion which involves the local community perception and participation in disaster management planning. CBDMP involves communities in identifying, assessing and acting jointly to reduce disaster risks. In the same time when we engage the local communities in diverse disaster risk scenarios, e.g. exposure, resistance, resilience, vulnerability, hazards, management etc, it is known as Community Based Disaster Risk Analysis (CBDRA).

Uttarakhand, located in the northern part of India, extending from 28º 43' N to 31º 27' N latitude and 77º 34' east to 81º 02' E longitude, is the 27th state of the Republic of India and was carved out of Uttar Pradesh on 9th

Nov 2000. The state is bordering, Nepal in the East, Himachal Pradesh in the west, China in the North, Uttar Pradesh in the South. Vulnerability is a product of three dimensions: (i) Exposure, which is a largely a product of physical location and the character of the surrounding built and natural environment. (ii) Resistance, which reflects socio-economic, psychological and physical health and their systems of maintenance, and represents the capacity of an individual or group to withstand the impact of a hazard.(iii) Resilience, to natural hazard is the ability of an actor to cope with or adapt to hazard stress. The above table show that the exposure (69.23) and resilience (34.09) level of the Mandal village is low amongst all, with the score of 73.68 and resistance level of Lumti village is low. In total vulnerability of Mandal village with 60.75 score is the lowest and Barsundhi village with 87 score is the highest.

2 M = Management

Disaster Risk Analysis: Disaster Risk Analysis of the selected villages is done using the following formula: The household management analysis principally needs three categories of data i.e. Pre-disaster data, during disaster data, post disaster data. For the present study selected villages household data has been collected through PRA during field visit (Table **??**).

3 Table 5: Household management analysis

The above table shows that the prevention level of all the villages fluctuates from 78.94% of Mandal village to 24.20% of Barsundhi village. It is because Mandal is connected with a town. Preparedness level of all the villages is below 22 % and the mitigation conditions are also very poor below 40%.Therefore it can be assessed that pre disaster scenario of all the selected villages is very gloomy. In during disaster section response level varies from 0 to 24% means, community participation level varies from 5 to 80%, and rescue and relief scores between 21.42% to 59.99%. In post disaster section damage assessment is 29.99% in Lumti village because of inaccessibity while in Barsundhi and Dhari damge assessment registers 100% score. Community health related score is below 35% and rehabilitation and restructuring is also below 50%, so it can be said that disaster management planning is in a very poor condition in all the phases of disasters.

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Communities are the first to be affected by any hazard and first who respond to the disasters so it is imperative to give the community participation a proper place in disaster management and disaster risk related plans and programmes. Over the past few years -CBDRM? is gradually becoming common in the area of rural development. It is a discipline that involves preparing for disaster before it occurs or in pre disaster phase, e.g., prevention, mitigation and preparedness etc, helping in during disaster phase, e.g., response, emergency evacuation, quarantine, mass decontamination, rescue and relief etc., as well as post disaster phase e.g. damage assessment, community health, supporting, restructuring and rehabilitation of society. [1] [2]

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Figure 1: Fig 1 :

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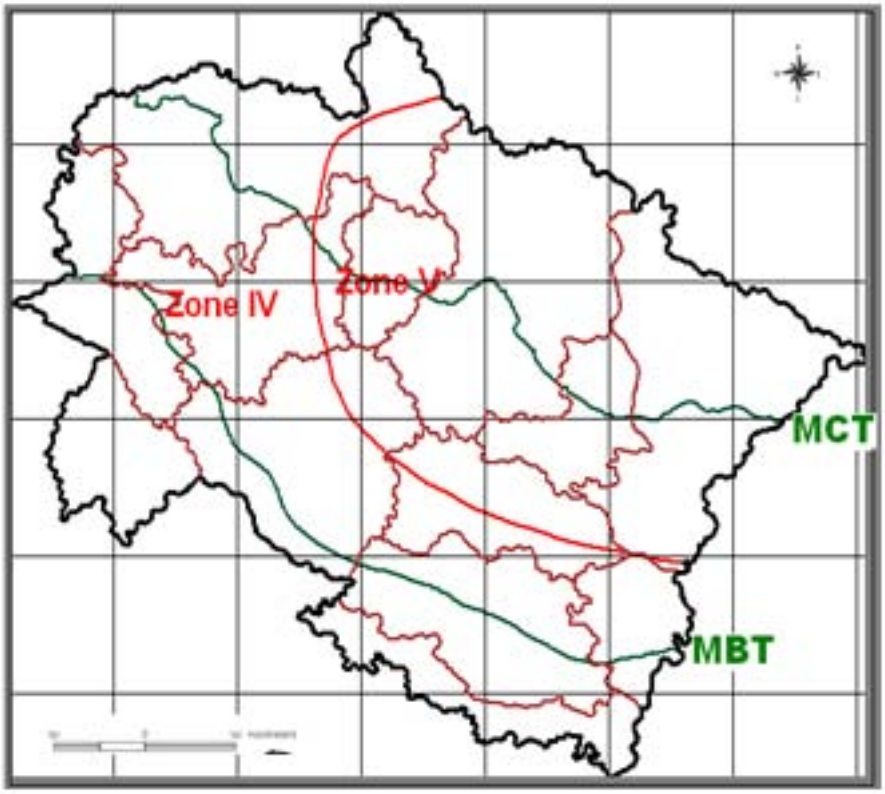

2

Figure 2: Fig 2 :

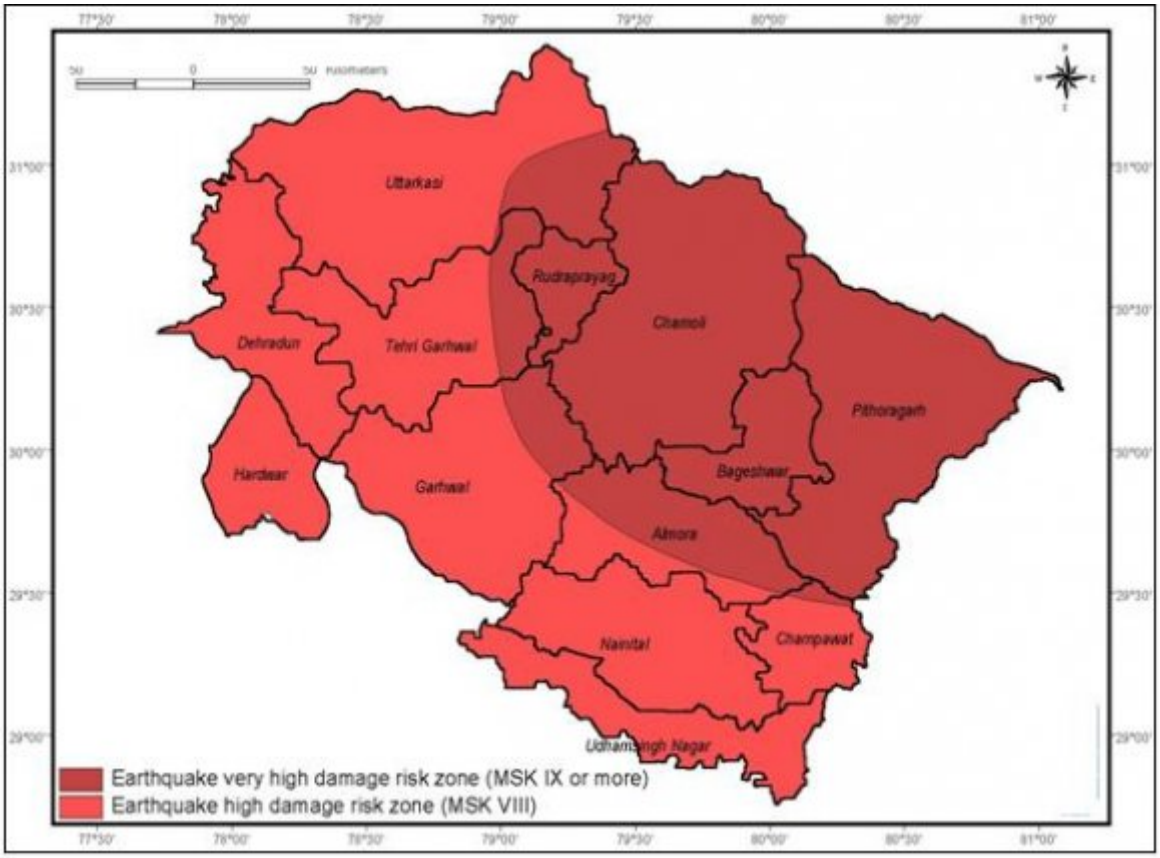

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Figure 3: Fig 3 :

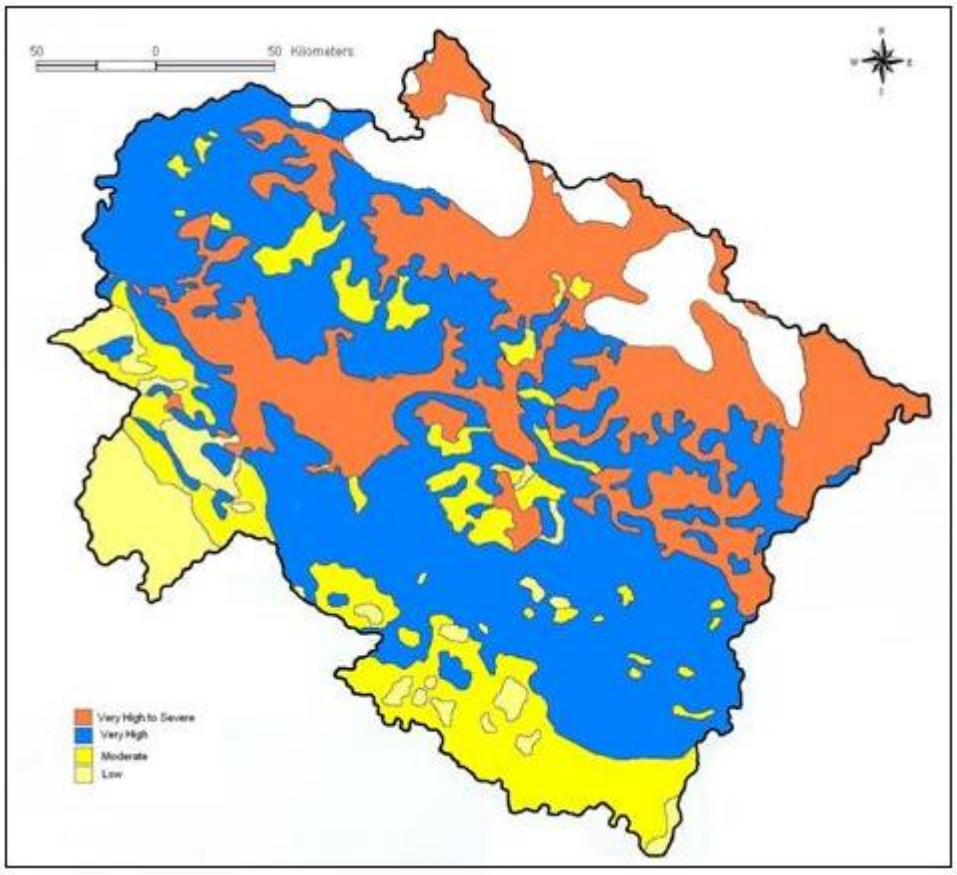

Figure 4: R

1

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Figure 5: Table 1

1

S.No	Village Name	Block Name	District Name	Lat/Long of the Village
1	LUMTI	Dharchula	Pithoragarh	80°19'27.023"E 29°53'01.792"N
2	POTHING	Kapkot	Bageshwar	79°51'54.803"E 29°58'36.135"N
3	DHARI	Naugaun	Uttarkashi	78°08'51.777"E 30°44'28.158"N
4	BARSUNDHA	Agastyamuni	Rudraprayag	79°07'08.746"E 30°26'05.232"N
5	MANDAL	Dhasoli	Chamoli	79°16'13.922"E 30°27'51.743"N

Figure 6: Table 1 :

2

Village Name	Total Population	Number Household	Medium Transportation
LUMTI	355	76	Private Jeeps
POTHING	5439	578	Bus, Private Jeeps
DHARI	102	22	Bridle path to village only
BARSUNDHI	120	25	Bridle path to village only
MANDAL	630	135	Private Jeeps

b) Village Data Analysis
Date related to vulnerability (exposure, resistance, and resilience), Hazard (Frequency and severity), Manag

Figure 7: Table 2 :

3

Village Name	Exposure (a)	Resistance (b)	Resilience (c)	Vulnerability (a + b + c) /3	Hazard	Management
LUMTI	76.92	73.68	56.81	69.13	22.16	10
POTHING	84.61	84.21	45.45	71.42	20.16	10
DHARI	84.61	84.73	72.72	80.68	19.83	10
BARSUNDHI	76.92	100	84.09	87	20	10
MANDAL	69.23	78.94	34.09	60.75	24.16	10

Figure 8: Table 3 :

4

c) Household Management Analysis:

Figure 9: Table 4 :

Village Name	R = (H*V)/M
LUMTI	153.19
POTHING	143.98
DHARI	159.98
BARSUNDHI	174
MANDAL	146.77

Village Name	Pre-Disaster Data (In %)			During Disaster Data (In %)				Post Disaster Data (In %)	
	Prevention	Preparedness.	Mitigation	Response	Community Participation	Rescue & Relief.	Damage Assessment	Community Health	Rehabilitation & Restructuring
LUMTI	38.94	12.76	30.30	24	13	41.42	29.99	33.22	22.85
POTHING	29.46	21.27	23.74	24	17	59.99	56.66	33.84	21.90
DHARI	56.83	21.27	29.99	0	68	35.71	100	30.76	47.61
BARSUNDHI	24.20	4.25	37.50	0	5	21.42	100	12.30	19.04
MANDAL	78.94	19.14	15.62	20	80	50	100	32.30	42.85

Figure 10:

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