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COMMUNITY INITIATIVES FOR DISASTER RISK REDUCTION A CASE STUDY; UTTARKASHI, INDIA

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Abstract:- In Uttarakashi, 1991 earthquake, Cloud burst of August 2001, splendid Varnawrat Hill became fragile and crumpled down in 2003. Again in August, 2012, the big blow (cloud burst) has triggered vast devastation and loss of biodiversity. An attempt has been made to minimize the threat by participatory approach. Therefore capacity building on database creation, networking, coordination, and constitutions of disaster management committees (village to district levels), rescue, evacuation and earthquake resistant technology were adopted. A workshop with children of 16 villages (seismic zone IV and V) was conducted to sensitize them on data collection and situations of vulnerability. They were also given exposure on the process of decentralization by interacting with revenue department. Other participants, viz. Gram Rakshak (village guard), adolescents' girls, retired military personnel, youth and masons' were trained on preparation of action plan, rescue and relief and masonry respectively. Mock drills for about 1200 students were also conducted. Further staff trainings, participatory community camp were also organized. Till 2012, about 170 villages were covered under Disaster Risk Reduction (DRR) project in Shri Bhuvneshwari Mahila Ashram (NGO). The localites are not only aware but they are cautious too and repeatedly cooperating on disaster mitigation efforts. Which depicts that people's participatory approach in disaster management planning is leading towards sustainable hazard mitigation.

Keywords:participatory approach, community planning, sustainable hazard mitigation.

1.INTRODUCTION

Himalayas are considered to be the vulnerable and geologically sensitive features. It supports a variety of natural resources to the Indian sub-continent, including the bountiful glaciers which are considered to be origin of several river basins in Indian sub-continent. Being fragile and vulnerable, Himalaya is also included in major seismic region in Asia. On the other hand natural atmospheric cycles especially rainfall also makes this region more prone to natural disaster like cloudburst and flood. The heavy rain falls in this also responsible for few other natural hazards - flash flood, debris-flow, mass movement, landslide, and rock-fall. It is now well known that Himalaya is ecologically fragile and highly sensitive zone for human settlements.

Geographically, a large number of faults cut the Himalayan arc into differentially moving segments, and divided by deep and active thrusts[1]. Data indicates that out of the total 13 districts of Uttarakhand, 5 districts are included in zone IV & V, 4 districts are included in zone V and 4 districts are included in zone IV category of Seismic Risk Zonation[2]. Many locations in Uttarakhand are high vulnerable to natural disasters in varied degrees (out of 95 Development Blocks 38 fall in Zone V. Superimposed on the natural processes, accelerated pace of anthropogenic activity further enhanced its susceptibility. The report of Economic and Social Commission for Asia and Pacific[3] warned that Himalayan ecosystem is approaching a stage of disequilibria and there are evidences to suggest that both natural resources and environment is experiencing negative changes. The natural un-stability in Himalayan terrain has been questioning the human sustainability and resource accessibility. Natural disasters have been affecting the livelihood opportunities in Himalayan rural areas. This is mainly due to enhanced fragility of the slopes, high soil erosion and landslides which leads to depletion of biomass and natural water sources, dwindling agricultural productivity, frequent flash floods, erosion of hill economy and lastly migration and leading towards poverty.

The minimization and mitigation of disaster related social, ecological and economical issues are of prime objectives of local policy makers and development planners. The involvement of local community in disaster mitigation plan can not only reduce the vulnerability at local level but at the same time also help to implement the plan of governance at high success rate.

However, the efforts are needed to improve the living conditions of innocent but ignorant people along with sustainable natural resource management strategies. This study was conducted in Uttarakashi district of Uttarakhand to see the impact of community training and mitigation planning at local scale by involving local stakeholders.

2.METHODOLOGY

2.1 Study Area

The district Uttarkashi is situated in between 300.22' to 310.25' latitude and 710.51' to 790.27' longitude having an area of about 8016 Sq. Km. Three major geographical distinctions i.e. Snow bound area, Middle hilly region, Ganga and Yamuna valley with the forest area is about 88%. Main forest types are Pines species (Pinus roxberghee, Pinus wallichiana), Cedrus deodar, Rhododendron species, Quercus semicarpifolia, Abies pindrow, Abis spectabulis and Betula utilis etc. Grasslands on alpine pastures on high hilly areas called as “Bugyal”. The area is rich with wildlife like Leopard, Bear, Tiger, Monal, Kaliz etc. also having many wetlands (lakes) like Dodital, Nachiketatal, Saat tal, Sahstra tal, Khara tal, Saptarishital. District is blessed by two religious places Gangotri and Yamnotri. From Gomukh (origin of Ganga) near Gangotri Bhagirathi gets its origin and Yamuna originates from Yamnotri. Uttarkashi Township is a district headquarters. As per census 20014, district depicts a male population 57% and females 43%. Uttarkashi has an average literacy rate of 78%. In Uttarkashi, 11% of the population is under 6 years of age. It is predominantly inhabited by the Bhotiya (Jadh tribe). District has five Tehsil (sub divisions) and five Blocks (sub division of Tehsil) with 36 Nyay Panchayats (sub division of Block) and 373 Village Panchayats (village level administrative unit). There are two Nagar Panchayats in the district i.e. Uttakashi and Barkot.

2.2 Background

The topographic variability has strongly influenced the concentration of habitation in the region. Majority of the villages are located in the southern facets of Himalayan ranges due to less ruggedness of the terrain and more sun illuminations whereas, the higher ranges of Himalaya is scanty populated. It is also proved through previous studies on satellite data that the most of the habitation is located either on southern side, south-east or south-west part of Himalayan ranges dominated by major developmental activities like; roads and other infrastructural developments[5]. As a result these slopes are heavily degraded as far as biodiversity is concern. However, if we look at the present day pattern of slope instability, they are concentrated at this zone dominated by crushed and sheared rocks that demarcates the boundary between the Lesser Himalaya and the Higher Himalaya (hence forth the transitional zone). Considering that majority of the slope failures at times lead to temporary damming of rivers occurred in this zone with maximum number of active and old landslides, suffers from frequent slope instability and flash floods with increasing number of causalities and biodiversity loss. While seeing the above facts the present study was undertaken with people's participatory approach, the only method which is only available resource even at the time of disaster or during the event (golden hours).

2.3 Data Collection and Study Protocol

How best the impact of disaster on the terrain and on people can be reduced the efforts were made while ascertain following objectives:

a.To organize series of workshop and orientation programmes for sensitization.
b.To constitute Disaster Management Teams and Committees from Village to District level.
c.Capacity building on Rescue and Evacuation and Earthquake Resistant Structures. Networking, Coordination and Awareness Generation.
e.Database Creation on Community (village) Level.
f.To organize the above procedures following methodology was adopted.

2.3.1 Orientation and awareness camps

Three (3) days orientation workshop of future generation (schools children) from Bal Panchayat of 16 villages (2 from each village i.e. 32) of Bhatwari and Dunda block had been conducted in transitional zone i.e. Bhagirathi basin. Sensitization was done about hazards in view of the fact that terrain is seismically active; the youth brigade was also trained on the causes of earthquakes, its impact on land and settlement. Techniques of primary data collection i.e. soils, rocks, and vegetation was also shared among participants. The database was created with the help of "Village Vulnerability Assessment" forms in anticipation to build capacity among future generation for sustainable hazard mitigation for better livelihood in Himalaya.

2.3.2 Village Vulnerability Assessment

Village Vulnerability Assessment form was prepared in two part. The first part includes the basic information on natural resources like; forest and status, water availability, topography and rock types. The second part includes the history of disasters, reason, efforts made by Govt./NGO), probable disaster locations, source of information and cross verification of data by Panchayat Functionaries (PFs) and Village Development Officer (VDO) for authenticating database collected by Non Govt. Participants.

2.3.3 Trainings

a)Earthquake Resistant Constructions (mason trainings were given by field experts)
b)Rescue and Relief (training to adolescents and youths by subject experts)

Operational organogram was also formed for Panchayat functionaries; NGO's and Village panchayats for organizational building, awareness generation, sensitization, identification of volunteers. For village level coordination committees; Data gathering, action planning & preparation of disaster mitigation plans. For Block level coordination committee; resource mobilization, settlement, situation analysis, coordination collective planning and for District level coordination committee; networking, regular meetings with all stakeholders and advocacy.

3. RESULTS AND DISCUSSIONS

The approach was based on Participatory Learning Action (PLA) for better realization and understanding. Chambers[6] also argues that that poor and exploited people can and should be enabled to analyze their own reality. The interaction of children and youth with government machinery strengthens the process of decentralization whereas the awareness among young mass will encourage them for sustainable developmental approaches. Keeping in view the above facts the participants were given training on traditional and modern earthquake resistance house building techniques and in rescue relief also. In addition to this, community was also made aware about the concept of disaster and development and natural resource management with watershed approach.

The Bhatwari and Dunda block, Uttarakashi district had been covered through awareness campaigns also on different issue like earth quick, forest fire, cloud burst, road accident by the expert agency. According to Bhatt[7], an example of the Annapurna Conservation Area (ACA), Nepal which is being managed by the local people themselves with minimal intervention from the Government and/or other institutions".

The special emphasis was given to discourage bottled water encourage filtered water, no glass and mineral water zone, micro-hydropower projects owned by villagers only, solar power projects and organic farming. It is noticeable that Uttarkashi area is blessed with two religious places and usually has great pressure of pilgrims.

When we talk about watershed and land use practices, it is important to mention that agriculture areas in the Central Himalaya constitute a very tiny fraction of the total area. Just to give an example, in Chamoli district a part of which lies in the transitional zone had only 8% area under agriculture during 1990[8] . Therefore, agriculture (local land use practices) can be accounted for the terrain degradation. Forest by locals is treated as treasured commodity which was judiciously used for their survival. The local dependency on forest is limited to fuel, fodder, and timber. This is nicely expressed by Berremann[9] and reproduced by Haigh[10] which says that "the Paharis (hill people) live in their non-to-hospitable environment largely by full utilization of forest products as is readily evident to any observer. Such utilization of the forest does not seriously affect the forests. Where devastating depletion has occurred and is still occurring in the name of development by unorganized planning and implementation. According to forest working plan of District Chamoli, between1959 and 1969 the maximum commercial forest felling was identified as major contributor to slope instability[11]. Similar was the case in Uttarkashi, Tehri and Pithoragarh districts.

However, in recent studies, some connectivity between deforestation and slope instability/flash floods were observed[12,13]. This may be conjectural but the fact remains that the trend of natural disaster leading to terrain instability shows an increase both in frequencies and magnitude after 1969. The slope instability was attributed to the fragility of the terrain due to its proximity to Main Central Thrust (MCT) coupled with torrential rain[14]. Especially in monsoon Himalaya (full of thrust and faults), where maximum incidences of slope instability occurred[15].

A recent example is the breaking down of Varunawrat Parvat above Uttarkashi town during September 2003. For days together people of the town were reeling under the threat which persists even today. Studies in Himalaya have shown that forest can regulates the catchment hydrology by maintaining a balance between the peak flow and base flow[10].

Shri Bhuvneshwari Mahila Ashram (SBMA, NGO), Anjanisain, Tehri Grahwal, with its branches at Uttarakashi (District Uttarakashi), Gairsain (District Chamoli) and Dehardun. The organization is working vigilantly on disaster mitigation and management with community participation from 2005 onwards.

In view of this, it is pertinent that an in-depth study with participatory approach is needed to bring out a blue print of the existing status in which the traditional wisdom and modern science should supplement each other.

3.1 Earthquake Resistant Construction Training (ERCT)

The only alternate to survive in Himalayan terrain is to mitigate the impact of disaster. In view of above the initiative was taken towards preparation of ERCT (Balbadi Bhwan) with the involvement of local masons. Considering that during an eventuality like earthquake, people require a community place. If the community halls are created specifically for housing the affected population during the calamity, The Plan of "balwadi" (children's shelter) such community houses degrade with time. It was decided to construct earthquake resistance Balbadi, which under normal circumstances can be, used as school where as during the calamity can serve a protected shelters. To start with a team of local available masons was trained in this technique.

(Fig. 1).

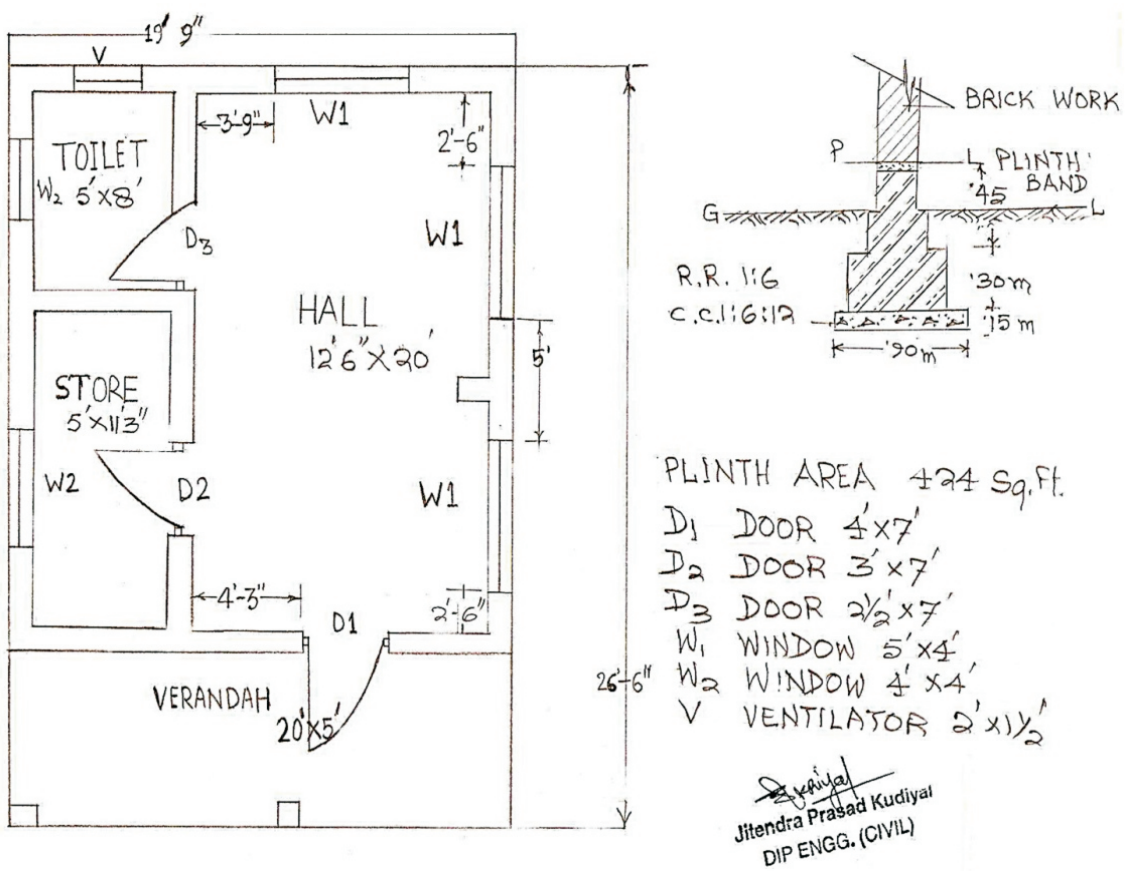

Fig.1 The Plan of "Balwadi" (Children's Shelter)

The Earthquake resistant structures had been made in consultation with the experts. Presently the structures are being used for Balwadi progamme for the children. The local masons were invited from the identified villages got an opportunity to get in touch with modern knowhow as well as the employment generation opportunity for the future with a hope to create more awareness among villagers towards disaster management approach for better livelihood practices. According to Disaster Mitigation and Management Centre (DMMC), Uttarakhand[16], which depicts the detailed survey carried out around Uttarkashi to assess the awareness levels of masses. Around 1604 respondent from Chamoli and Uttarakashi of different age group participated. The survey depicted that out of total respondent 97% from Chamoli and 95% from Uttarkashi agreed upon that after sever earthquakes the awareness level of localities has been increased. Interestingly the survey depicted that the locals prefer the traditional masons with blending of modern know how that is why around 25% in Chamoli and 24% in Uttarakashi were shown interest towards ERCT. The respondents from Chamoli (35.5 %) and Uttarakashi (39%) also shown interest towards awareness campaigns.

According to Rautela and Joshi[17], Uttarakhand shows an elaborate tradition of constructing multistoried houses. Rajgarhi area, Uttarkashi District has a large number of intact multistoried traditional houses with marked antiquity and distinct construction style. The region had evolved a distinct and elaborate earthquake-safe construction style as early as 1000 yrs BP, known as the Koti Banal architecture. It exhibits elaborate procedures for site selection, preparing the platform for raising the structure, somewhat similar to that of framed structures of the present times. This indicates that the traditional

technology in the past took care about earthquake. It would have been better if we would have blended the old traditional technology with modern technical knowhow.

3.2 Rescue and Relief Training

Since SBMA believe from its formative stage that unless the natural and human resource conditions are improved, any developmental planning for the region would rarely yield the desired result. Since the main workforce in the region is a woman, hence improving the natural resource base would imply the improvement of the living condition of mountain women. One of the methods adopted was to involve adolescents' girls, retired military personnel and youth of the village for rescue and relief training at Himalayan Adventure Institute (HAI) at Musooriee (Fig. 2).

Fig.2 Rescue and Relief Training

Village was considered as functional unit giving especial significance to women and children. Knowing well that any planning in the region are seriously modulated by frequent incidences of natural/manmade calamity, hence SBMA intervention during earthquake, landslides, forest fire, flood additionally helped in understanding the interrelationship between the nature, man and developmental activities. As far as rescue and relief training is concern, about 32 Gram Rakshak (Village gaurds) were trained at HAI Mussoorie in the initial stage (2006-07) whereas upto 2012 about 170 villages were covered under DRR project18. Likewise the other branch i.e. Gairsain has also taken the initiatives in the same way. 120 participants had been trained in search and rescue up to mid of 2007. The photographs below are the silence witness of the training. According to Pearce19 the Australian and American research have also highlighted that the focus should be shifted from response and recovery to sustainable hazard mitigation. In order to achieve this goal it is necessary to integrate disaster management and community planning. He emphasized to integrate disaster management with community planning for sustainable hazard mitigation. It must be participatory in nature and must be linked with the local decision-making level. Thomas's20 Effective Decision Model of public involvement shows that, in most situations, shared public decision making is crucial to any effective approach to mitigation. Activities and community participation is increasing day by day can be seen by dataset depicted (Table 1).

Table 1. Activities and Community Participation

Activity	No. of Participant 2007-08	No. of Participant 2011-12	Activity out com	Remark
Staff training; DMM[a].	20		Capacity building; DRM[b], relief work & MD[c].	Cutting edge; benefited
Formation of EC[d]		29 GP[e] (184 People)		Community conscious
ERC[f] Demo at Kankradi & Pahi village	02 villages		Community appreciation	Being used as Balwadi.
MT[g] on ERC[f].	16		Mason knowing ERC[f] techniques.	Knowledge to community on ERC[f].
Community camp; DMM[a]	11 village		Basic knowledge on DMM[a] & S & R[h]	Community conscious
S & R[h] training course at HAI[i]	120		Children, adolescents & GR[j] trained on S & R[h]	Reserve potential of trained hands
IEC[k] training to children	30		Street play; DMM[a] by children	Campaign by children.
Lohari Nag Pala Dam		Study; affected area	Sharing with Minister & Secretary, State.	Up to Policy planning level
Campaigning; community level.	90 Panchayat		demonstration; Panchayat level using IEC[k]	Sanitized community.
follow –up by GR[J] at village Barsu.	80		Experience sharing; Panchayat level.	Being practiced by stakeholders
volunteers trained on S & R[h]		24 Volunteers	Experience sharing; Panchayat level	Reserve potential of trained hands
Immediate FRA[l] to Affected families.		217 Families of 8 villages	immediate relief to avoid chaos	confidence buildup
Assistance; families of Bhatwari block		27 families	immediate relief	satisfaction & belief
R & A[m]		27 people & school	temporary shelter & van provided for two months	confidence buildup
MD[c] exercise at 12 school	1200	24 schools (540)	MD[c] exercise at schools.	Regular follow-up at school.
Micro Plans		48 communities	Capacity building	conscious and belief
DLM[n] ; Panchayat leaders & CBO's	96		Impact of hydro Project; social, water and agricultural land issues.	community development Project funded by NTPC[o]
State meeting; reputed scientist and thinkers	76		Disaster& management should be Participatory	database sharing & planning; participatory

a: Disaster Mitigation and Management, b: Disaster Risk Mitigation, c: Mock Drill, d: Emergency Committee, e: Gram Panchayat, f : Earthquake Resistant Construction, g: Mason training, h: Search & Rescue, i: Himalayan Adventure Institute, j: Gram Rakshak, k: Information, Education & Communication, l: Food Relief Assistance, m: Relief and Assistance, n: District Level Meetings, o: National thermal Power Corporation Curtsey; Plan India Project, SBMA/Plan, Uttarkashi, 2007-08, 11 and 2012.

SBMA-Plan Uttarkashi is working in 170 villages of 101 Panchayat of Uttarkashi district. The project "Community Initiative for DRR in Uttarkashi" is implementing in all the village Panchayats of Bhatwari and Dunda blocks. Total 170 Children Groups i.e. BAL Panchayat, 166 Adolescent girls group (Kishori Samooh), 164 Mahila Mangal Dals (women's groups) members, 30 community level Disaster management committees, 72 schools and 101 Panchayat representatives are the primary beneficiaries and stakeholders of the project (Plan India Project: 2012).

3.3 Community managed disaster mitigation awareness camp

In disaster prone area, community should be known through the awareness on different issue like earth quick, forest fire, cloud burst, Road accident to minimized the search and risqué operation, Information Education and Communication campaign is also being run by SBMA (expert agency) in the Area.

It would be unjust to see disaster as a single entity. For sustainable hazard mitigation it is essentially required to make community aware about the sustainable use of natural resources in their respective watershed. Besides above observations it has been noticed in the filed by increasing frequencies of developmental projects and excessive natural resource used in tributary watersheds has aggraded the stream channels. Sediment supply from catchments exceeded the flushing capabilities. The unprecedented rainfall has also aggravated the slope failure incidents converted into disasters for example on 13-15 September, 2012. An initiative was also made to combat the threat of desertification in Mountain, considering the magnitude of the problem. It is noticeable that every year one hamlet is being vanished from the map of Uttarakhand because of the increasing frequencies of calamities.

4.CONCLUSION

To summarize, The Himalaya is turbulent since its inception; however, if the turbulence began to threaten the livelihood, it implies that something seriously wrong is happening. Disaster degraded the quality of life and environment in Himalayas. This is a matter of serious concern. Therefore, the task ahead is to identify such components that aggravate the stability of the terrain and careful scientific research with intense participation of communities can prevent the happenings. This has to be done at the local level where people must be motivated so that they take the initiatives. Any efforts towards maintaining the sanctity of green earth will save community from hazards and from increasing frequencies of disaster. In the recent past it was also mentioned by Joshi21 that scientific measures suggested by two studies after the 1998 disaster were not implemented. Wherein it was also mentioned that the satellite detected that road connecting Mansoona village (owing to the proximity to the Main Central Thrust (MCT) also played a catalyst in enhancing the devastation.

Thus while constructing building, nature of slope, location of area, and building materials should be taken into account to minimize the loss from earthquake. The earthquake resist houses should be constructed in the areas prone to earthquake. The idea of a disaster resilient Uttarakhand can be achieved only by popularizing the culture of preparedness among all faction of society. The paper concludes participatory approach which demonstrates that people participatory approach in disaster management community planning leading towards sustainable hazard mitigation.

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