

SSS Research Project Draft Report

A study on possibilities of alternative livelihood activities and utilization of available village amenities post disaster : A case of Uttarkashi District of Uttarakhand



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**SSS PROJECTS, DIRECTORATE OF ECONOMICS &
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I. INTRODUCTION

1.1 THE RATIONALE BEHIND THE STUDY

The major impact of the June 2013 floods in Uttarkashi district have been the loss of livelihoods for majority of the population who were dependent on Agriculture and Tourism. Local people used to work as drivers, cleaners, porters, waiters and provide other services. Therefore, due to indefinite halt of the tourism in this area owing to damaged roads, people dependent on tourism have lost their source of income[DDM, Uttarkashi 2014]. Livelihoods are a key to understanding people and their risk-taking behaviour. People's income, nutrition, health, education and general well-being all derive mainly from being able to carry out livelihood activities. [World Disaster Report 2014]. Thus study on livelihood restoration by tracking possible avenues of alternative livelihood is an important area of concern for the district of Uttarkashi, the most disaster prone district of the state. On the other hand, availability of village amenities post disaster like school, health centre, post office, banks, sources of energy, cooking fuel, drinking water, availability of SHGs etc. has an interlinkage with further development of the village and its inhabitant's livelihood post disaster. Hence there is a huge need to understand these two domains 'alternative livelihood' and 'utilization of available village amenities' together for policy purposes post disaster.

The Himalayan mountain system is one of the most fragile and complex ecosystems in the world. People living in this region rich in terms of natural resources happen to be the poorest of the poor and marginalized. They are primarily dependent on subsistence agriculture and forest resources and are struggling for raising their income and quality of life. Frustrated youth are migrating in large numbers to the urban and industrial regions in the plains in search of employment (Maikhuri et al. 2011; Negi et al. 2011). Many of the villages are turning into ghost villages as households are getting locked in search of livelihood in some other suburban or urban areas of the state.

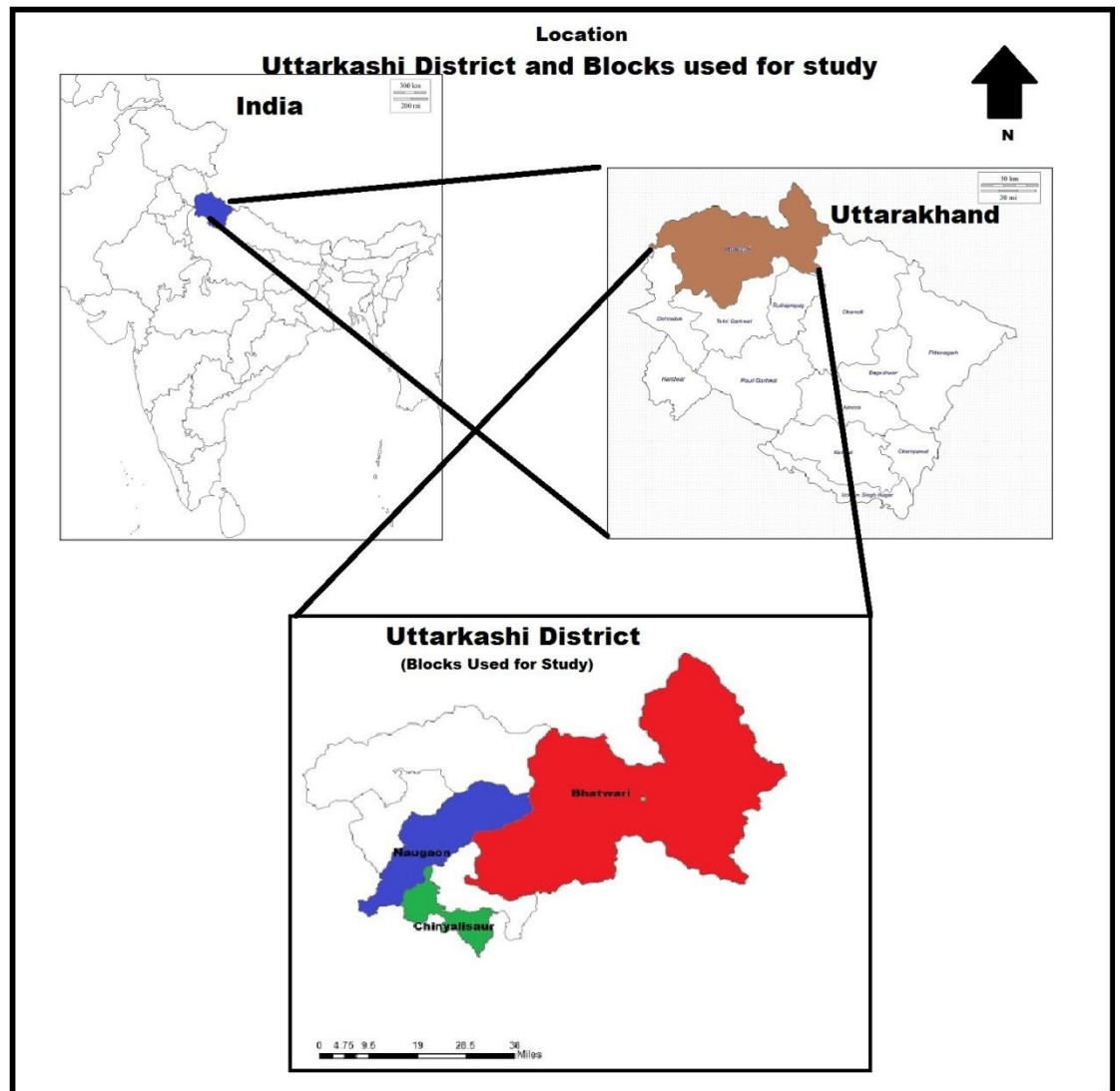
Land degradation, deforestation, deterioration of natural resources and increasing poverty are threats to the livelihoods of not only 115 million mountain people but also the much larger population inhabiting the adjoining

Indo Gangetic plains (Ramakrishnan et.al. 1996; Saxena et al. 2001). The vulnerability takes a more vulnerable shape when it is complemented by any form of natural disaster which are mostly unforeseen. The 2013 disaster in Uttarakhand had made many people landless, homeless with loss of life of human and animals and most pertinently , threat to the livelihood of the village folk. The extent of the disaster was such that the nomenclature of the event has been 'Himalayan Tsunami'. Many reports have come up since then measuring the loss of physical infrastructure and the way ahead including mitigation for future but no comprehensive study has been carried out addressing specifically the livelihood issue after the disaster and the issue of alternative livelihood especially under circumstances of available amenities, resources in the area and other persisting threats in livelihood like animal intervention in livelihood.

This research project is an attempt to bridge the gap through an extensive study in sampled blocks of Uttarkashi district.

1.2 THE STUDY AREA

Figure 1.1 Map showing the sampled blocks of Uttarkashi district.



Uttarkashi is a multi-hazard prone district facing both natural as well as anthropogenic causes resulting from unplanned development of land, forest cover, flood plain, uninterrupted population growth and tourism. As a result of the recurring disasters, the district has become socio-economically very vulnerable. **Kumar and Walia (2013)** have documented that post

disasters, early return to livelihood should be the goal of all these measures.

Uttarkashi is one of the districts that have been facing the impact of multiple natural disasters that has destroyed growth and development. For the past many years the district has been trying to overcome its damages. After the 2013 disaster, besides the loss from landslides and severe rainfall, the main rivers changed their courses thereby creating more additional damages and destruction. **Bhatwari** and **Naugaon** blocks were the two most affected areas. Due to immense loss of infrastructure, maximum villages in Bhatwari and **Chinyalisaur** blocks were cut off and as a result of this non-connectivity and inaccessible, the livelihood of people was relatively more distressed. The disaster washed away hundreds of houses, hotels, agricultural lands, basic amenities including infrastructure, portable drinking water, and education was ruptured. As a result of all this destruction livelihood of the people was and has still been adversely affected because most of the population depend upon agriculture and tourism for its survival and growth (**Adkani 2014**). Hence Bhatwari, Naugaon and Chinyalisaur have been considered for the study.

II. RELATED SIGNIFICANT STUDIES : A REVIEW OF LITERATURE

Himalayan forest are one of the important source of biodiversity that caters variety of direct and indirect human needs, besides ecosystem services that are essential for sustenance of human life. However the extreme precipitation events and their disastrous consequences are a common phenomenon in the Himalayan region. The excessive rainfall of 16th-17th June 2013 triggered massive landslides, glacial debris flow and flash floods that resulted into enormous loss of life and property. The luxuriant forests are inevitable to strengthen the environmental security in Uttarakhand however various reasons have been given. There has been an overall increase of 125300ha forest cover from 1997-2011 and has also been reported contradicting the statement of rapid decrease of forest cover. This study by **Negi (2014)** is suggestive that the disaster was inadequately linked to deforestation to promote developmental activities including hydro-power projects instead these dams played a protective role saving the flash flood in the downstream areas.

The 2013 tsunami in Uttarakhand took a tremendous death toll, affecting 4200 villages, missing people. In addition to this there was severe loss to property, including heritage and religious structures. A report by **India Habitat Centre (2013)** points that excessive and unstoppable development activities by using dynamites for road construction, mining, dam construction, large scale encroachment has led to an increment in the number of these disasters like landslides, floods, droughts, hailstorms. Agriculture is a source of livelihood for most of the people of Uttarakhand and this sector has suffered the most devastating consequences of the disaster. As per the report of the planning commission, even before the occurrence of the disaster the net cropped area in the state was only 13 percent, reasons being lack of irrigation facilities and fragile mountain agriculture.

2.1 DISASTER AND LIVELIHOOD

According to the Uttarakhand floods 2013, **Joint Food Security and Livelihoods Assessment Report** the major challenge after any disaster is restoring livelihood sources. Main source of livelihood in the area is tourism and allied and agriculture and allied activities. After the disaster there was a

loss in both of these avenues. The adverse effect was on livelihood of the region. The major effect of the disaster was on the families whose food security was based on tourism, animal husbandry, agriculture, and horticulture. Many households lost their livestock due to recurring heavy rains and landslides. Many people had to sell their livestock in order to recover from their losses. Due to damage of infrastructure especially roads, the perishable agriculture produce was difficult to preserve and also as a result of this the farmers were forced to sell the produce at rates below the price floor. People lost their traditional habit of storing food grains for the whole year and have switched to daily needs. One of the major concerns was that due to loss of crops and agricultural lands, there was an acute shortage of fodder. The farmers market and agricultural trade flows have been dysfunctional. The supply of food in the public distribution systems have also been affected along with fuel. All this has resulted in increment of food prices making it one of the major issues to be taken into account. This price hike has further affected the consumption expenditure patterns of the communities creating a threat especially to the vulnerable households.

Sharma and Dobriyal (2014) documented that climate change is a major global issue of great concern, it has affected agriculture by bringing changes in farmer behavior, quality, quantity, cost of production, changes in agricultural production, consumption, prices, agricultural trade patterns, and in many other ways. It is considered that the mountain regions are more vulnerable to climate change and directly affects the livelihood because most of the economic and livelihood sectors are agro-based.

Mamgain (2007) examines the pattern of growth, poverty and employment in Uttarakhand. With the help of figures, he concludes that a large portion of the workforce in the state is engaged in agriculture where the real earnings has declined over time as a result of which there has been a very high frequency poverty rate. The pattern of growth in employment has however been distress-driven where agriculture remains the last resort. With the time especially in the rural areas there has been a structural shift in the employment regime from primary to tertiary sector, but this is mostly seen in the male fraternity. To create remunerative opportunities from the primary sector it is important first to improve the agricultural productivity in the hilly regions through diversifying the farmers market from subsistence to commercial.

2.2 DISASTER AND THREAT TO BASIC AMENITIES

India witnessed several hazard events such as earthquakes in Uttarkashi, Bhuj, Kashmir, floods as recurring in almost all hilly states,

landslides, dry spells, which led to serious impacts on the Critical Infrastructure and thereby on the functioning of the society (NIDM and GIZ 2013). The numbers of people needing water and sanitation following a disaster are much higher than the number of people killed, injured, displaced, or needing medical attention (UNICEF 2006).

In context to the natural disaster taken place in the state of Uttarakhand, majorly five districts were severely affected. Many pilgrims and tourists were stranded in the disaster hit area and its adjoining places. The rescue operations were also difficult due to destruction of infrastructure and therefore most of the rescue operation was done by helicopters and around 40 helicopters were simultaneously employed in the valley. Supplies were disrupted due to inaccessibility in 74 villages that were completely cut off leading to shortage of food supplies and need for special provision for the same. Simultaneously relief was provided under various heads like house damage, loss of life, damages to agricultural land and crops, loss of livestock, etc. as per the policies announced by the State Government, and the district administration executed them (**Langer 2014**)

2.3 DISASTER AND AGRICULTURE

The frequency of natural disasters along with its disastrous short-term and long-term effects are increasing worldwide affecting livelihood of the people and threat to food security, which often leads to poverty, agricultural backwardness and hunger vulnerabilities. According to the report, **Agriculture and Disaster Risk (2014)** about 14% of the people in developing economies are suffering from prolonged hunger. Most people depend on agriculture and allied activities for livelihood and agricultural sector is most prone to the ill-effects of natural disaster.

Danilo and Roehlano's (2013) study is a quantitative and qualitative analysis with the available secondary data and information of impact of natural disasters particularly typhoons, floods and droughts on agriculture, food security and natural resources in Philippines. On the basis of available evidence they suggest that the impacts of natural disasters on agriculture can be direct or indirect and positive as well as negative. For example the typhoons increase the supply of water for agriculture as they are followed by rain. Another part of the finding was that affected households and areas resulting in ill-effects of natural hazards should not consider only consumption strategies like emergency food aid but also non-strategic like post disaster emergency employment.

A study conducted by **Long (1978)** on Third World Agriculture points that a systematic collection of economic data on disasters and its analysis is of a

great need and importance, because the impact of natural disasters on low income countries explains the lack of agricultural self-sufficiency. He argues in favour that the establishment of agricultural planning mechanism in natural disaster prone developing countries in order to mitigate the adverse effects of such disasters.

In India there is a marked inequality between the hills and the plains and same is the case with the state of Uttarakhand. Therefore, a well thought development strategy is required to bridge this gap between two regions. All the hilly districts in Uttarakhand have subsistence farming as their major economic activity but there are constraints like long distances between markets and place of production, unavailability of storage facilities and technology etc .

2.4 ALTERNATIVE LIVELIHOOD AFTER DISASTER

The study by **Pandey (2008)** shows that the state of Uttarakhand is one of the fastest growing states of India comprising of two hill divisions of Garhwal and Kumaun, subdivided into hilly, plains and partially hilly districts. Despite the geographical size, the state possess rare and useful resources and high potential for development. The agriculture sector in the hilly districts is dominated by subsistence farming thereby posing a constraint in the lead sector for development. The state specific resources have enormous potential for development and growth which can be achieved via infrastructure development, tourism promotion, agriculture diversification, poultry and wool based livelihood and SHG or SME.

Kumar (2005) examines that apart from its large and medium hydropower, there is potential of micro-hydropower in the state. This resource of the state can be channelized for growth and development because the state inherits a comparative advantage by generating electricity at a cheaper price in an eco-friendly manner. The hydro-electric power can also be a boon for the other interlinked sectors like agriculture, tourism and fibre-processing.

Mehta (2002) in his article focuses on the increasing population and the importance of non-farm economy. He points out that primary sector alone cannot regenerate gainful employment especially in the hilly districts of Uttarakhand. It is found that the establishment of SMBs does not require huge capital investment. The growth of the non-farm sector has been influenced by regional resources, traditional means of production and the human capital required for activities like rope making, wool-based activities possess the requisite skills. Activities like diversified farm products, fruits, milk, meat, wool and woollen products, furniture and wooden products, handicrafts can be

promoted for development. However the contribution of the non-farm economy has been remarkable in terms of full utilization of resources as well as in generation of employment opportunities.

Horticultural crops give employment opportunities for the rural and semi-urban population which ensures better livelihood security. The production of horticultural crops has been increasing highly in the past two decades through policy initiatives and good investments. Among the horticultural produce vegetables are produced in small farms and give quick returns while fruits and spices are produced on large farms and require higher initial capital and have a long gestation period. Horticulture can play a major role in the growth of agricultural sector and can increase trade, income and employment. The horticultural crops of Uttarakhand include fruits, vegetables and spices, floricultural crops, medicinal and aromatic plants. Development in the horticulture sector can help in boosting the income of the farmers at the subsistence level.

2.5 ALTERNATIVE USE OF VILLAGE AMENITIES

A report published by **All India Disaster Mitigation Institute (2013)** meticulously examines that though the disaster was inevitable, however the disaster can be considered as an opportunity to change track and direct the state towards a wider spread of growth. By using proper state-specific rare and unique resources, like use of solar and wind power, additional forestry plantations, thereby making Uttarakhand a model to the rest of the hilly states of India.

“Employment is indispensable if post-disaster recovery is to be sustainable.” **Nishimoto (2016)** contributes to the fact that the disaster risk management especially in disaster-prone nations should be employment-led. The paper acknowledges that an inclusive recovery programme needs to incorporate the gender, disability, informal economy and micro-enterprise dimensions of employment to ensure emergency occupation. With special reference to the Uttarakhand disaster 2013, the key findings pertaining to the employment sector was provision of a national employment guarantee scheme that can quickly mobilize the initial support for employment generation. There is a lack of accurate loss and damage estimates and most important the proper functioning of micro and small enterprises. However the private sector played an important role by initiating key employment generation activities.

As majority of the people are employed in the primary sector though contributing the least amongst the other sectors at present, after the disaster the main and biggest challenge that prevails is of restoring the lives and

livelihood of the families that have lost their basic amenities and the access to it. **Chopra (2014)** points that there are crops in the state that grow in special and limited locations due to agro-ecological suitability, they include medicinal, aromatic plants, spices, and minor millets. Since there is comparative advantage, the state can diversify agriculture sector and this can be channelized towards the growth of the economy

Pachauri (2014) in his article points out the much debated human-animal conflict by segregating into four major categories: competition for space, crop raiding and destruction, attacking the livestock, and injury or death of humans. **Ogra & Badola(2008)** examines the economic losses and opportunity costs due to human-wildlife conflict. Conflict occurs when wildlife requirements overlap the requirements of human populations.

III. RESEARCH METHODOLOGY

3.1 MAIN OBJECTIVES:

- (i) To find the ground realities of village amenities available in the sampled villages.
- (ii) To prepare thematic maps using GIS to understand the possibility of optimal use of existing amenities in some selected villages and suggest for better alternative .
- (iii) To identify the possibilities of alternative livelihood post disaster in the sampled villages under circumstances of human animal conflict
- (iv) To identify the possibilities of alternative livelihood post disaster in the villages under circumstances of available amenities.
- (v) To identify the possibilities of alternative livelihood post disaster in the villages especially under circumstances of available regional specific resources and comparative advantages.
- (vi) To find how the available village amenities and comparative advantage of selected resources that may help in alternative livelihood .
- (vi) To highlight some special cases of village with special threat of livelihood and basic amenities if any.

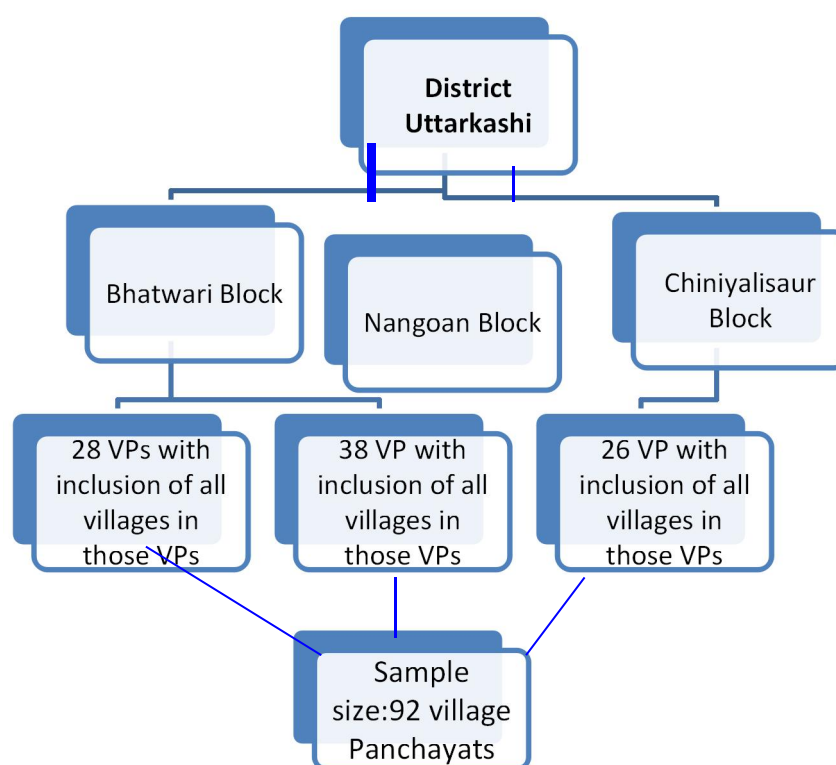
3.2 DATA: The Study is based on both primary and secondary data

Secondary sources of data includes : Uttarkashi Directorate of Economics and Statistics, DMMC Uttarkashi, Gram Panchayat Vibhag Uttarkashi, Vidhan Bhavan, Joshiyara.

For Primary data collection the sampling frame was as follows

3.3. SAMPLING:

Figure 3.1: A glimpse of sampling frame



Note: Based of list of Village Panchayats (VP) as provided from various departments of Uttarkashi in 2016.

3.4 SAMPLING METHODS:

1st stage :District Level : purposive Sampling ,Justification :
Uttarkashi is the most disaster prone district in Uttarakhand and
comes under Zone V

2nd stage: Block level, purposive Sampling based on Disaster Reports

3rd stage: Quota sampling based on representation and disaster
reports in due consultation with various district level departments
at Vidhan Bhavan ,Joshiyara, Uttarkashi

3.5 METHODS OF PRIMARY DATA COLLECTION

(i) **Village Panchayat information Schedule** for each sample village
panchayat. In each VP , all villages were covered

(ii)**Focus Group Discussion:** Village panchayat level FGD with
representation from village households, representation of both the
gender, representation of age group of working men and women .

(iii)**Experience survey** : ES with panchayat pradhan, BDO,
administrative officers of employment and livelihood and related
departments .

Some major Indicators of village amenities: Nearest schools by
type, nearest bank, nearest healthcare centre, nearest market by
type, nearest medicine shop, nearest post office, mode of available
transport, electricity, drinking water, average nature of latrine type,
hotels, irrigation facility, availability of SHGs etc.

3.6 ANALYSIS TOOL: Descriptive statistics, GIS Mapping

IV ESTIMATION OF THE VARIABLES AND ANALYSIS

Uttarakhand is known world over for its rich and diverse natural bio-resources and also the frequency of occurrence of natural disasters. In order to utilize these natural resources in a sustainable manner, it is important that resources be harnessed efficiently to meet the people's development aspirations and thereby generating alternative livelihood options. The economy of Uttarakhand primarily depends on agriculture and tourism for livelihood. About 70%¹ of the population is engaged in the primary sector.

ANALYSIS-1

BASED ON SECONDARY DATA

**Table 4.1 - Before Disaster and After Disaster Scenario in Uttarkashi district:
Some select parameters**

S No.	Items	Unit	Before Disaster		After Disaster	
			Duration	Description	Duration	Description
1	2	3	4	5	6	7
1	Geographical Area	KM ²	2001	8016	2014-15	8016.05
2	Police Station					
2.1	Rural	In Numbers	2011-12	3	2014-15	4
2.2	Urban	In Numbers	2011-12	2	2014-15	2
3	Bus Station/Bus Stop	In Numbers	2011-12	301	2014-15	301

¹Source : District Statistics Handbook, Uttarkashi, 2011-12 and 2014-15

S No.	Items	Unit	Before Disaster		After Disaster	
			Duration	Description	Duration	Description
1	2	3	4	5	6	7
4	Post Office					
4.1	Urban	In Numbers	2011-12	5	2014-15	9
4.2	Rural	In Numbers	2011-12	125	2014-15	121
5	Telegraph Office	In Numbers	2011-12	1	2014-15	0
6	Telephone Connection	In Numbers	2011-12	8558	2014-15	8564
7	Commercial Bank					
7.1	Nationalized Bank Branches	In Numbers	2011-12	29	2014-15	38
7.2	Other	In Numbers	2011-12	15	2014-15	15
8	Rural Bank Branches	In Numbers	2011-12	6	2014-15	7
9	Cooperative Bank Branches	In Numbers	2011-12	15	2014-15	15
10	Cooperative Agricultural and Village Development Bank Branches	In Numbers	2011-12	1	2014-15	--
11	Ration Shop					
11.1	Rural	In Numbers	2011-12	520	2014-15	530
11.2	Urban	In Numbers	2011-12	13	2014-15	12
12	Biogas Plant	In Numbers	2011-12	539	2014-15	576
13	Cold Storage	In Numbers	2011-12	--	2014-15	--
14	Agriculture					
14.1	Net Cropped Area	In Thousand Hectare	2010-11	30	2013-14	29
14.2	Area with more than one crop	In Thousand Hectare	2010-11	15	2013-14	11
14.3	Net Irrigated Area	In Thousand	2010-11	4	2013-14	4

**SSS PROJECT : A STUDY ON POSSIBILITIES OF ALTERNATIVE
LIVELIHOOD ACTIVITIES AND UTILIZATION OF AVAILABLE
AMENITIES POST-DISASTER: A CASE STUDY OF UTTARKASHI**

2016

S No.	Items	Unit	Before Disaster		After Disaster	
			Duration	Description	Duration	Description
1	2	3	4	5	6	7
		Hectare				
14.4	Net Irrigated Area	In Thousand Hectare	2010-11	8	2013-14	8
14.5	Agricultural Production					
14.5.1	Food	In Thousand Metric tons	2010-11	59.55	2013-14	52.01
14.5.2	Sugarcane	In Thousand Metric tons	2010-11		2013-14	--
14.5.3	Oilseeds	In Thousand Metric tons	2010-11	0.9	2013-14	0.8
14.5.4	Potato	In Thousand Metric tons	2010-11	29	2013-14	22
15	Climate					
15.1	Rainfall					
15.1.2	Real	MM	2011	1228.5	2014	1176.7
15.2	Temperature					
15.2.1	Highest	°C	2011	32.0	2014	31.4
15.2.2	Lowest	°C	2011	-1.8	2014	-5.5
16	Animal Husbandry					
16.1	Total Livestock	Number	2007	347563	2012	365718
17	Cooperation					
17.1	Starting Agriculture Loan Committee	Number	2011-12	44	2014-15	44
17.2	Committee Members	No. in Hectors	2011-12	73	2014-15	59
18	Industry					

S No.	Items	Unit	Before Disaster		After Disaster	
			Duration	Description	Duration	Description
1	2	3	4	5	6	7
18.2	Khadi Industry and Small Industrial Unites					
18.2.1	Numbers	Number	2011-12	424	2014-15	611
18.2.2	Working People	Number	2011-12	1593	2014-15	2381
19	Education					
19.1	Junior Basic School	Number	2011-12	977	2014-15	966
19.2	Senior Basic School	Number	2011-12	368	2014-15	327
19.3	Inter College	Number	2011-12	115	2014-15	147
19.4	College	Number	2011-12	3	2014-15	3
19.5	Post-Graduation College	Number	2011-12	2	2014-15	2
19.6	University	Number	2011-12		2014-15	0
19.7	Industrial Training Unites	Number	2011-12	6	2014-15	7
19.8	Polytechnic	Number	2011-12	2	2014-15	4
20	Public Health					
20.1	Hospital and Dispensary					
20.1.1	Allopathic	Number	2011-12	22	2014-15	22
20.1.2	Ayurvedic	Number	2011-12	52	2014-15	52
20.1.3	Homeopathic	Number	2011-12	9	2014-15	9
20.2	Primary Health Center	Number	2011-12	11	2014-15	11
20.3.1	Community Health Center	Number	2011-12	3	2014-15	4
20.3.3	Family and Maternal Child Welfare Sub-center	Number	2011-12	82	2014-15	82
21	Length of Paved Roads					
21.1	Total Length of Roads	KM	2011-12	1299.20	2014-15	1669.08

S No.	Items	Unit	Before Disaster		After Disaster	
			Duration	Description	Duration	Description
1	2	3	4	5	6	7
21.2	Length of Road by Lok Nirman Vibhag	KM	2011-12	1101.25	2014-15	1499.28
22	Electricity					
22.1.1	Total Electrified Villages	Number	2011-12	668	2014-15	672
22.1.2	Electrified Habitat Villages	Number	2011-12	668	2014-15	672

Source: Compiled from the District statistical handbook 2011-12 and 2014-15.

Uttarkashi has faced unprecedented recurring disasters over time. The disaster led to increased human tragedy along with immense loss of infrastructure and loss of accessibility to basic amenities. The present study reveals that during the span of pre and post disaster, there have been some changes in the availability and accessibility to the basic amenities in the disaster struck district

The major loss that has been documented post disaster is the loss of school infrastructure, loss of agricultural land, agriculture production, post offices, telegraph offices and variations in climate and rainfall.

In rural areas the advent of technology has not been widespread and obsolete means of communication are still prevalent. Past evidences showed that the information regarding the upcoming disaster could be spread to the villages and therefore the unprepared villages. As the data shows there has been a loss of telegraph office also.

There are many other costs and effects allied to this macro losses. All these losses are quite direct , however they result in changes in the economic flows like there is definite loss of production, after these losses, there are higher

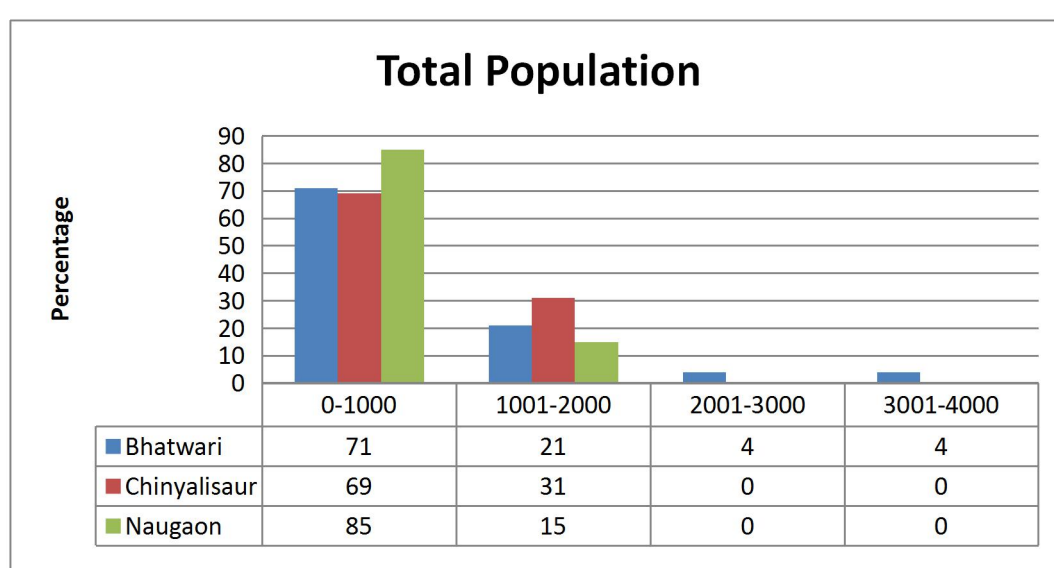
costs of raw materials and inputs to recover, there is increased operational costs and lower returns. The loss of agricultural production which is one of the two major livelihood options in the district can be summarized as the loss of potential income of the farmers. The changing climatic environment today is a major cause of concern and is now the greatest environmental challenge faced by the world today. Climate change is projected to have significant impact on conditions affecting agriculture, including temperature precipitation and glacial run off.

During the survey and through literature it was noticed that accessibility to the affected villages was one of the major hurdles due to damage of road infrastructure. The data shows a contradicting yet appealing picture that the post disaster scenario is that there has been an increment in the length of roads i.e. 1101.25km during the disaster and 1499.28km post-disaster. Based on the data it may be said that the speedy construction of roads post disaster is a welcome sign for the district.

ANALYSIS

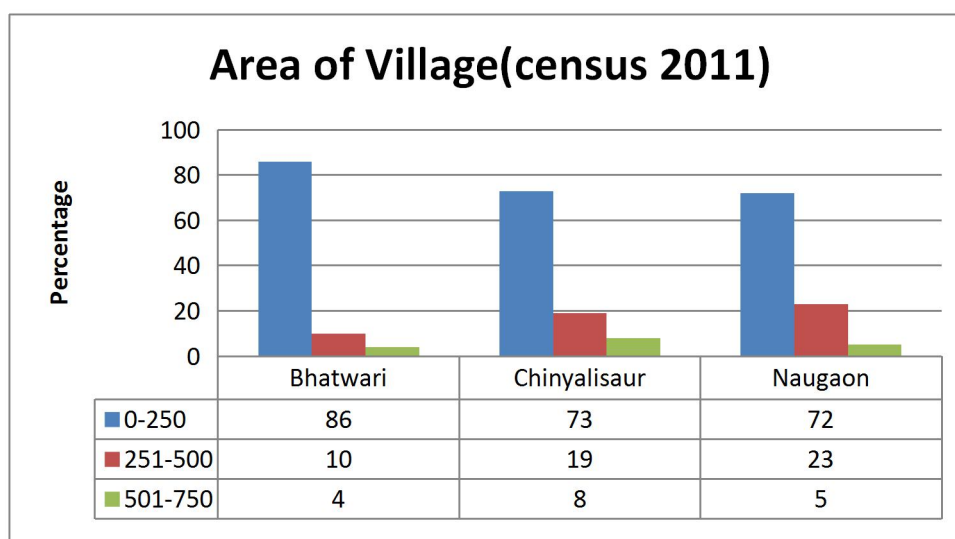
PRIMARY DATA

Figure 4.1 Ranges of population in the sampled Villages of sampled blocks



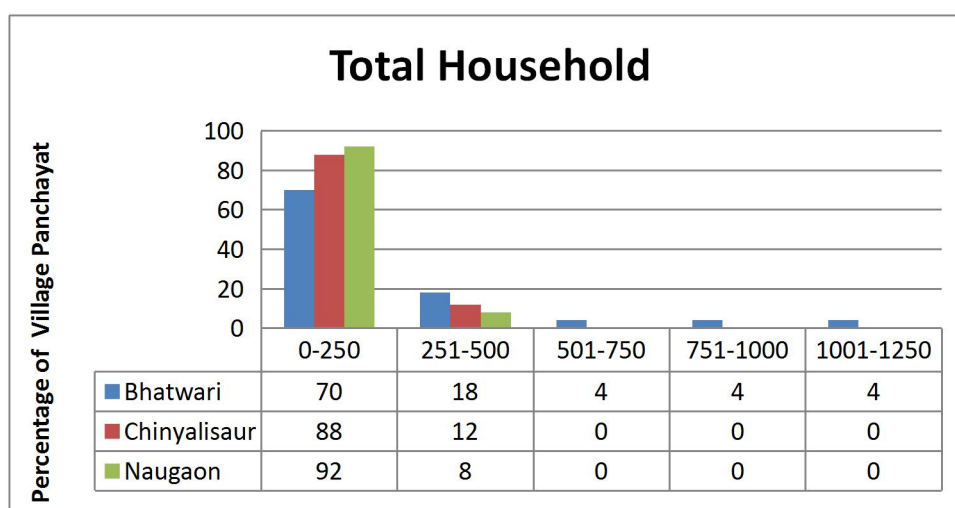
The population of a village and population density plays a very important role in determining the policy framework. During our research it was observed that most of the population in the villages of the three blocks lies within the range of 0-1000 and very few lie with the range of 1001-2000. Another observation was that in Bhatwari block, one village in the block had population in the range of 2001-3000 and 3001-4000 respectively. On an average the population of the villages lied within 0 to 2000.

Figure 4.2: Categories of village area(in ha) in the villages of sampled block



The area details of the villages are important because they indicate many correlated parameters. In Uttarkashi district landholdings are small. As per the census data, the areas of the villages of the sample villages mostly are up to 250 sq hectares. Very few villages i.e. 10%, 19% and 23% of the respective blocks have area falling within 250-500 sq. hectre range.

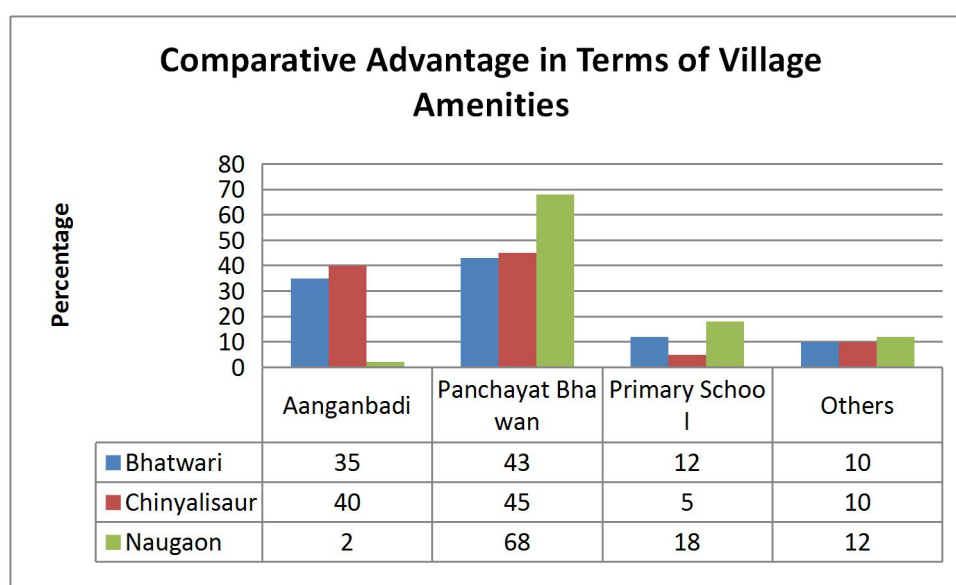
Figure 4.3: Number of total household categories in the villages of the sampled blocks



The above graph shows the total households range in different villages of the blocks.

In Bhatwari block, only 4% of villages showed the number of households are distributed over to the range of 1001-1250, though maximum range i.e. 70% lies between 0-250 and 18% lies within 251-500. In the other two blocks, the range of households is also maximum in the range 0-250 i.e. 88% and 92% for Chinyalisaur and Naugaon respectively. Basically most of these villages have household below 100 as evident from field survey.

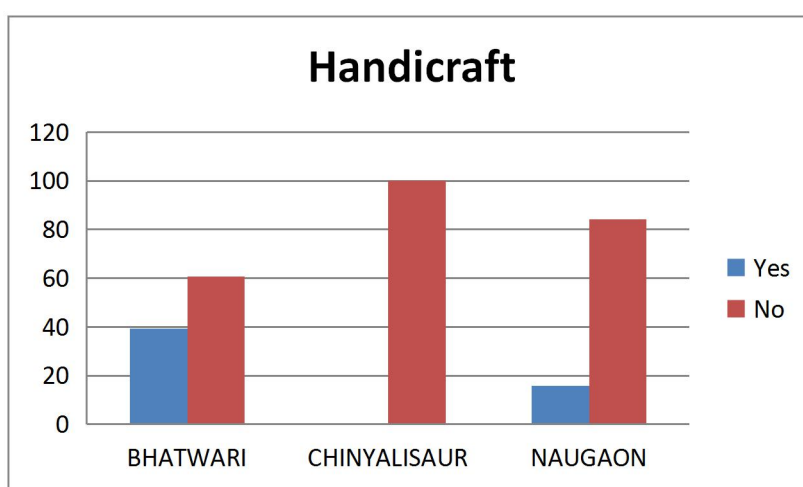
Figure 4.4: Percentage of villages reporting comparative advantage in village amenities in the blocks



One of the major concerns especially in a disaster-prone area is that of the availability of the basic amenities in the villages. Besides the basic amenities there can be efficient use of partially idle amenities. Most villages enjoy huge comparative advantage of having alternative amenities. Villages in Bhatwari, Chinyalisaur and especially Naugaon block make maximum use of the Panchayat Bhawans for varied purposes. Similarly 35% and 40% of the villages in the Bhatwari and Chinyalisaur enjoy comparative advantage of utilizing Anganbadi schools for other purposes. Similar is the case of primary schools, since the buildings are left idle after the classes, the villagers use the buildings for purposes like making them part-time centres for alternative livelihood, providing skill development centres for the youth, self-employment units, storage purpose, shelters during emergencies, etc. besides the mentioned

amenities, villages in the Naugaon block make use of the Temples for holding important meetings or for training purposes. Few villages of the Bhatwari block have a proper road transport system which links them to the market and other villages. On the other hand there were villages which did not have any comparative advantage in terms of village amenities, but were supported by the adjacent villages.

Figure 4.5 : Whether Handicraft is an Existing Alternative Livelihood Option [EALO] in the villages in the block



The figure 4.5 shows the response of the sampled villagers from the sample blocks whether handicraft is an existing alternative livelihood option or not. As the graph shows that in all blocks most of the respondents deny that handicraft is not an alternative livelihood option, whereas very few of the villagers agreed that handicraft is an effective livelihood option. In Chinyalisaur as the graph depicts, 100 percent of the villages are of the view that handicraft is not an alternative option. Bhatwari is one block where to some extent; handicraft is being used as an alternative option. However during the survey it was found that there is awareness among the people and with the proper assistance and training handicraft can be an effective and efficient livelihood opportunity. In Naugaon also there is some option of handicraft as alternative livelihood.

Figure 4.6: Whether animal husbandry is an alternative livelihood option in the sampled villages of the blocks

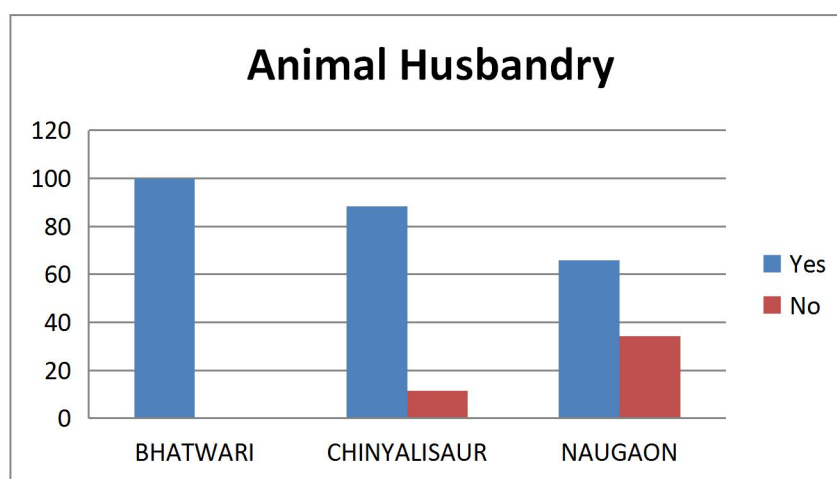
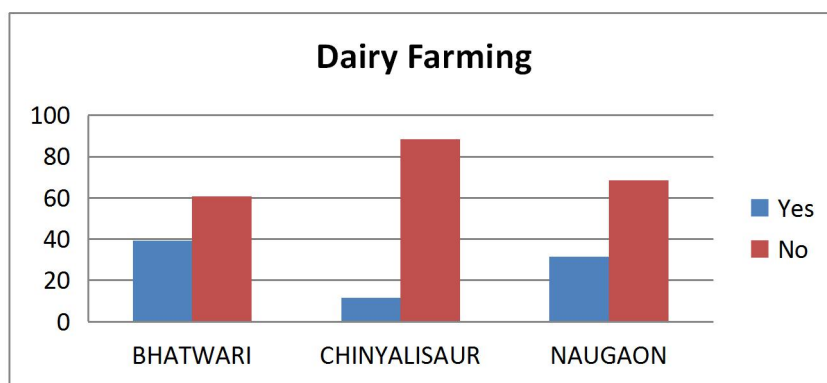


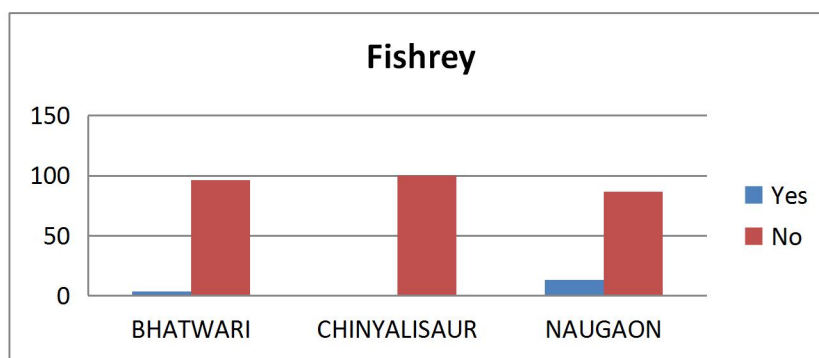
Figure 4.6 shows the response of the sampled village panchayats to animal husbandry as an existing livelihood option. From the results it is clear that the majority of the sample villagers practice animal husbandry as an effective alternative livelihood option. It is seen that the entire sample of the Bhatwari block and 90% of the sample of Chinyalisaur and almost 70% in Naugaon have animal husbandry as a major livelihood option for Uttarkashi because it is associated and interlinked with a number of other sustainable options like the cattle can be used for dairy farming, butchery, extracting wool for women knitting, and many others. It can be concluded that animal husbandry is a multi-faceted and very efficient alternative livelihood option.

Figure 4.7: Whether dairy farming is an alternative livelihood option in the sampled villages of the blocks



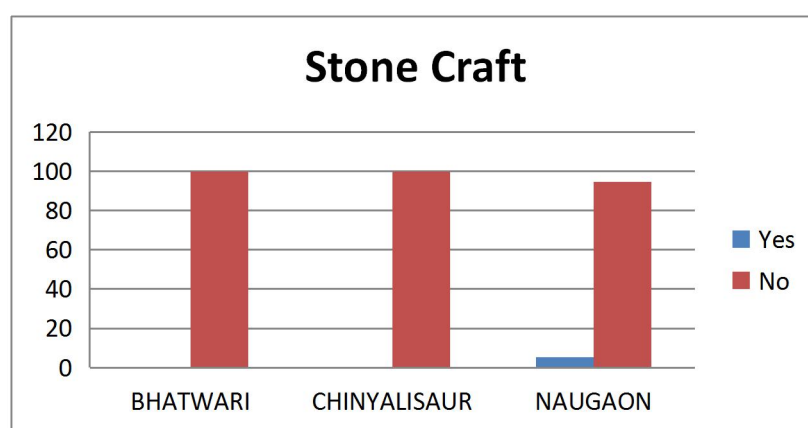
With reference to existing livelihood option, 40 percent of sampled villages agreed that animal husbandry is an effective alternative option, majority of the people did not approve of dairy farming as an existing option. However few villages in the Bhatwari block and few of Naugaon practice dairy farming as a complementary livelihood option. If a centralized dairy is set up it will not only benefit the cattle owners but also the consumers and distributors. Citing the example of Amul the respondents were very keen in setting up a cooperative society for setting up a market for dairy products in a wide range.

Figure 4.8 Whether fishery is an alternative livelihood option in the sampled villages of the blocks



Pisciculture can be a very good substitute livelihood option if marketed properly. Almost all the villagers (96%) do not take fishery as a prevailing alternative livelihood option and only as much as 4% have taken up pisciculture. This response was directly related to the distance of suitable water resource which was very far and to a certain extent the awareness of the villagers towards the art of fish farming. A few villages in the Naugaon block have been exposed to this unpopular art of fish farming, with the help of some non-governmental organizations. However in some areas trout farming has been initiated with the help of Department of Fishery.

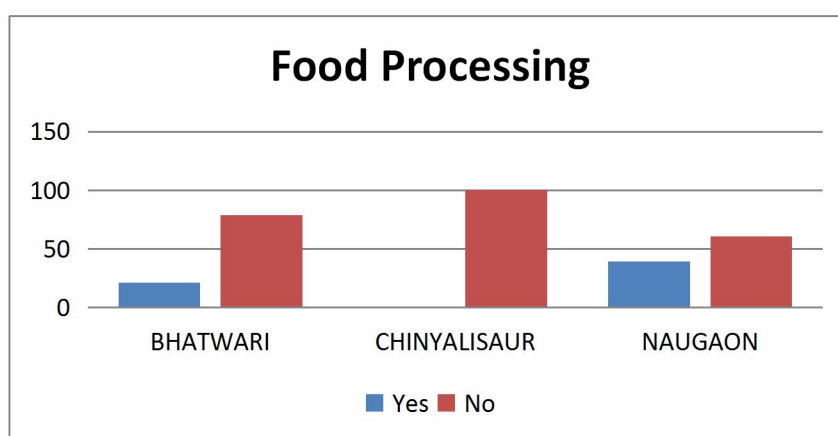
Figure 4.9 Whether stone craft is an alternative livelihood option in the sampled villages of the blocks



As the results evidently show, that nearly 100% of the respondents do not practice stone craft as an alternative livelihood option. During the survey it was established that the respondents did not think that stone craft could be an effective alternative option, more so because one needs to inherit the art of carving and creativity and also has to have the associated knowledge about the stones. Along with the unawareness towards this livelihood option, there is not even a remote possibility of setting up of training centers for stone craft.

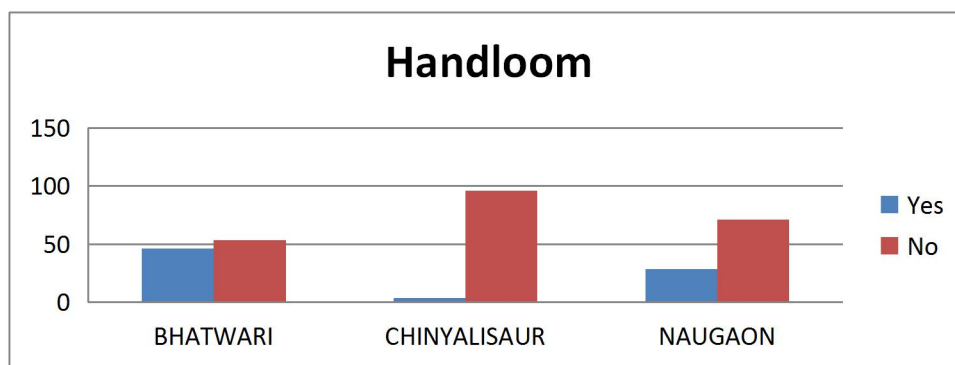
However in Naugaoan block some possibilities were visible. A NGO called 'Jaddi' has already initiated the programme of stone crafting but in a small scale.

Figure 4.10 Whether food processing is an alternative livelihood option in the sampled villages of the blocks



79% of the respondents of Bhatwari and entire sample villages did not contemplate that food processing is an existing livelihood option, and only 21% of the respondents of Bhatwari and 39.47 percent of Naugaon block consider food processing as alternative employment opportunity. Uttarkashi is blessed with abundant resources and during the survey it was observed that setting up of a food processing unit can generate good employment opportunities and will also help in effective utilization of the resources. However the sampled village panchayats in Chinyalisaur did not consider that food processing can be an alternative livelihood option.

Figure 4.11 Whether handloom is an alternative livelihood option in the sampled villages of the blocks



Handloom is majorly taken up by the women of the region and is a very progressive livelihood option. However on an average, most of the respondents do not agree that handloom is not an existing alternative livelihood option, although majority of the sample villagers opined that taking handloom is an efficient choice. The results are suggestive of the fact that in Bhatwari almost 50% of the samples do handloom related jobs and it was also found that almost all women were in favor of taking handloom as a livelihood option. However, handloom is not an existing livelihood option in the other two blocks.

Figure 4.12 Whether Poultry is an alternative livelihood option in the sampled villages of the blocks

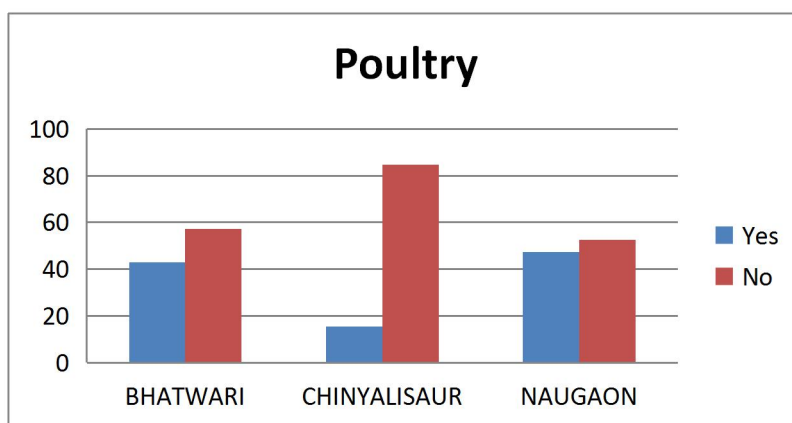
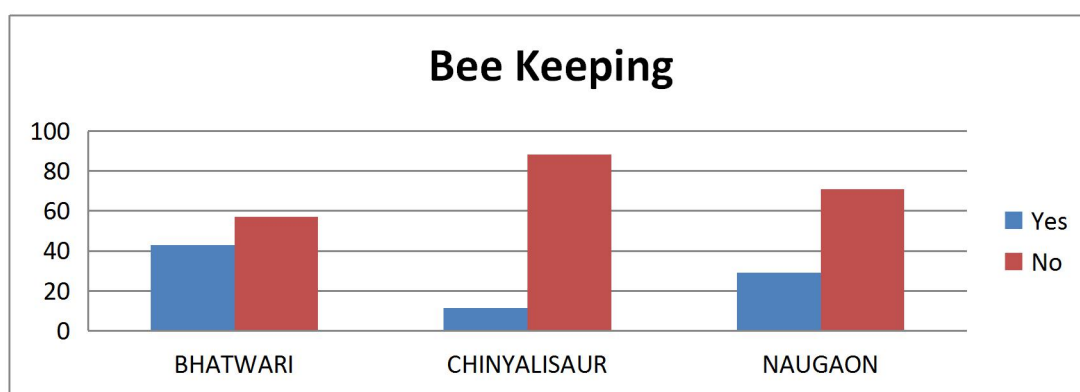


Figure 4.12 shows the response towards poultry as an existing livelihood option. The results do not show much variation for poultry as an existing livelihood option in Naugaon and Bhatwari blocks. On the contrary in Chinyalisaur in 85% of the sampled villages, poultry is not an existing employment option.

Figure 4.13 Whether Bee Keeping is an alternative livelihood option in the sampled villages of the blocks



During the survey it was found that there are many bee hives and bee keeping is being used for subsistence needs. Figure 4.13 shows that on an average majority of the villages do not have been keeping as a source of livelihood. 43% of the villages in Bhatwari and a few more in Chinyalisaur and Naugaon have commercialized bee keeping and have it as a substitute livelihood option. However, if the positive response of the villagers is effectively channelized, it will not only create employment opportunities but also create awareness

among the adjacent neighborhood villages and bee keeping can be taken up at commercial level.

Figure 4.14 Whether Mule owning is an alternative livelihood option in the sampled villages of the blocks

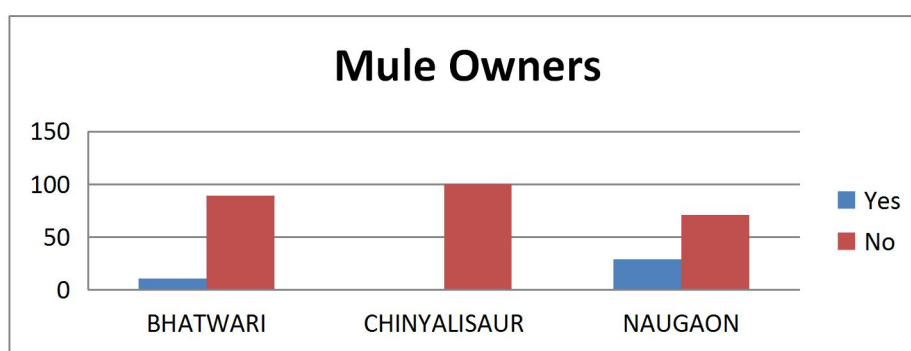
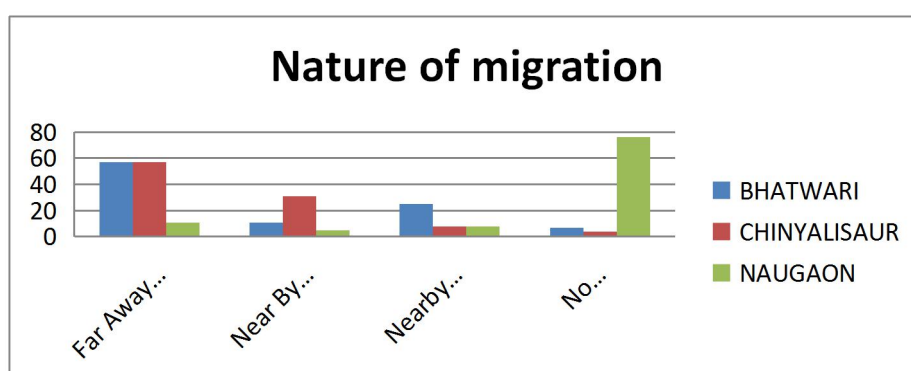


Figure 4.14 shows that 89% of the respondents donot believe that owning mule(s) can be an effective alternative option. However 11% who agreed said that mules can be used for transportation purposes since the road connectivity is poor. Otherwise it can supplement if tourism prospects are augmented in the area.

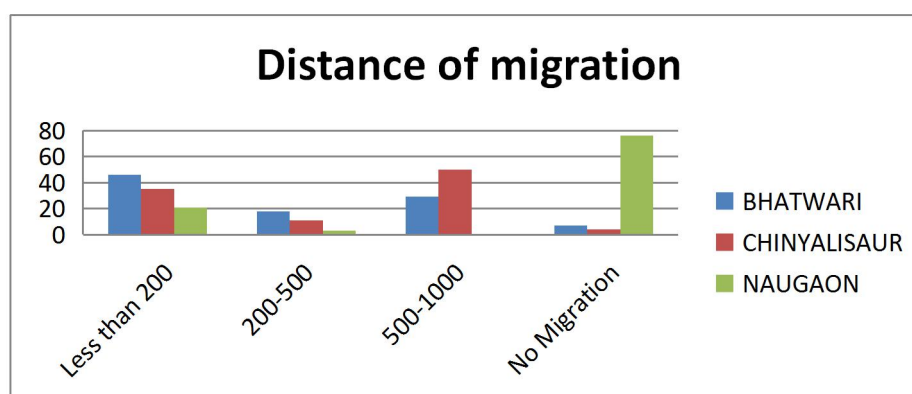
MIGRATION RELATED VARIABLES

Figure 4.15 Nature of migration in the sampled villages of the blocks



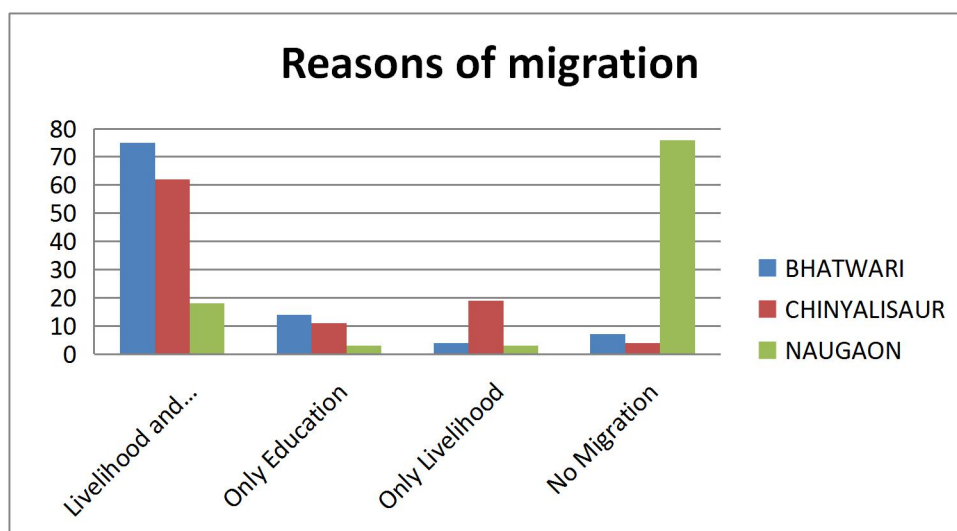
Migration is an ongoing phenomenon in the hilly districts of Uttarakhand. During the survey the nature of migration and related parameters were explored. As the results show that in Bhatwari and Chinyalisaur both, most of the people migrate to far away town. In Bhatwari 25% people migrate to nearby town and 11% of the people go to nearby village and market, Chinyalisaur data on the other hand show that 31% of the villagers migrate to nearby village and market and 8% to the nearby town. As the data suggests that the people are either migrating to some distant place or to some nearby village or town where they get access to the basic amenities. Only 7% and 4% of the villages of Bhatwari and Chinyalisaur respectively have not encountered any migration, on the contrary, Naugaon has shown an amazing result of no migration (76%).

Figure 4.16 Average distance of migration in the sampled villages of the blocks



In reference to the nature of migration, the Figure 4.16 shows the distance of the faraway town or nearby village. As the data shows 42% of the people have migrated to places that are less than 200kms from their villages, 18% have migrated to places with the range if 200-500kms and as much as 29% of the villagers have migrated to places that lie within 500-1000km range.

Figure 4.17 Reasons of migration in the sampled villages of the blocks



Majorly people migrate from one place because of inaccessibility of adequate resources to a place where they get access to basic amenities. Figure 4.17 shows the reasons behind migration in the study area. As the graph clearly depicts that the main reason behind migration is both, lack of livelihood options along with desired education facilities for their children and 75% of the people are migrating because of both these reasons together. However, 14% are migrating only due to education facilities and 4% are migrating only because of livelihood options.

Figure 4.18 Existence of SHG/SamooH in the sampled villages of the blocks

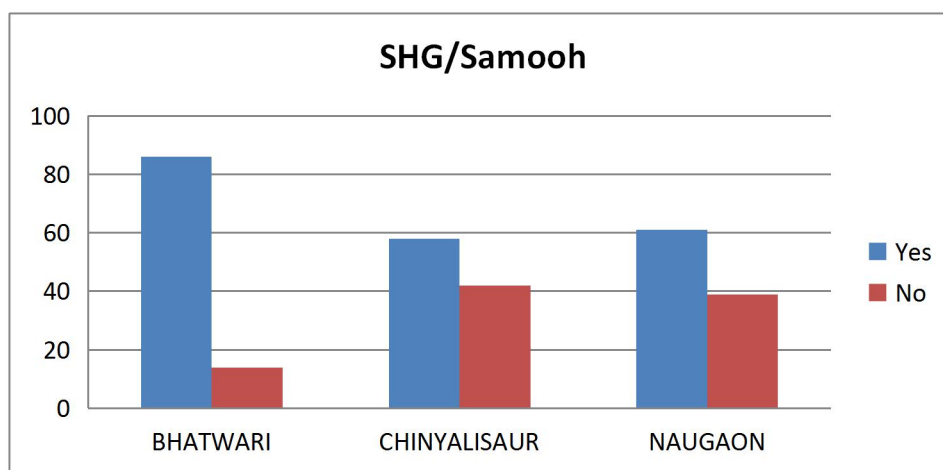
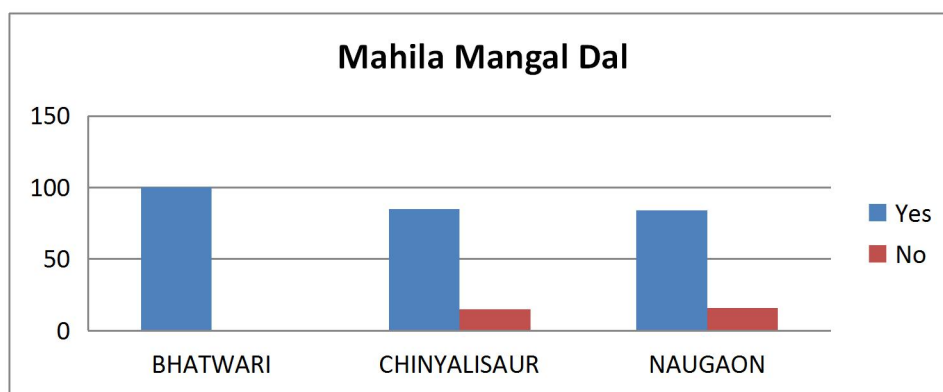


Figure 4.18 Existence of 'Mahila Mangal Dal' in the sampled villages of the blocks



The CBOs have a huge role to play in community development . Except a few villages in Chinyalisaur and Naogoan, Mahila Mangal Dal were present in villages but survey revealed that those were not active or rather functional except a few villages.

Figure 4.19 Existence of 'Hariyali' in the sampled villages of the blocks

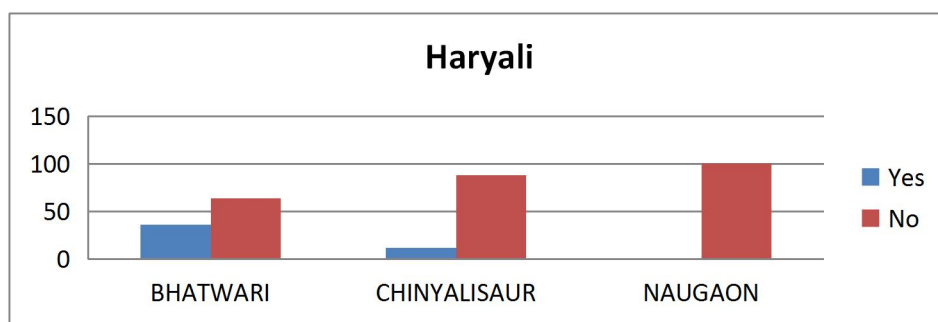
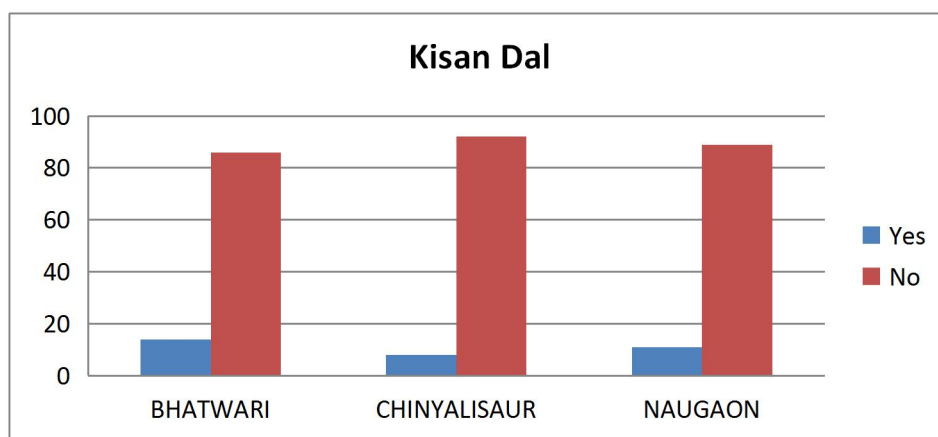


Figure 4.20 Existence of '*Kisan Dal*' in the sampled villages of the blocks



From Figure 4.19 and Figure 4.20 it is evident that '*Haryali*' and *Kisan Dal* in villages are very few in numbers and also not dynamic in their working process.

Figure 4.21 Existence of '*Yuvak Mangal Dal*' in the sampled villages of the blocks

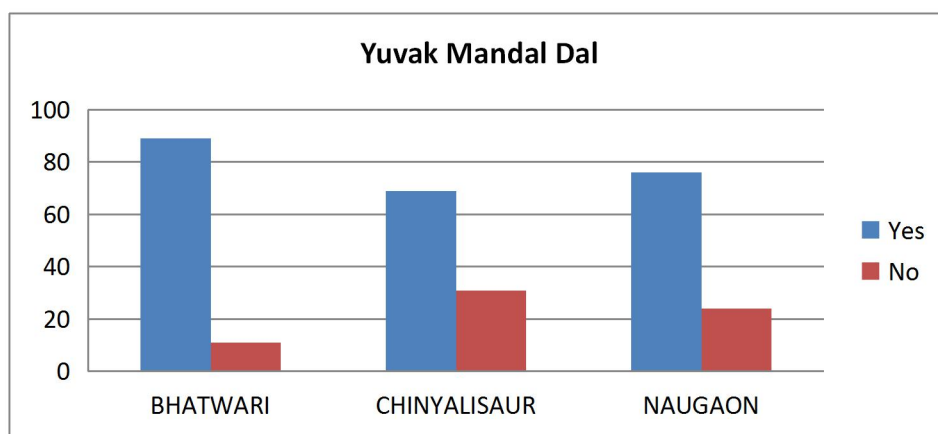
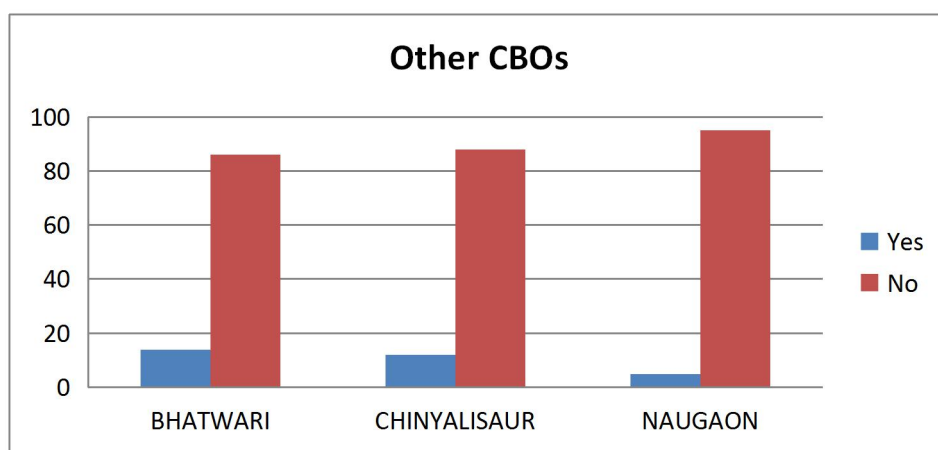
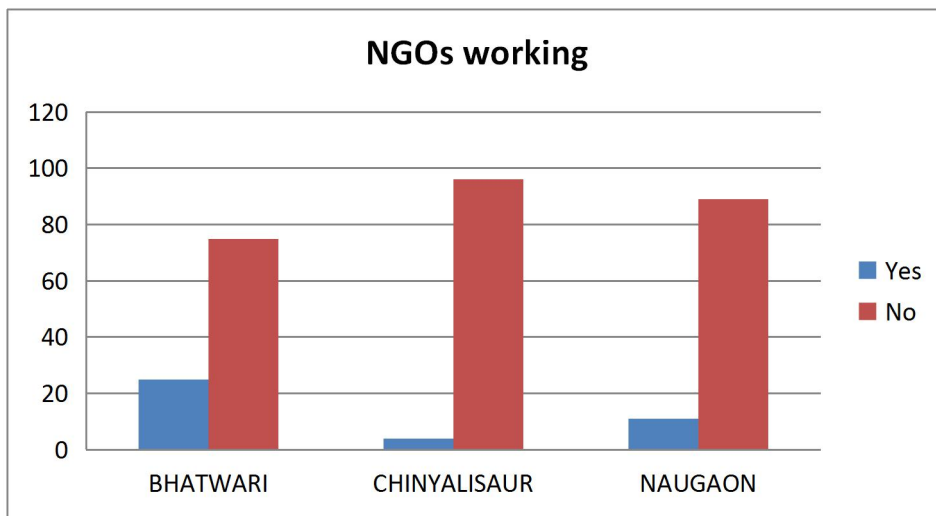


Figure 4.22 Existence of other CBOs in the sampled villages of the blocks



Yuvak Mangal Dal has been formed in most villages and are working to mobilize the potential of youth in the villages. Yet there is lack of motivation .Other CBOs were present in very few numbers in the blocks as evident from Figure 4.22

Figure 4.23 Whether NGOs are working in the sampled villages of the blocks for livelihood



Results show that the working of NGOs for livelihood was comparatively less in the sampled villages. However Bhatwari showed a better situation. During survey it was found that NGOs like Jaddi, SBMA are working in the area for livelihood.

POSSIBLE ALTERNATIVE LIVELIHOOD OPTIONS

Figure 4.24 Whether in the sampled villages of the blocks carpentry can be a possible alternative livelihood option[PALO]

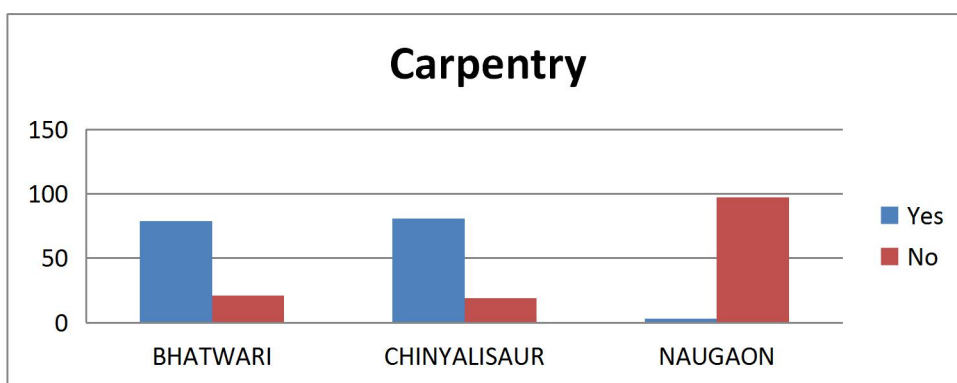


Figure 4.24 shows that 79% of the villages in Bhatwari are capable of adopting carpentry as an alternative source of livelihood. There is a huge possibility of livelihood options as a carpenter in the villages provided marketing linkages are adopted.

Figure 4.25 Whether in the sampled villages of the blocks food processing unit can be a possible alternative livelihood option[PALO]

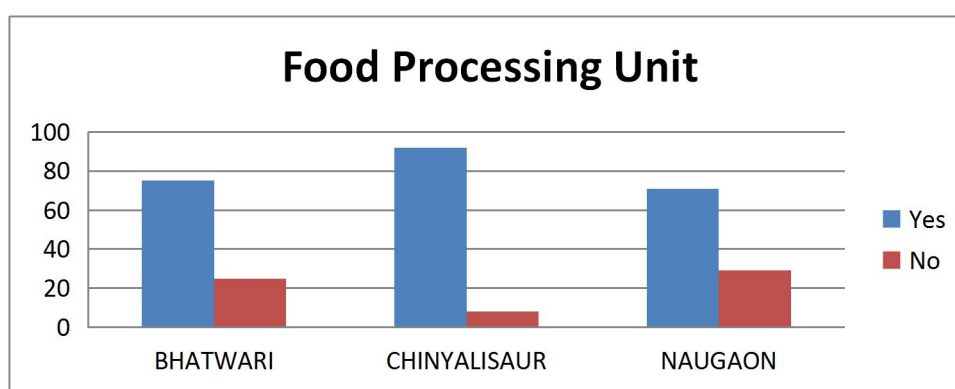
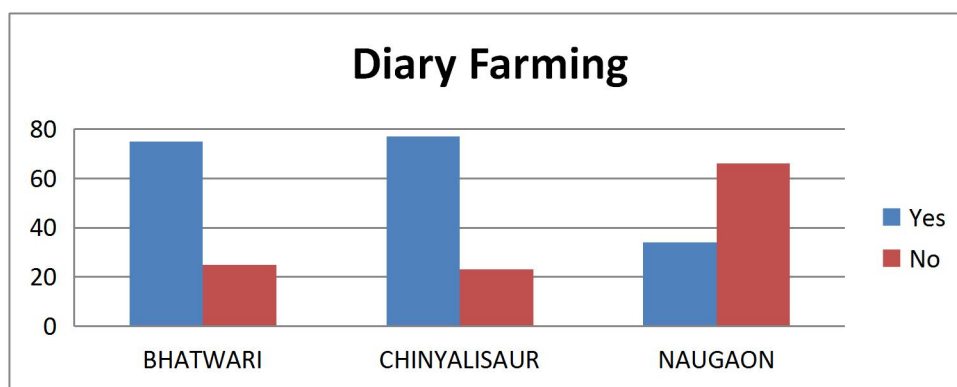


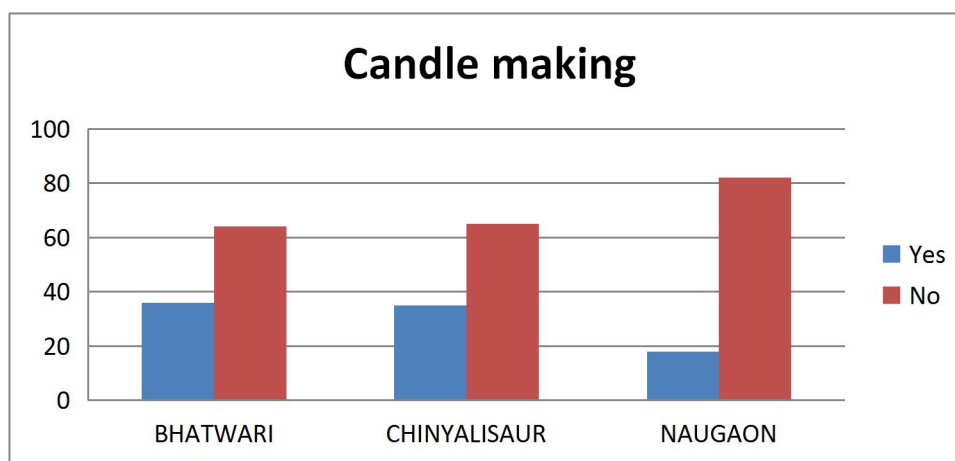
Figure 4.25 shows that there is possibility in maximum number of villages to set up a food processing unit. The setting up of a food processing unit requires mainly the raw materials, appropriate topography, manpower and financial resource. During the survey it was found that the villages are abundant in manpower and the required natural resources. So setting up of a food processing unit will be beneficial for the villagers in terms of employment opportunities, the full utilization of resources and also in the development and growth of the district as a whole.

Figure 4.26 Whether in the sampled villages of the blocks dairy farming can be a possible alternative livelihood option[PALO]



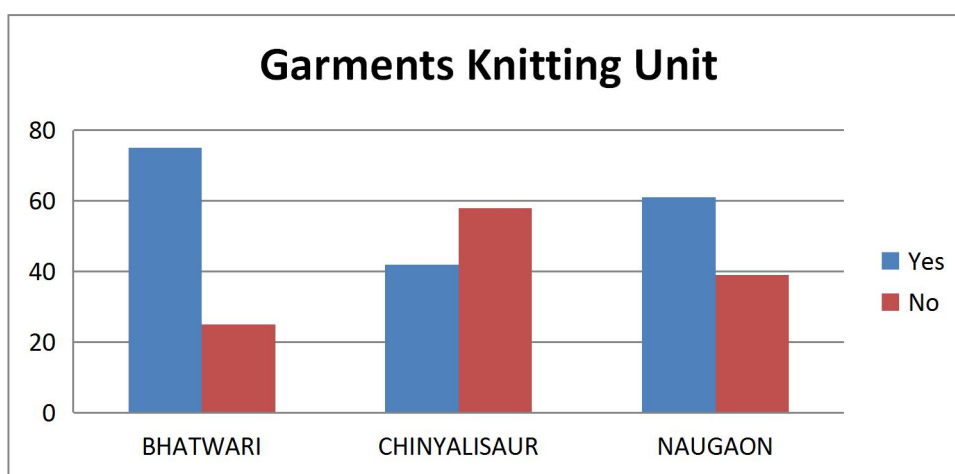
As stated earlier Dairy Farming is and will definitely prove to be a very effective alternative livelihood option. There is a possibility of setting up a centralized dairy which can be linked to the market and thereby creating a feasible opportunity for the villagers. 25% of the villages are those where there is not a possibility of Dairy Farming because either the output is low or the cattle is enough for subsistence needs, therefore the other villages can be interlinked with them and thereby benefiting both.

Figure 4.27 Whether in the sampled villages of the blocks candle making can be a possible alternative livelihood option[PALO]



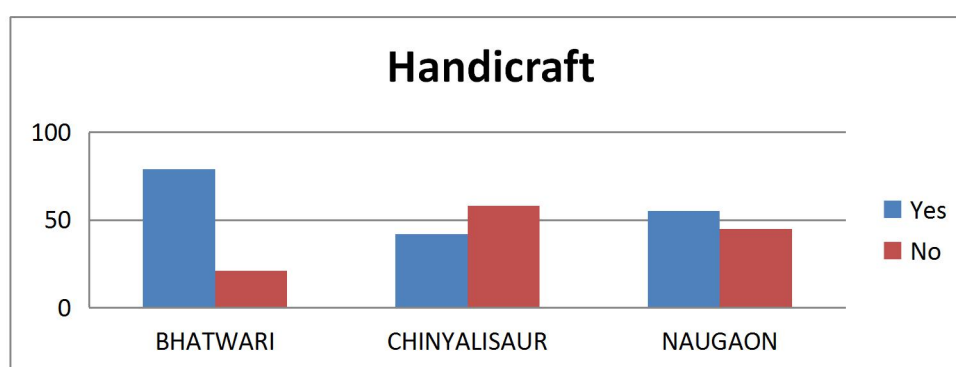
The Figure 4.27 shows that 36% of the villages have the possibility of taking up candle making as a substitute employment option. However 64% of the villages were devoid of having candle making as a livelihood option mostly because of lack of appropriate resource and also because of lack of interlinkages with the market. The main problem addressed by the villagers was the problem of getting raw material for the purpose.

Figure 4.28 Whether in the sampled villages of the blocks garment knitting units can be a possible alternative livelihood option[PALO]



Handloom is majorly taken up by the women of the region and is a very progressive livelihood choice. The results were suggestive of the fact that almost 50% of the sample agreed, and it was also found that almost all women were in favor of taking handloom as a livelihood option. As per the above graph 75% of the villages have the possibility of commercializing knitting garments. During the survey the respondents said that if a garment knitting unit is set up then it will be helpful for the exposure of the traditional art and will also provide the women with incentives in terms of marketing the product. However UHHDC has taken initiative in this direction but a huge scope still remains in sampled village panchayats.

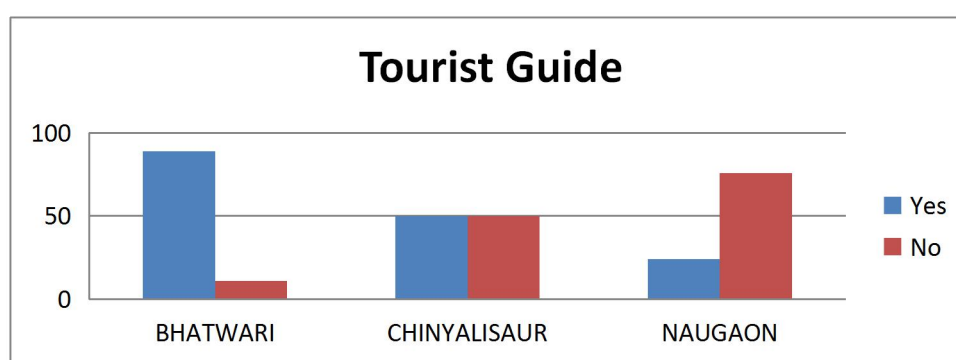
Figure 4.29 Whether in the sampled village Panchayats of the blocks handicraft units can be a possible alternative livelihood option[PALO]



Like the beauty of the state, the variety of handicrafts produced by the state is also praiseworthy. People of Uttarkashi have realized the importance of handicraft for employment purposes and in all the three blocks there was a drive witnessed towards handicraft being taken as an alternative livelihood option. The only problem that is associated with handicraft is that the sector

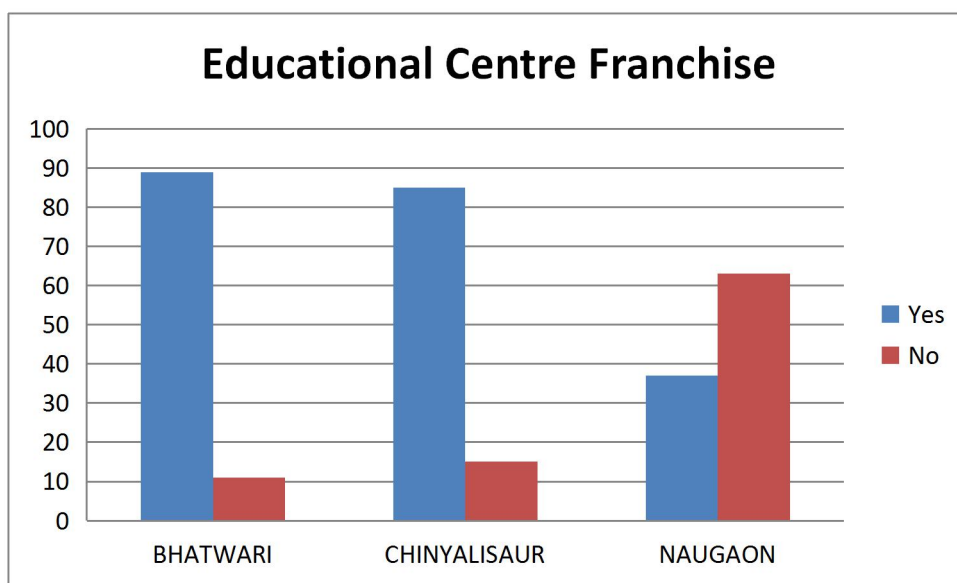
like others does not have a niche market. Relatively Chinyalisaur is one such block that lacks immense awareness and still follows traditional means on a large scale. As we can see from the above graph except Chinyalisaur, in both Bhatwari and Naugaon more than 50% see handicraft as an upcoming possibility for alternative livelihood.

Figure 4.30 Whether in the sampled villages of the blocks employment as trained tourist guide can be a possible alternative livelihood option[PALO]



There is a contradicting trend in being a tourist guide as a possible livelihood option between Naugaon and Bhatwari & Chinyalisaur. Tourist guide is mostly taken up by the young men. In the survey it was found that there is a drive among the young men of Naugaon towards working in a food processing unit as a result the result show that in most of the villages in Naugaon tourist guide is not a possibility. Whereas in Bhatwari almost 90% of the villages believe that being a tourist guide is possible alternative livelihood option. Chinyalisaur on the other hand showed a fifty-fifty ratio. However another reason being Bhatwari region stands in a very popular route of Hindu shrine of Gangotri.

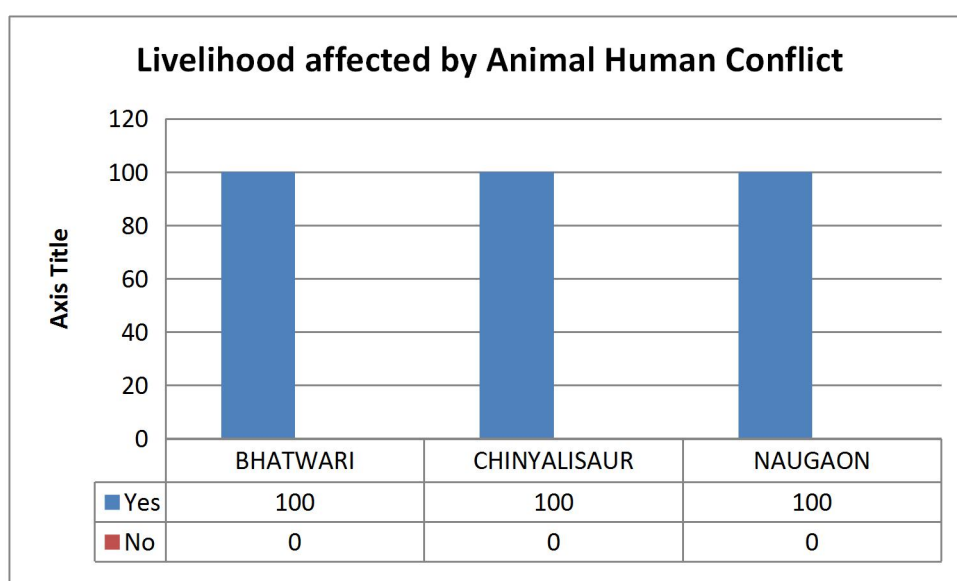
Figure 4.31 Whether in the sampled villages of the blocks employment in education centre franchise can be a possible alternative livelihood option[PALO]



This was an option that was explored after pilot survey. And it was observed that majority of the villages in Bhatwari and Chinyalisaur were of the opinion that there is a possibility while in Naugaon block the percentage was relatively less but significant.

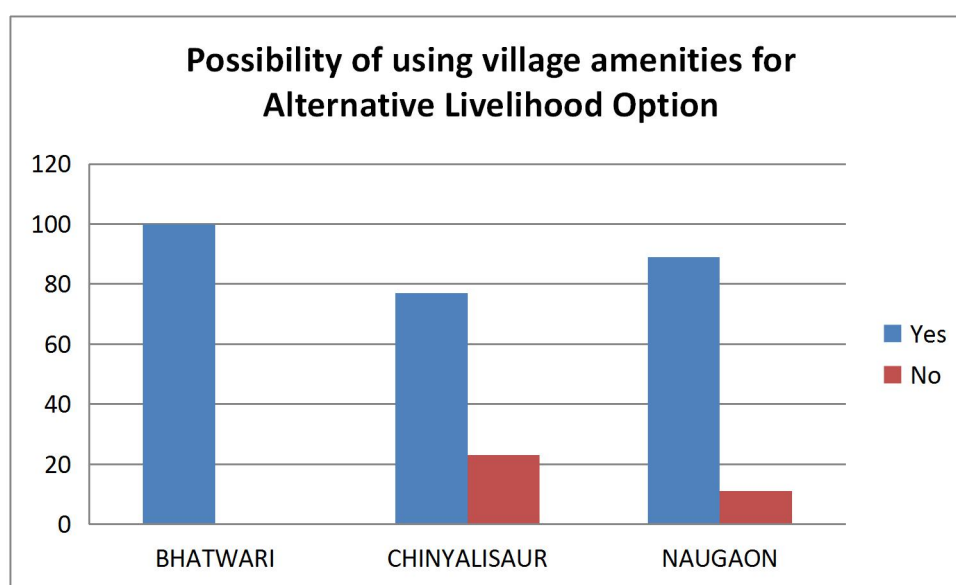
HUMAN ANIMAL CONFLICT

Figure 4.32 Whether in the sampled villages of the blocks livelihood is affected by human animal conflict



Human Wildlife conflict is a growing problem prevalent throughout mountain regions of Uttarakhand. The state has had a long history of sustainable coexistence of people with wildlife resources. However as human population expands and natural habitats shrink, people and animals are increasingly coming into conflict over living space and food. During the survey there was one similar problem being faced by villagers across the district, including the three blocks that were covered, which was the problem of human-wildlife conflict which is one of the most challenging task in wildlife conservation also. The entire sample villages are suffering from the attacks and destruction done by the wild animals. The most prominent animals attacking are monkeys, boars, and bears.

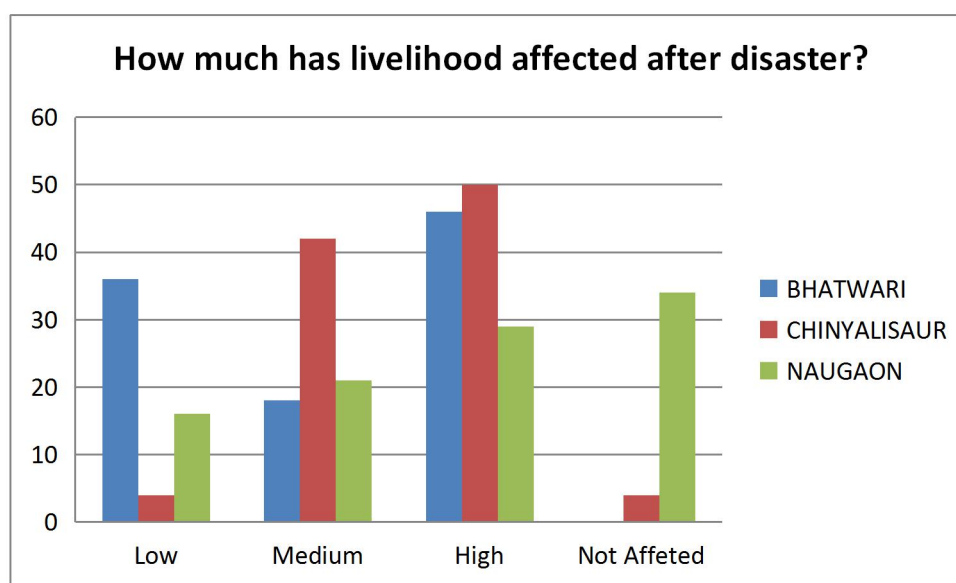
Figure 4.33 Whether in the sampled villages of the blocks there is possibility of utilizing existing village amenities



Interestingly from survey it was observed that in Bhatwari 100% villages were of the opinion that existing village amenities could be used for alternative

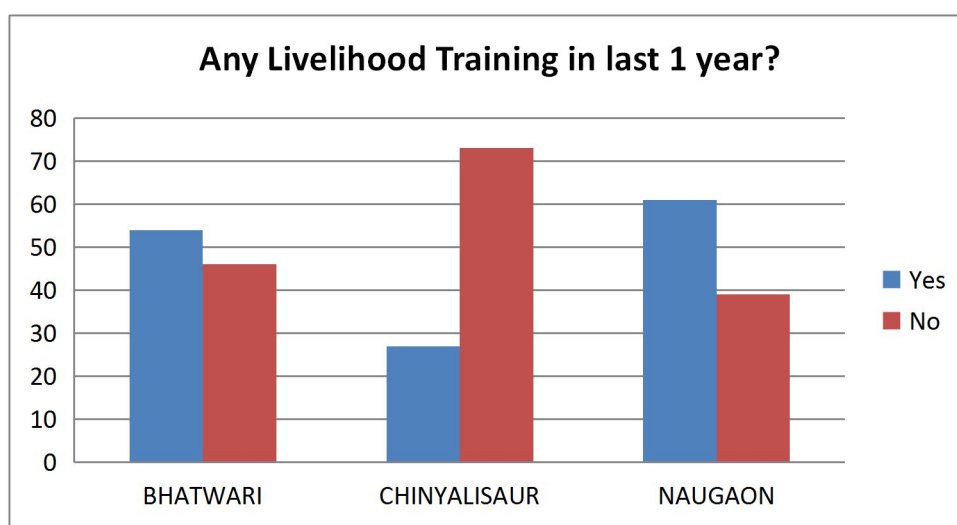
livelihood option. In Chiniyalisaur and Naugaon block also the proportion of affirmative response was quite high.

Figure 4.34 How much has livelihood affected after disaster



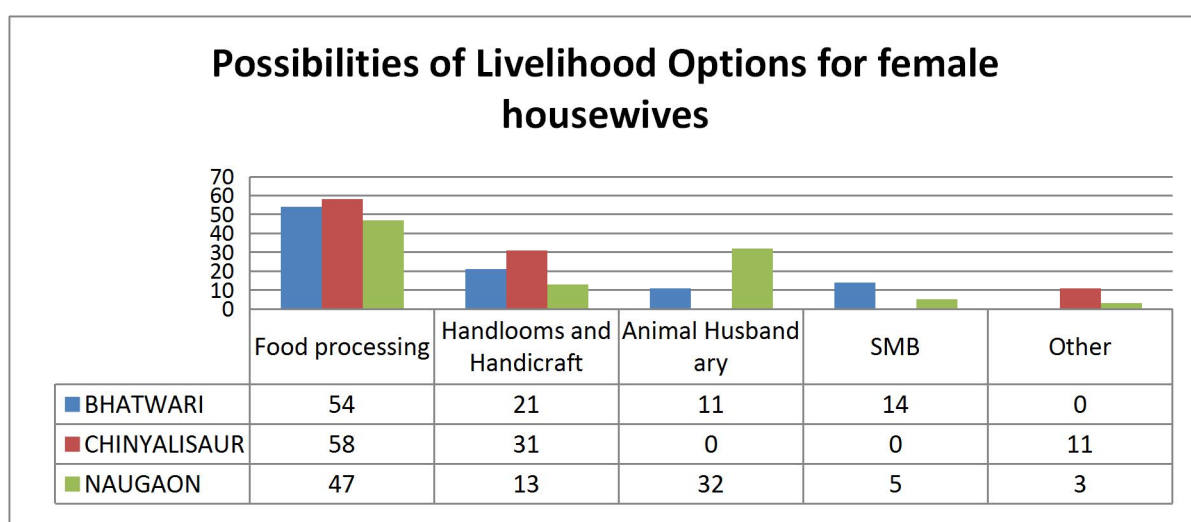
The aftermath of the multi-day disaster caused havoc in the whole district. The graph shows the scale of destruction caused to the blocks if any. As the results show that Chiniyalisaur is most affected block, where 50% are highly affected and 42% are affected in a medium range, and then followed by Bhatwari where 46% of the villages are highly affected. Many villages of Naugaon were not directly affected from the 2013 disaster (34%), but since the mountain regions of the state are interlinked with one another, even though the block was not directly affected but there were many indirect losses borne by the block.

Figure 4.35: Whether there has been any livelihood training in the last 1 year



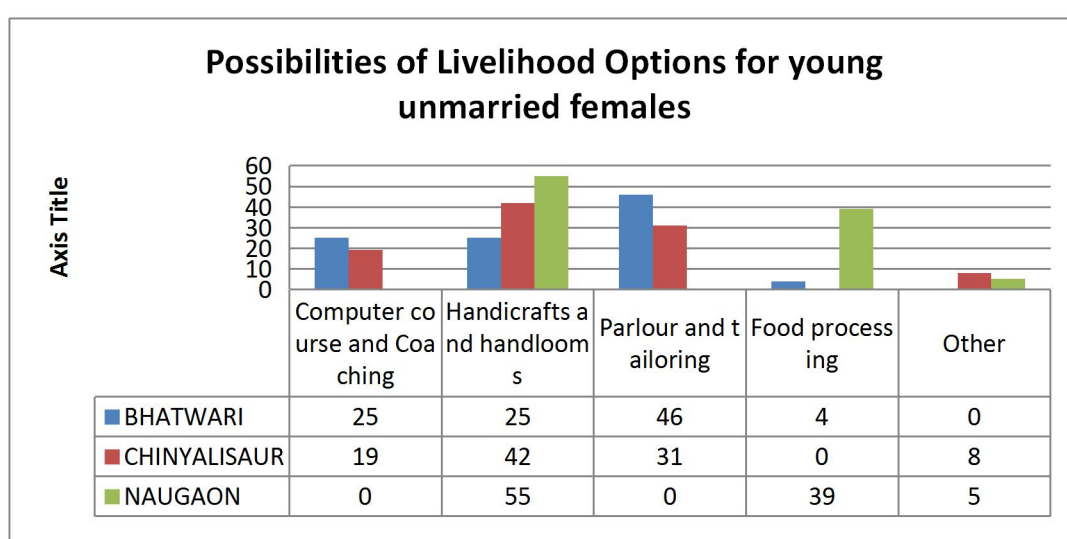
Livelihood is the first most priority because the disaster directly affected the primary sector and the tourism, which are the two main sources of livelihood in the hilly part of the state as a whole. Therefore initiatives for training related to livelihood and their alternatives are immensely important. Many NGOs have been working in the genre, and 54% of the villages in Bhatwari, 27% in Chinyalisaur and 61% in Naugaon received training for livelihood options in the past one year. Results show that on an average 50% of the villages of the sample received training and the other half did not, which constitutes most villages from Chinyalisaur i.e. 73%.

Figure 4.36: Possibilities of Livelihood Options for female housewives



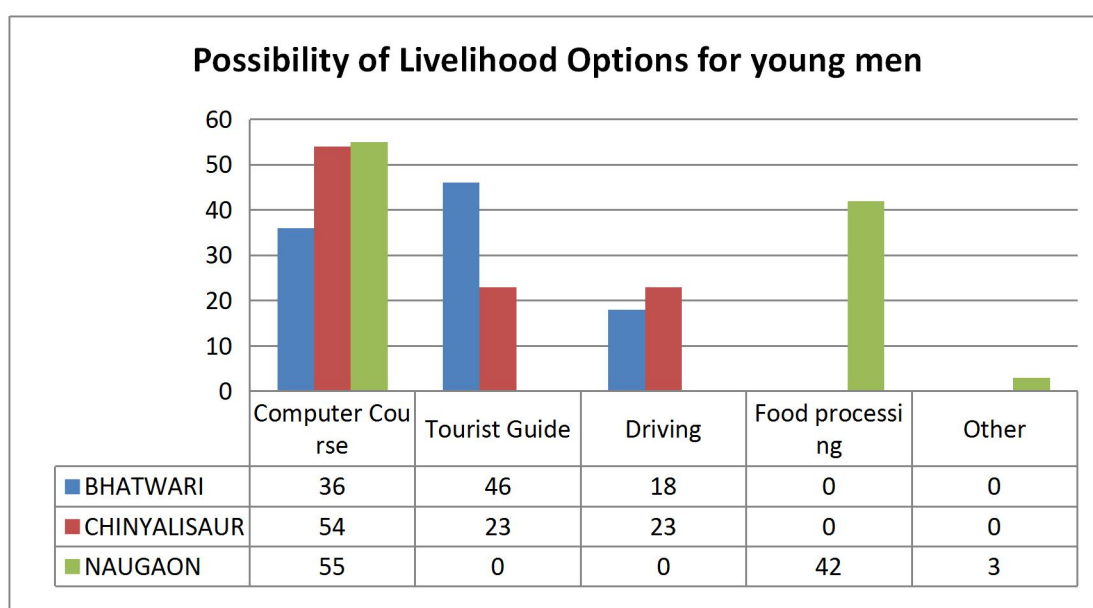
It is an age old reality in India that women especially in the rural areas are not given economic dominance in their families. *Women in rural areas* are concentrated in being *housewife* and agriculture sector. However there is a huge possibility for the women to turn the tables around to a great extent. There are possibilities for the housewives of all the three blocks to be majorly employed in the food processing units or in the handicraft and handloom industry. In Naugaon for 32% of the housewives, animal husbandry is a possible livelihood option as per respondents. In Chinyalisaur and Naugaon for women other possible livelihood options are garment knitting, tailoring and candle making.

Figure 4.37: Possibilities of Livelihood options for young unmarried female



In Naugaon as Figure 4.37 represents, possible employment opportunity is either to be employed in a food processing unit (39%) or work in handicrafts and handlooms (55%). For unmarried females in Bhatwari and Chinyalisaur the possible livelihood options are handicraft and handloom industry or be employed as tailors or in a beauty parlour.

Figure 4.38 : Possibility of livelihood option for young men



Young men in Bhatwari are either willing to work in a computer coaching institute (36%) or work in tourism related employment opportunities like being a tourist guide (46) or a private driver (18%). Similar is the case of Chinyalisaur block, where possible livelihood option for 54% young men is computer coaching centre and 46% in tourism related jobs. Naugaon showed a different trend, the possible and most effective livelihood option for young men is to work in a food processing unit.

GIS ANALYSIS

Remote sensing and GIS is very effective in the visualization and spatial analysis of any data as it could be linked with any amount of non-spatial data to be analyzed spatially and thus effectively used in various planning and decision making processes. In this study one of the technique known as suitability analysis has been applied in the analysis and finding a suitability site for alternative sources for generating livelihood opportunities have been explored.

Study Area: District of Uttarkashi of hilly state of Uttarakhand

Requirements:

GIS softwares: Open source software's such as QGIS, Google Earth and other sources available from internet

Other softwares: MS office

Methodology:

Different amenities/utilities have been identified and their GCP points have been collected from ground and verified taking the help of Google Earth and other possible sources from the internet. For school coordinates, some data were obtained from DMMC Uttarkashi. In sampled villages those coordinates were re checked from ground truthing

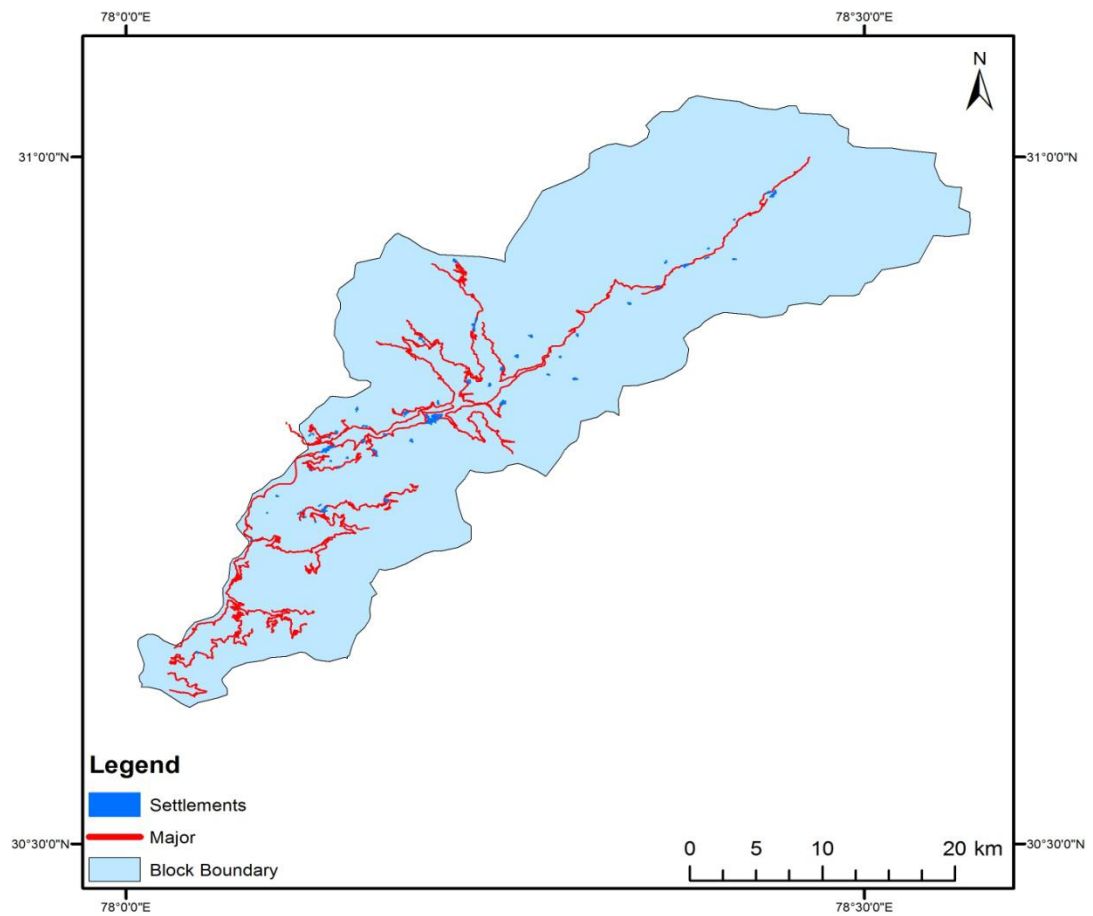
Spatial analysis for the different amenities/ utilities have been undertaken using different GIS and Remote Sensing techniques and tools for the identification of suitable site for exploring alternative livelihood options in the three sampled blocks of Uttarkashi district namely Bhatwari, Chiniyalisaur and Naogoan.

In each block some sampled village Panchayats were considered for collecting GCPs of the amenities/utilities.

These GCP points were then used in GIS environment for suitability analysis. In the whole process different GIS techniques and tools are used.

Map 4.1: Settlement map of Naogoan Block

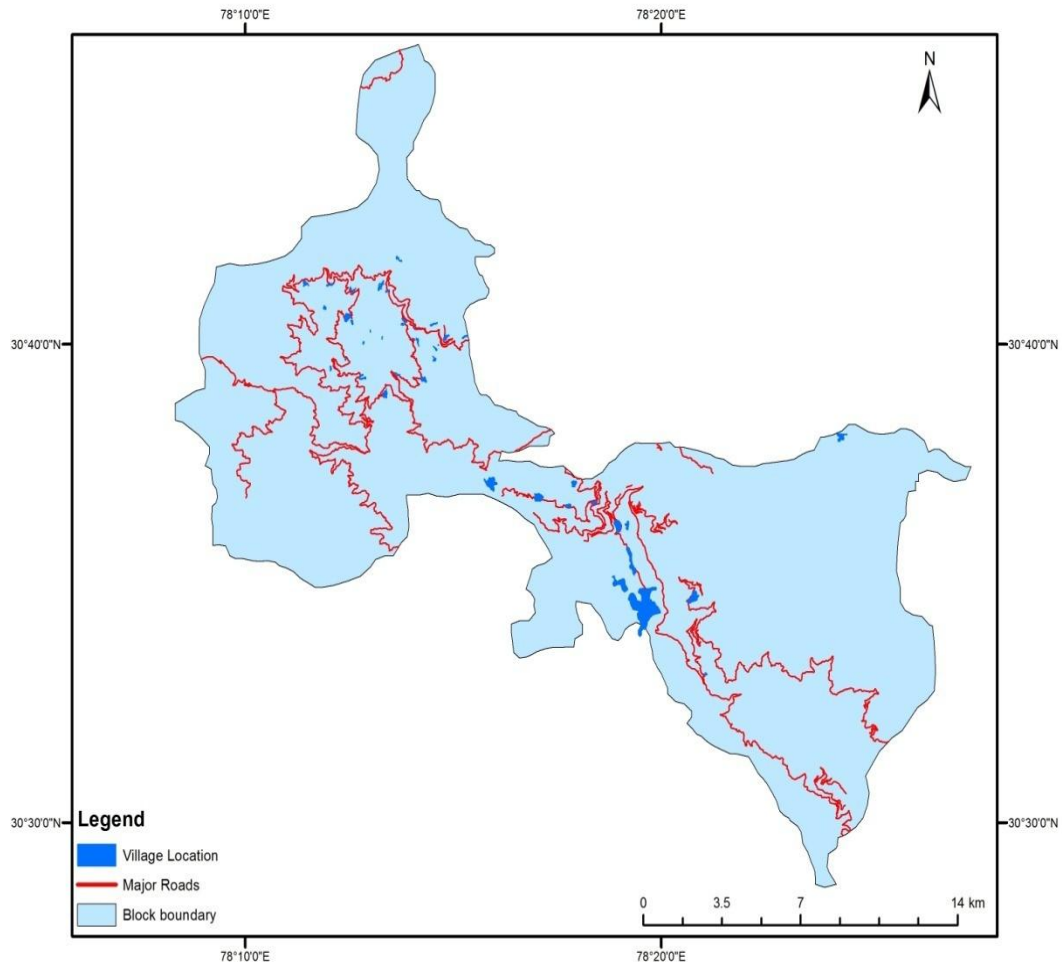
Settlement Map of Naugoan Block of Uttarkashi District



It is evident from the above map that in Naugoan block the settlements are dispersed but spread over a large area of the block

Map 4.2: Settlement Map of Chiniyalisaur block

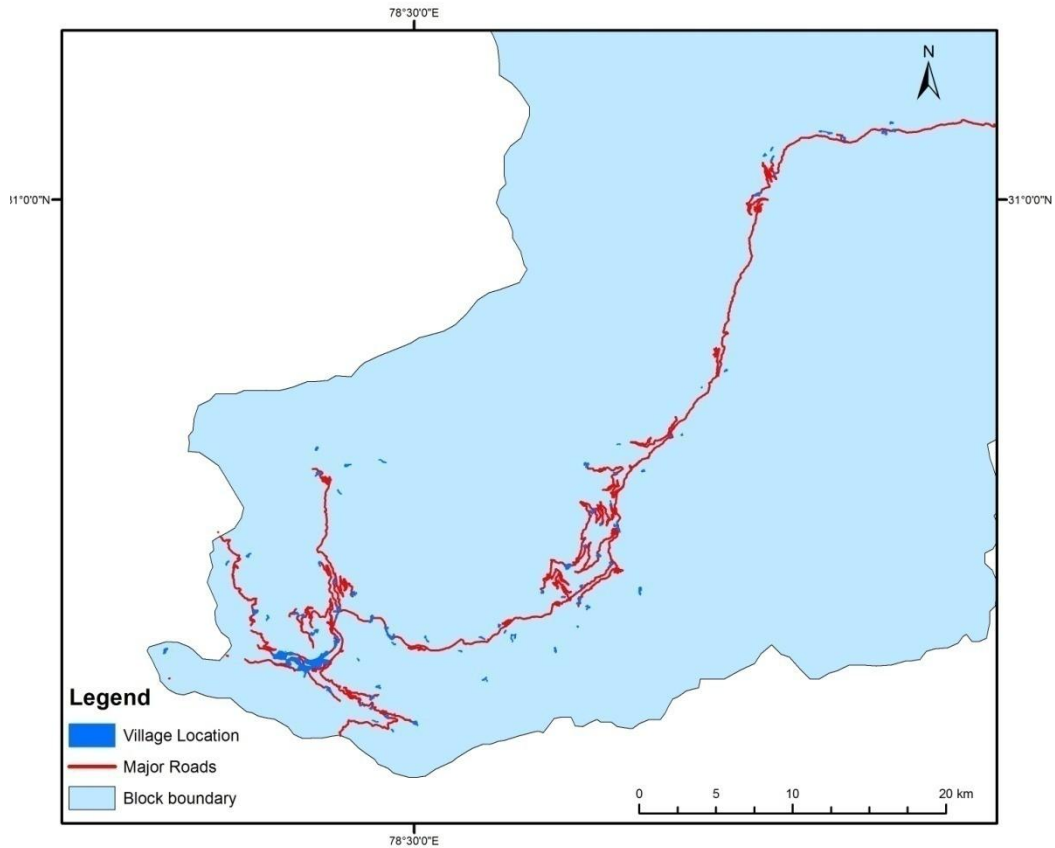
Settlement Map of Chinyalisour Block of Uttarkashi District



The settlement map of Chinyalisaur block also shows dispersed clusters of habitation and it is observed that such settlements have grown along either the Bhagirathi river or the National Highways.

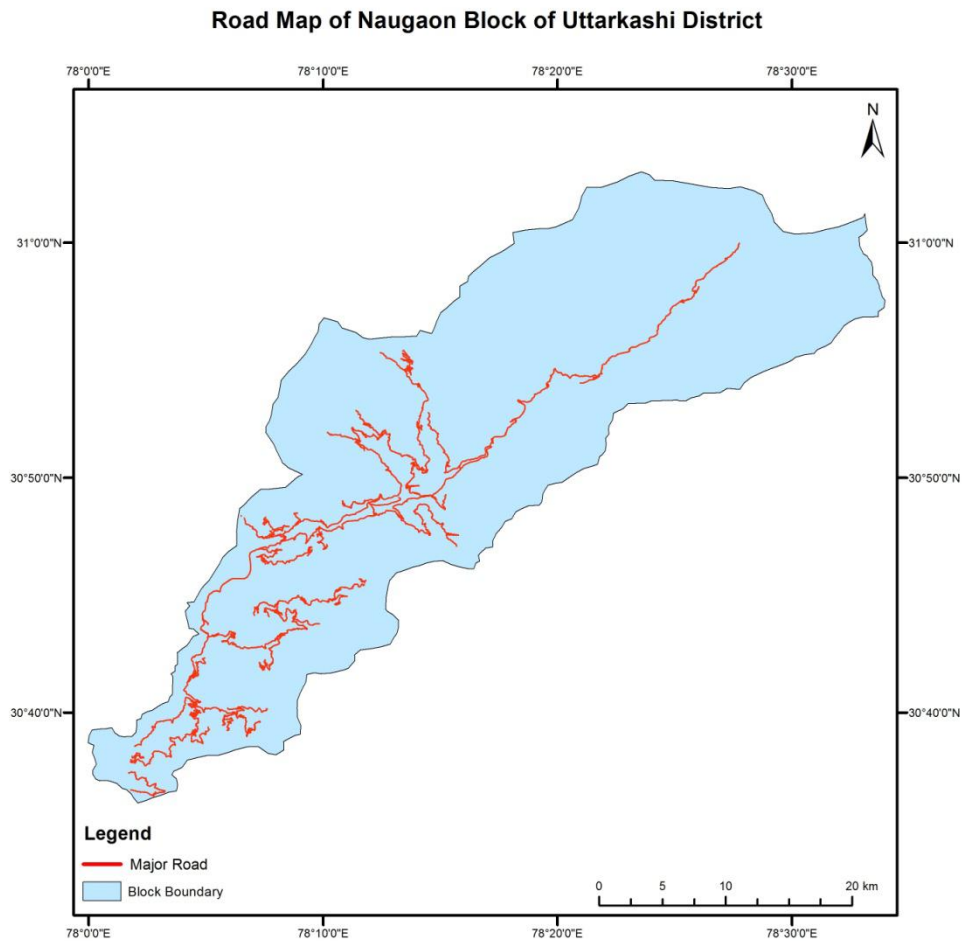
Map 4.3: Settlement Map of Bhatwari Block

Settlement Map of Bhatwari Block of Uttarkashi District



The settlement map of Bhatwari block shows concentration of habitation in some clusters. And the speciality of this block is that here settlements have not only grown along the Gangotri route but also away from the route. However in higher altitude towards Gangotri the concentration decreases.

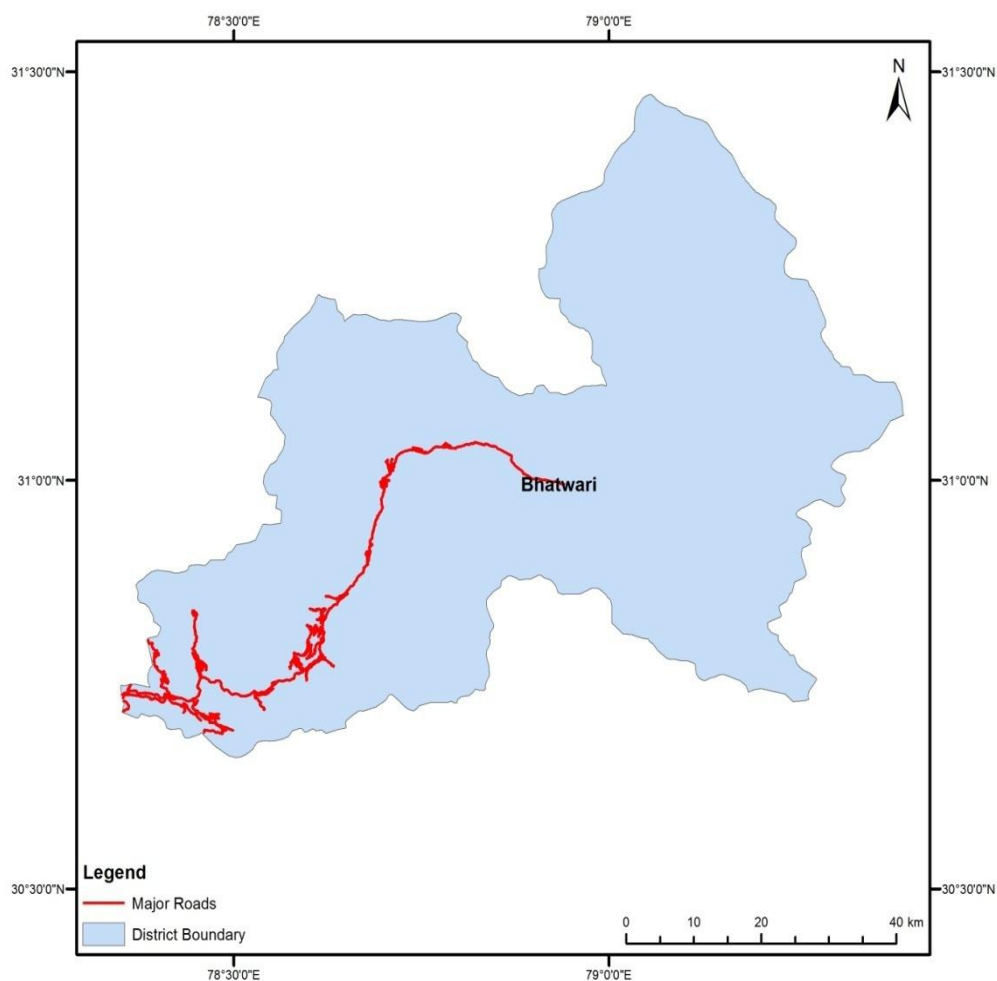
Map 4.4: Road Map of Naugoan Block



Road map has been created using Google Earth Imageries and Ground truthing. It is observed that this block has been developed in National highway with some cross cutting national and regional roads

Map 4.5: Road Map of Bhatwari Block

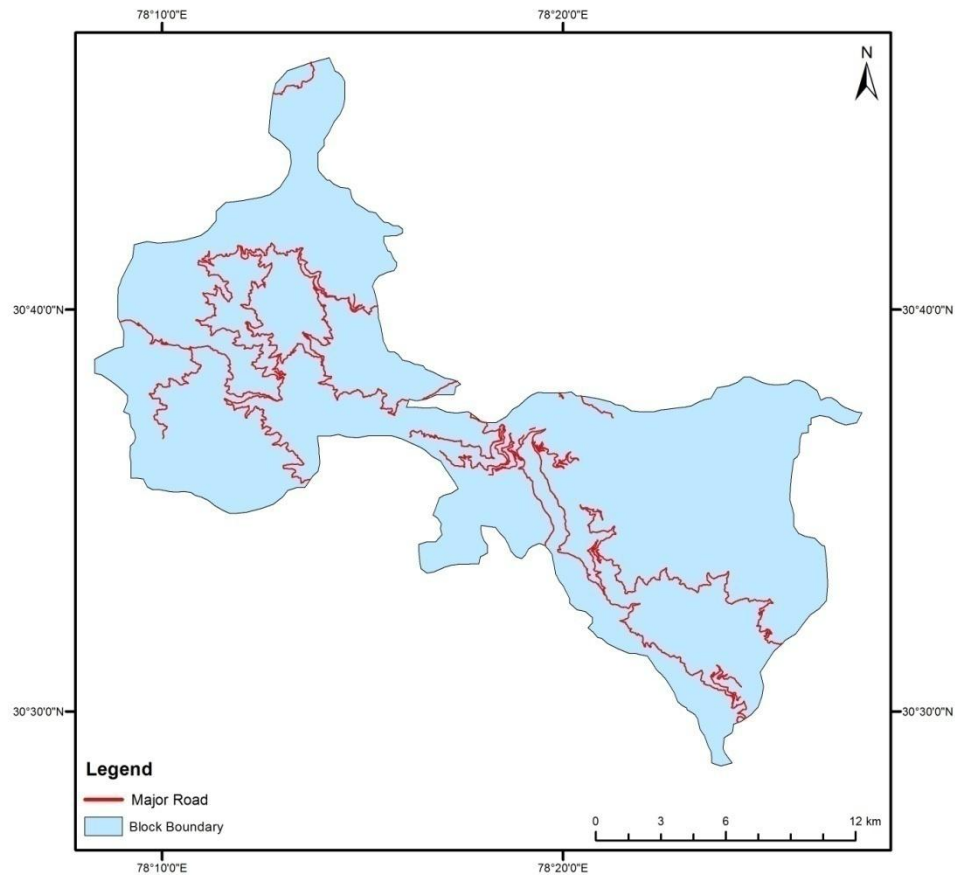
Road Map of Bhatwari Block of Uttarkashi District



The Road map has been shown from Uttarkashi till Bhatwari but on field visits, it was observed that motorable roads have reached in majority of the villages in the block

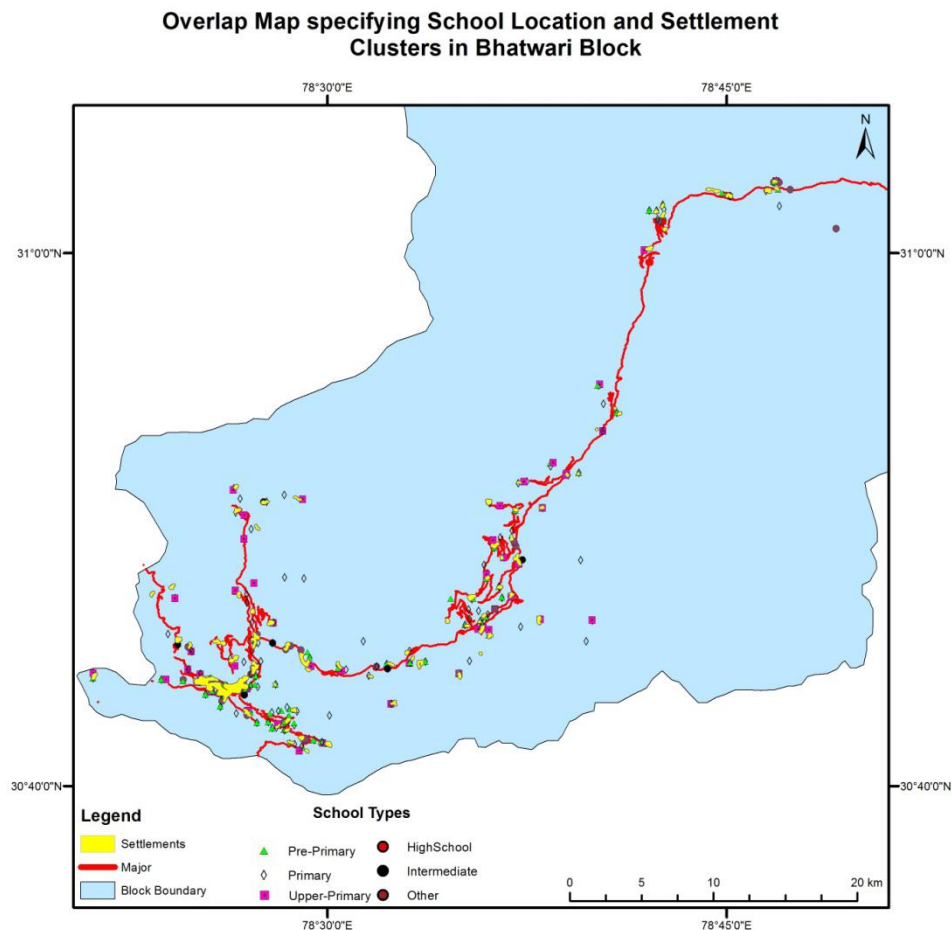
Map 4.6: Road Map of Chiniyalisaur Block

Road Map of Chinyalisour Block of Uttarkashi District



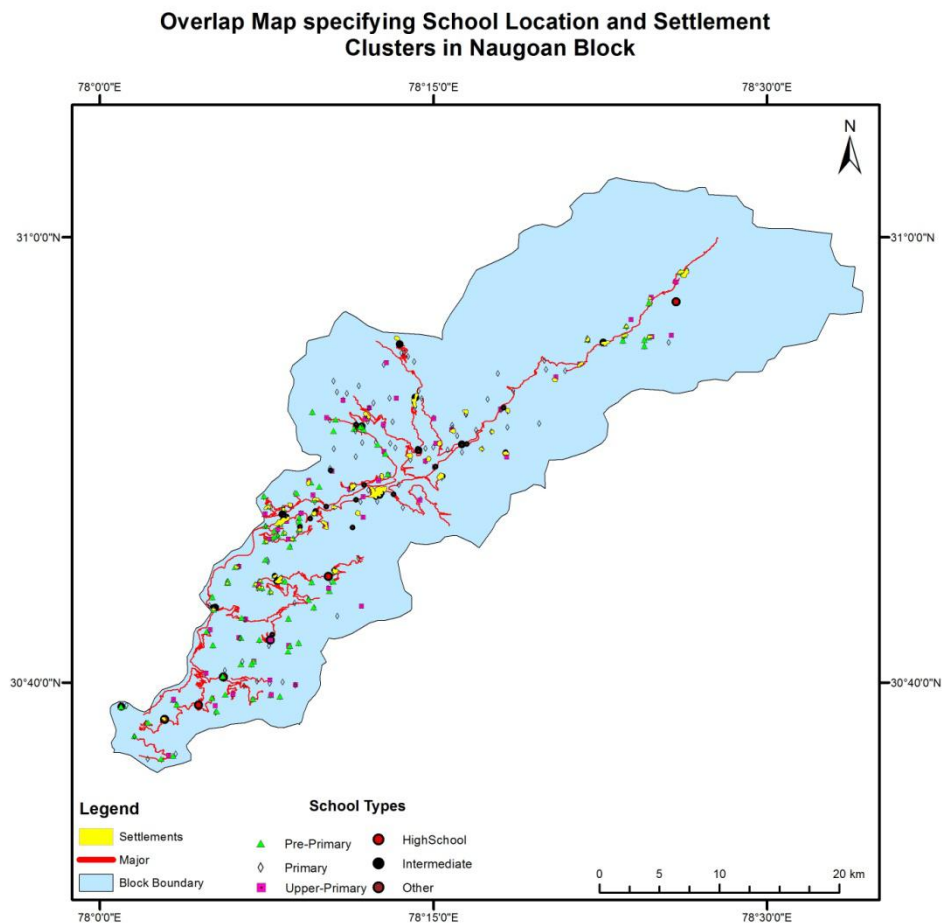
In Chinyalisaur the roadmap shows loop kind of structure very common in hilly terrains.

Map 4.7: Overlap Map of Bhatwari Block specifying School Location and settlement



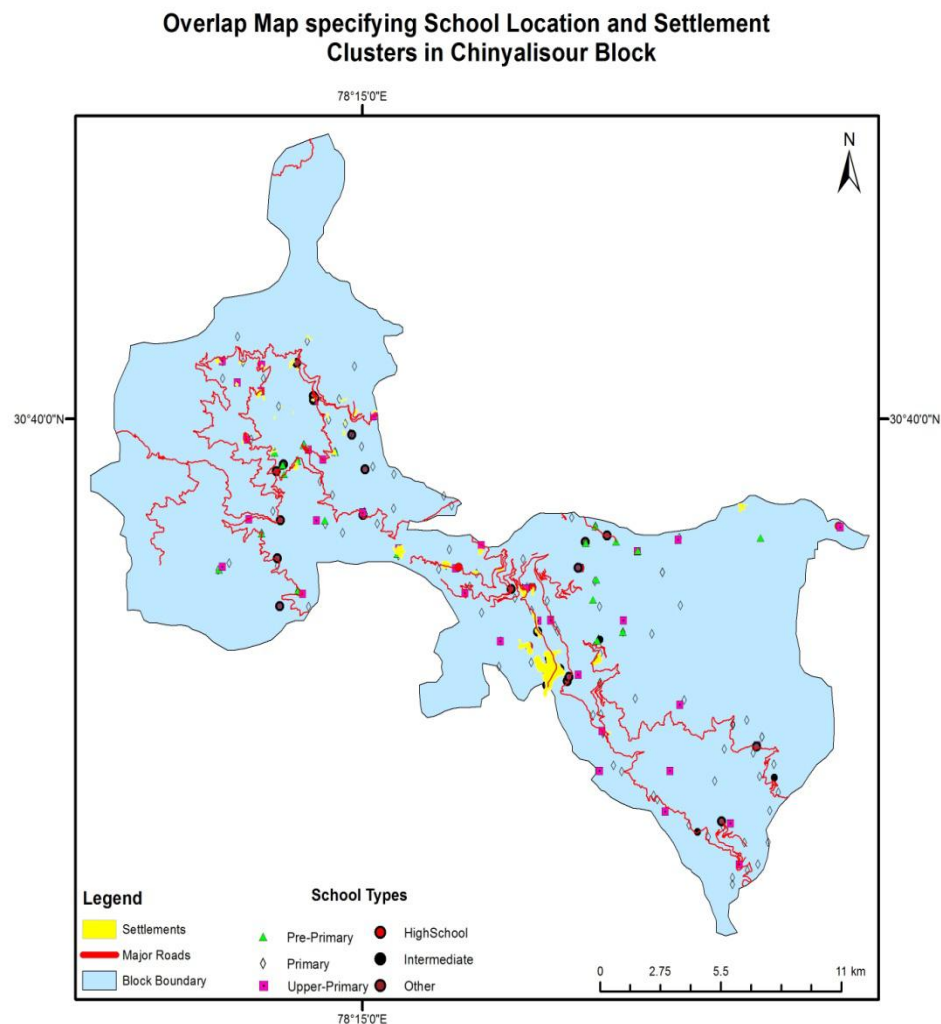
It is observed from the map that most schools are located in the periphery of the Gangotri Route. Even in village locations in off route settlements, schools are located and are very evident from categories of schools.

Map 4.8: Overlap Map of Naugaoan Block specifying School Location and settlement



In Naugaoan Block the school location and settlements show that RTE norms have been well implemented in the region as far as distance from habitation is concerned. It is seen that the concentration of schools are comparatively intense in this block.

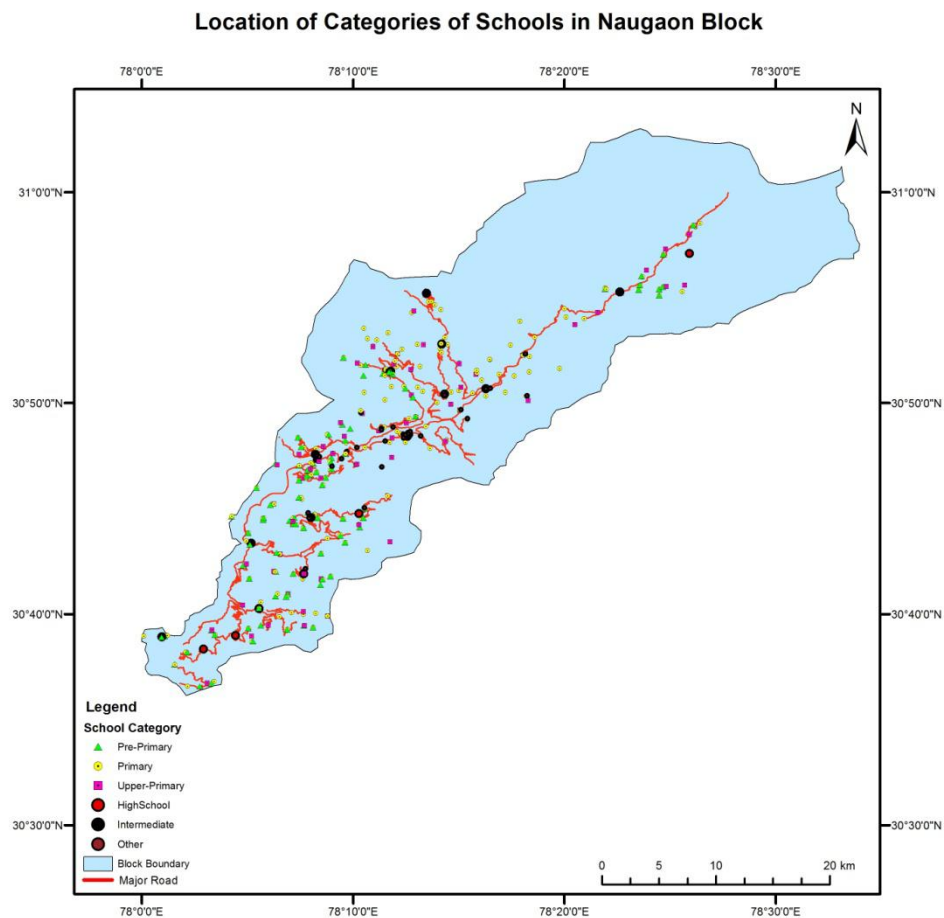
Map 4.9: Overlap Map of Chiniyalisaur Block specifying School Location and settlement



Chiniyalisaur shows some areas with less settlement but availability of schools. However during field visit it was observed that at least a primary

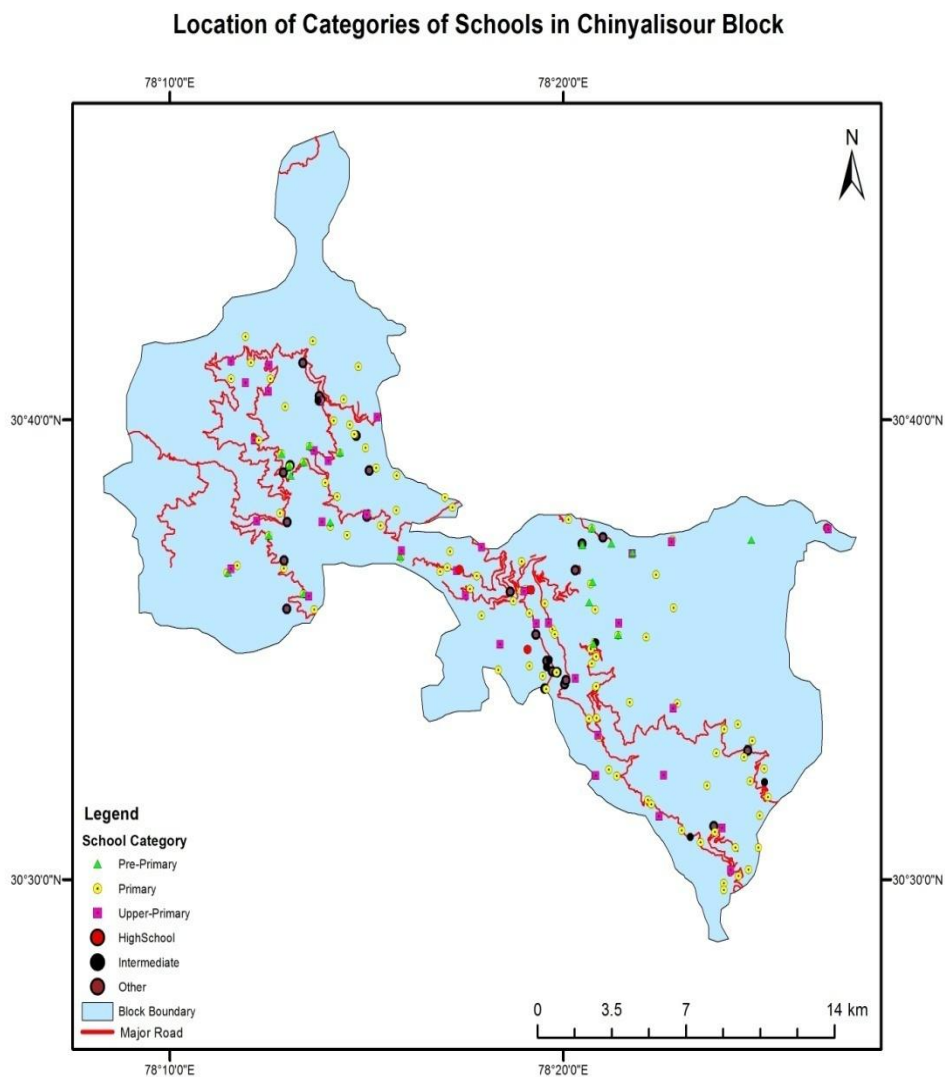
school was available even if the village had habitation of less than 10 households.

Map 4.10: Location of categories of schools in Naugaon Block



Location of different categories of school are shown in map 4.10 and it is clear that Pre Primary/ Anganwadi and GPS are very large in numbers and very well distributed all over the block. There is sparse density of Intermediate education and above level.

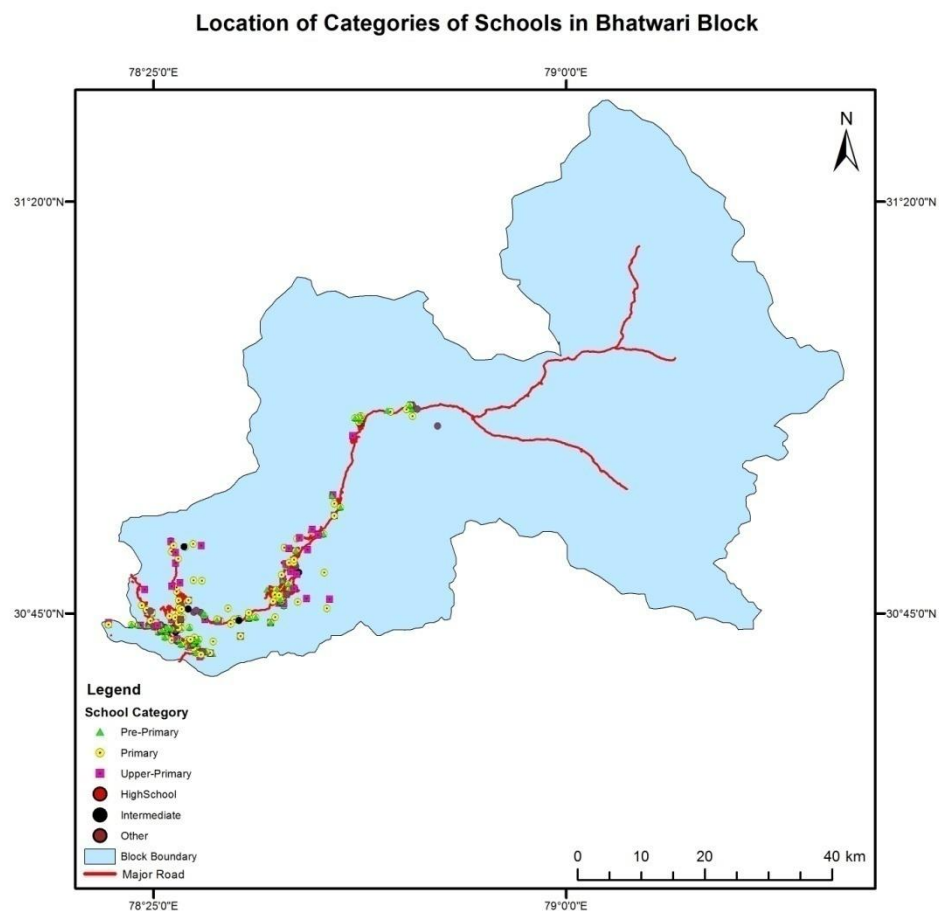
Map 4.11: Location of categories of schools in Chiniyalisaur Block



Location of different categories of school are shown in map 4.11 and it is clear that Pre Primary/ Anganwadi and GPS are in good numbers followed by

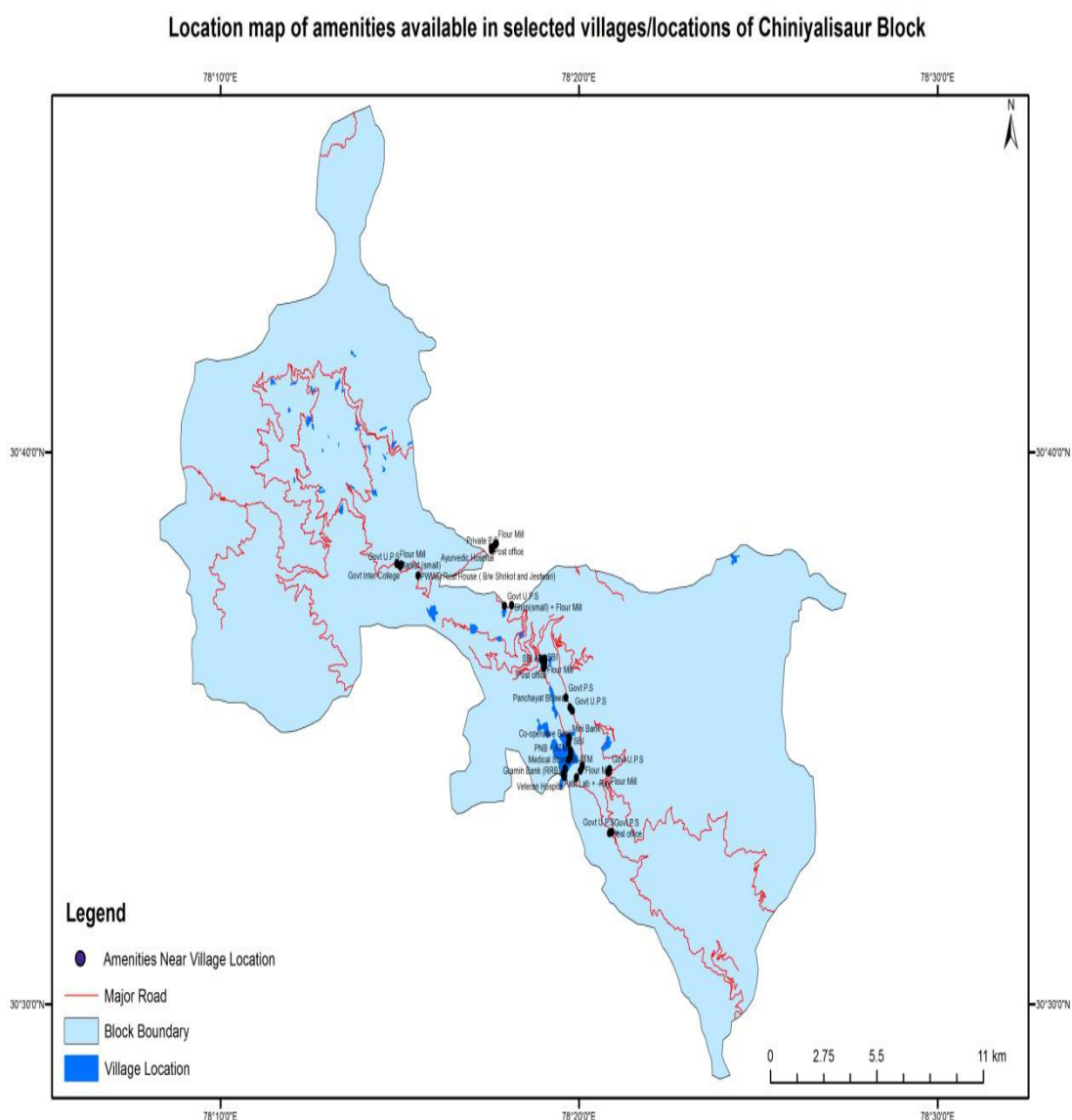
secondary schools. There is sparse density of Intermediate education and above level in the block

Map 4.12: Location of categories of schools in Bhatwari Block



In Bhatwari it is clear that the concentration of schools have been in the Uttarkashi area and then only a few kilometres along and off the Gangotri route.

Map 4.13 Location map of amenities in selected villages of Chiniyalisaur

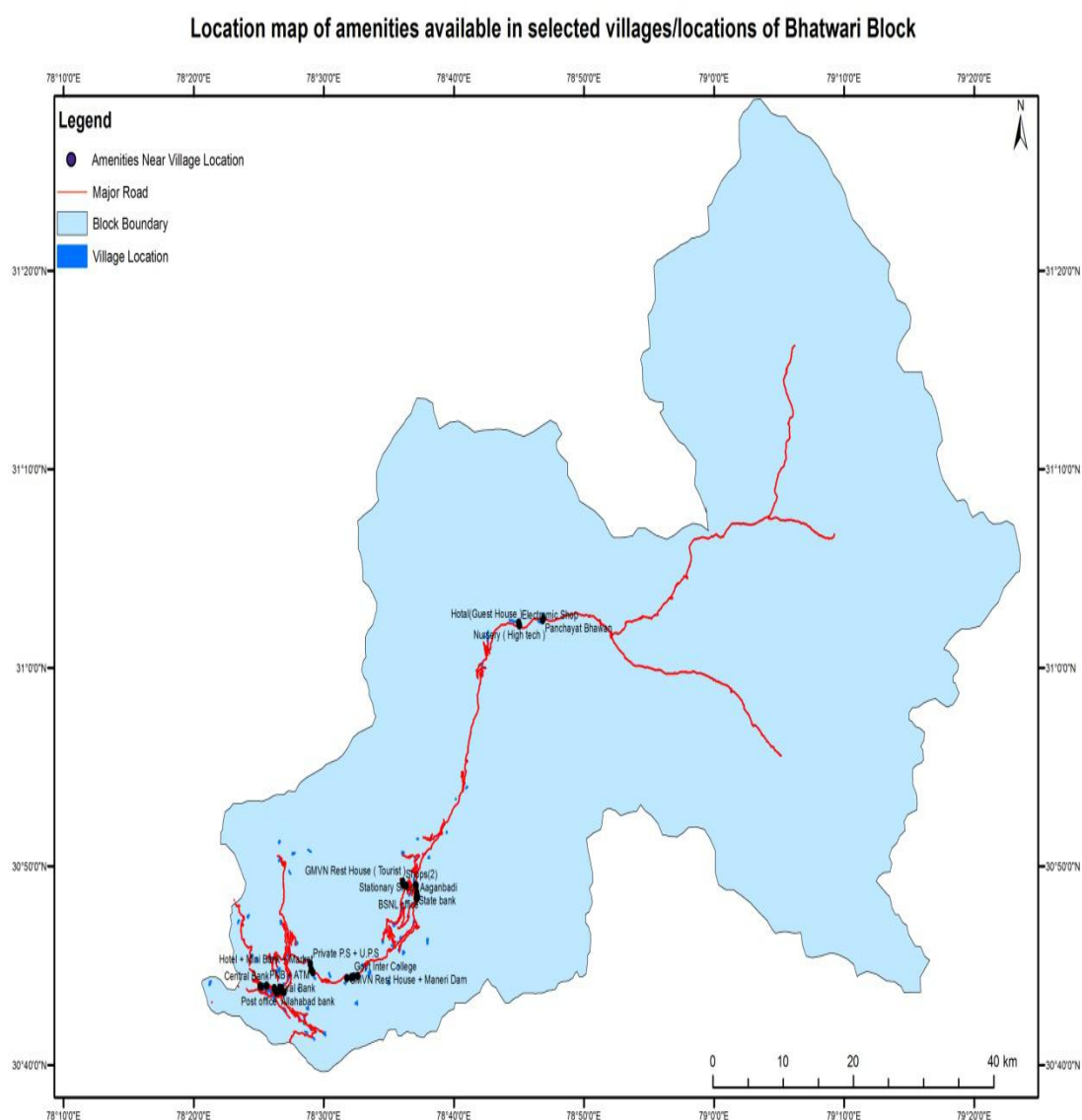


Map 4.14 Location map of amenities in selected villages of Naogoan

[illegible]

In Naugoan also the amenities of the select villages show that they are in the periphery of the National Highway.

Map 4.15 Location map of amenities in selected villages of Bhatwari Block



In Bhatwari the amenities in select villages show concentration near the district headquarter as evident from Map 4.15.

ANALYSIS FROM DISCUSSION WITH NGOs, GOVERNMENT DEPARTMENTS WORKING ON LIVELIHOOD IN THE AREA

ILSP- Integrated Livelihood Support Project

Uttarakhand Gram Vikas Samiti, is a society promoted by the department of Rural Development, Government of Uttarakhand to undertake livelihood-related projects. This society has currently implemented Integrated Livelihood

Support Project in the state. The main objective of the project is to provide sustainable livelihood opportunities and make the villagers independent by interlinking them with the market and integrating the national as well as international economies. The project has adopted a two way approach for the enhancement of livelihood in the hill districts:

1. The first is to support and develop the food production systems
2. The second is to develop and encourage non-farm livelihoods with the support of community involvement in rural tourism, and vocational training.

The main components of the project as evident from experience survey include:

1. Food Security and Livelihood Enhancement-

Cereal cultivation in the hills is becoming uncompetitive due to shortage of labour, high production costs and wild animal damage . ILSP is involved in extending support in crop and livestock production for food security and develop high value cash crops and other products. ILSP aims to provide cash incomes through various institutions. ILSP has engaged seven Technical Agencies (TAs) for field implementation. The project provides funding to each Producer Group for implementing Food Security Improvement Plan (FSIP) calculated at INR 3600 per member per year for two years. For this funding to purchase improved seed and other agricultural inputs, ILSP has started various income generating activities such marketing animal feed and other dairy inputs, spices, grocery shops and milk collection. The project has a clear vision to improve access to employment in the non-farm sector by supporting vocational training linked to job placement. Technical services are provided and physical infrastructures will be developed for providing market access support to producers.

ILSP caters to the off season vegetables including potatoes and spices and is the other main sub-sector now being developed. Currently producers are constrained by being partially aware of the market conditions in major markets and the most advantageous cropping and harvesting calendar to take advantage of high off-season prices, unable to increase production due to shortage of labour and wild animal

damage and being ill-equipped to handle markets both within and outside the state to achieve better sale price

2. Participatory Watershed Development-

Implemented by the Watershed Management Directorate (WMD) it uses processes that have been established through a series of watershed development projects in the state, but with focus on food security, livelihoods and market linkages. It will protect and improve the productive potential of the natural resources in selected watersheds, alongside the promotion of sustainable agriculture with formation of Livelihood Communities, and with improved access to markets.

3. Livelihood financing-

- a) Banking support – which covers capacity building, support to banks and local financial institutions to opening new branches in the project area.
- b) Loan at reasonable rates/ Venture financing with banks to the business enterprises emerging under the project area as per the business plan of the ventures.
- c) Risk management – piloting and scaling up of insurance services such as weather, cattle, health insurance.
- c) Financial inclusion initiatives – training to LC to be bank agents as Business Correspondent/ Business facilitator, product literacy training etc.
- d) Provision of development finance to ULIPH federations as viability gap funding to promote the agribusiness activities.

AJEEVIKA - is one of the programs that comes under ILSP. The head office of Aajeevika in Uttarkashi is in Joshiyara and led by Mr. Kamlesh Bhatt. The field investigators on discussion with Mr. Bhatt found that the main objective of Aajeevika is to enhance livelihood options for the vulnerable groups, in a sustainable manner through promotion of livelihood and strengthening of local groups related to livelihood development. Aajeevika is also engaged in providing rural finance and soft loans.

The program is subdivided into three wings:

- UGVs: Uttarakashi Gram Vikas Samiti
- WMD: Watershed Management Development
- UPASC: Uttarkashi Pravartiya Aajeevika Sambhardhan Company

Himalayan Prayavaran Jadi-buti Agro, Sansthan, JADDI Uttarkashi

JADDI is an organization formed in 2001 by a group of people situated in the Uttarkashi district. The main aim of the organization is to inculcate attitude and values of conservation amongst community, promotion of livelihood opportunities, improving the socio-economic condition of the local communities along with the environment, and most importantly to promote disaster risk reduction and climate change adaptation measures. JADDI has many programs going on, out of which farmer's market "Garh Bazaar" is their latest achievement. JADDI introduced "Garh Bazaar" in Uttarkashi with the aim of providing direct market and better linkage for economic uplifting and sustainability of rural farm products and dislodging middleman in farming sector. JADDI has been actively involved in the disaster management activities like awareness at various levels. In the Uttarakhand disaster 2013, this organisation actively participated at preparedness level as well as relief and rehabilitation post-disaster. Besides these JADDI is also active in advocating important issues, like *Nadi Bachao Abhiyaan*, *Nasha Mukti Abhiyaan*, *Uttarkashi Polythene Mukti Abhiyan* and Renewable Energy.

Radha Pawarji works with JADDI and is associated with livelihood programs. She told during the interview that stone crafting has a huge opportunity for livelihood provided it is linked to tourism. Moreover diversification of products using *mundwa*, *jhingora* etc has huge possibility in the region if produced at commercial level with branding and efficient market linkages.

SBMA

Sri Bhuvaneswari Mahila Ashram, an NGO is working in the area for a long time with persistent observable outcomes. The mission is to work with children and communities, it organizations/institutions, government, technical and academic institutions and other civil society groups to create a society where every child is happy – their well being assured. SBMA supports and encourages families and communities to achieve this seemingly

straightforward goal of happy children. In societies where progress is slow or is skewed they intend to work towards empowering communities to adopt a holistic and wholesome approach to the processes of progress and development. The regional officer of SBMA, Thapliyalji gave a long interview and it was evident that there are huge opportunities to explore the available resources of the region and link those for alternative livelihood options.

Thapliyalji pointed out that the young generation of the state has to come forward and be the torch bearers to explore livelihood options in their own villages.

Opportunity for Trout Farming-

The project report would help the government in finding business opportunities for local people as well as to explore export avenues, as the demand for the trout is growing world-wide.

As the first step, the government is producing fingerlings of the trout at its three fish farms in the Uttarkashi and Chamoli districts. Two lakh fingerlings were currently being produced in these three farms, an official said.

With the market rate of trouts hovering around Rs 500 per kg, the government has also asked the revenue and forest departments to stop the illegal fishing of the trout, which is generally found at a height above 4,000 feet and at temperatures 5-10 degree Celcius.

From these farms, the fingerlings are then transferred to various rivers like the Tons, the Assiganga, the Balquila and the Pinder, which are generally snow-fed. Three varieties of trouts are found in Uttaranchal--Brown Trout, Rainbow Trout and Snow Trout. Rainbow trout has high demand in Britain, France and other European nations.

"We are encouraging all the three varieties in the state," the official said. The government is also setting up a packaging plant in Pantnagar to package the fish.

CONCLUSIONS AND RECOMMENDATIONS

Uttarakhand was a result of a long lasting mass movement, a large number of life sacrifices. The dream was to project the toughness of life in the hills and to enjoy equal benefit of democracy. The objective was to put and project the rural villages which have faced and lived in the difficult topology enduring the real toughness into the limelight so that more importance should be given to make life better. There has been a strong change in the structure of the whole economy. Since the beginning of life human beings have developed knowledge and found ways to derive livelihood options and opportunities from the plenteousness of nature's diversity. Himalayas are rich in biological, climatic, topographic and cultural diversity and the communities have derived many essential goods and services from the natural ecosystem and the economy clearly depends upon the Himalayan ecosystem. Adaptation by the community to natural disasters can be through technical strategies or non-technical strategies. Since Uttarkashi has been experiencing natural disaster for many decades, the natives have eventually to some extent been able to adapt to the recurring natural disasters in traditional ways in technical strategies that include combining materials for house construction, raising height of the floor, making the house thatch before the rains and non-technical strategies which might include ensuring food security, livelihood security, community networks etc.

FIRST LEVEL

In the first strata of the study we did a pre and post disaster comparison thereby analyzing the variations in the availability of basic amenities. The overall analysis of the study reveals that the worst hit sector was the primary sector. A very contradictory picture has been noticed in the graphs showing loss of production. From the graph it is seen that in Uttarkashi district there is

maximum amount loss of production in irrigated land. From literature it is seen that this district has some main rivers flowing and farmers have ploughed their lands on river banks. During the disaster these rivers changed their courses taking away the lands and crops along.

SECOND LEVEL

The main source of livelihood in Uttarakhand even after one and half decade of establishment, till date is agriculture. However the farmers in the hilly regions are facing some challenges like problem of marketing linkages, storage system, transportation, Human-wildlife conflict, growth of weeds (e.g parthenium), climate change and the recurring nature of disasters. Amidst these challenges, the farmers of some regions somehow are unable to cope with the larger market demand and technology friendly production. Due to these reasons farming as the sole means of livelihood is losing its significance in the region. Moreover this complemented with frequent natural disasters have added to the agony in the livelihood option.

The people of Uttarkashi have been and still are living in a fragile landscape and their marginalization and threat to livelihood demands them to adopt new opportunities with the given resources and utilization of comparative advantages. There are a number of unexplored possible innovative livelihood outcomes and income generation strategies that can be efficiently channelized to improve the socio-economic and the environmental changes. Keeping the incidence of disasters and the world concerning climate change in the particular district, farming alone cannot meet the needs of the population and non-farm livelihood options should be promoted because non-farm livelihood options are a catalyst towards a sustainable future. Uttarkashi enjoys a huge comparative advantage for niche resources in terms of both manpower and resources.

Migration is a risk minimizing strategy that provides families with a buffer against the impacts of natural disasters. The study area is famous for its picturesque landscape and pleasant climate but due to rapid unplanned development and expansion in the past decade the landscape of the study area has changed drastically.

One thing that was common was that the entire sample village panchayats had animal husbandry as an existing alternative livelihood option. Animal husbandry is a major livelihood option for rural Uttarakhand as it is associated and interlinked with a number of other sustainable options like the cattle can be used for dairy farming, butchers, extracting wool for women knitting, and many others. It can be concluded that animal husbandry is a multi-faceted and very efficient alternative livelihood option that is present in the three blocks of Uttarkashi. In Bhatwari, other alternative means of support are handloom, poultry and bee keeping. Apiculture is a trending livelihood option in the block; however it is being mainly done for subsistence needs or for selling honey locally. Naugaon has had some peculiar changes in the recent years, that is of using the over production of apples for food processing and thereby generating employment opportunities of the village people and the neighboring places as well. 39% of the villages in the Naugaon block have adopted food processing as an alternative livelihood option but as far as the growth of this particular sector is concerned, it will benefit not only at micro level but also the state of Uttarakhand as a whole. In comparison to the other two blocks, Chinyalisaur has no alternative livelihood as such; the villages on a large scale, agriculture and allied activities are still the primary and mainstay livelihoods and occupations.

NGOS/CBOs/SHGs

There are a number of self-help groups working for the cause of welfare of the villagers. To provide relief to thousands of people affected by the disaster in Uttarakhand, several city-based NGOs and individuals have come forward to help the villages overcome the effects of the disasters and its repercussions. Extensive damage was caused to the cultivable land, horticulture crops and irrigation infrastructure and water supply systems. Public infrastructure such as roads and vital bridges, administrative buildings, schools and health centres, were badly damaged, and thereby basic amenities and services of education, healthcare, communication, power, etc., also severely affected. All this caused a prolonged adverse effect on the livelihood of the people. NGOs and government agencies and schemes like Ajjevika, Reliance, Wipro, JAADI, Bhuvneshwari Mahila Ashram have worked towards the generation of alternative livelihood opportunities and securing the present source of income for the people post disaster. In Naugaon, local people have created a community that works for livelihood and employment generating ways. HARC gives free seeds and training on agriculture in the village.

Migration

As per Census 2011, of 16,793 villages in Uttarakhand, 1,053 have no households as a result migration is one of the major concerns brewing in Uttarakhand. After the disaster of 2013, the rate of migration has risen manifold. The villages that are being left barren are immensely serene with beautiful old wooden houses with slate roofs, intricately carved door frames, baroque balcony, fully electrified, field where crops were sown are now bearing the weeds.

A lady who has been living in a hotel[on rent] with her two school going sons for the past three years after migrating from her village for education of children says, *"Agriculture is the main source of livelihood, and apparently*

over the time farming has completely stopped along with human animal conflict farmers are unable to produce the crops even for their own use. This is why people are helpless to migrate from the village to nearby town and some go far away town in search of livelihood."

One peculiar pattern was noticed that people are migrating to places that are mostly within a radius of 200 kms. It was found out that the people are coming from their villages and living in rent at places that are near the markets and places where there is easy accessibility to the basic amenities of life. There is a trend of intra-migration in the blocks and the main reasons are livelihood and approachability to the basic amenities especially education. 52 year old Devender Singh of Kayak says, *"we do not see any bright future of the children in the village, that is why I have sent my children to Dehradun to my relatives place for their schooling and I and my wife earn from the farmlands and MGNREGA scheme"*

On one hand two of the blocks are experiencing migration; on the other hand 76% of the villages in Naugaon have not witnessed migration at all. This brings light to a very significant conclusion that people in Naugaon instead of migrating to places in search of livelihood; has been utilizing their resources for the purpose of livelihood opportunities like use of apples for food processing, horticulture, mushrooms, and other efficient allocation of resources for employment generation. This has not only lessened the migration rate but has also attracted people from the other villages to the block.

The women pradhan of Harshil was a special case study. She is the pradhan for last two tenures and working a lot to stop migration, make Harshil 'polythene free' area. She told the investigators during the survey that "opportunities have to be developed in villages with own resources. There are

ample of varieties of medicinal plants in the area but this indigenous knowledge cannot be transferred as this generation is migrating from the village. For livelihood sufficient opportunities are there, only the government has to ensure the marketing linkages and smooth transportation. Making of perfumes and “agarbattis” can be one such option”

POSSIBILITY OF ALTERNATIVE LIVELIHOOD[POAL]

Disaster causes immense loss of life and property, and as envisaged earlier disasters in rural areas affect the primary sectors the most. In Bhatwari block, the flash flood washed out the agriculture land of many villages like Ladari, Didsari, Dilsaud, Maneri, Jamak, Aungi, Barsu, Kayark [all included in our sample] and also damaged the cowshed, water mills, irrigation canal, pipe line etc. Naugaon and Chinyalisaur blocks have also been victims and borne damages in some of the villages of agriculture land, cowshed and other public property of other villages. For a long spell even post disaster, due to lack of accessibility, in many locations, the supply of food, health, electricity, daily needs items and other essential services was blocked in the area. In the study areas there are evidences of transformation and diversification of economic activities and immense resources by which people can pursue a number of alternative activities. One of the major aims of the research was to realize the potential livelihood options in the blocks. It is presumed that it will give people the opportunity to diversify and become more resilient in times of need especially post disaster.

POAL 1- Handicraft- Uttarakhand is blessed with immensely skilled human capital that have created and nurtures various forms of art and craft since ages. With a unique touch of nature in their handicraft be it, aipan, ringal works, murals, paintings, wood carvings or extremely beautiful and professional temple architecture. The most prominent craft of Uttaranchal is

wood carving. Without any touch of electric machine on wood, without any use of modern technique, what these carpenters carve out on the wood is an exceptional art. But with the advent of globalization, supply chain inefficiencies and the availability of cheaper and more varied products, crafts are typically perceived as traditional, old-fashioned and antithetical to modern tastes, this art has been lost in oblivion and on the temple walls. The point to be noticed is that if the stone craft of Rajasthan is widely projected and showcased, then there is a potential and scope in the field of wooden architecture of the carpenters of Uttarakhand also. However, overtime in Bhatwari and Chinyalisaur, this art is being recognized and being promoted.

POAL 2- Food Processing Unit-The production of apple has been a blessing for the villagers of Uttarkashi. Since Uttarakhand is a pilgrimage center, linking apple orchards in the hill State to tourism can go a long way in boosting the apple sales as well as tourism, especially during the apple ripening time which is the same as *yatra* season. The upper belt of Uttarkashi is best suited for the production of apples of almost all types, like the Royal, Golden or Spur. The production of apples is rich in both quantity as well as quality and for most of the people, production and sale of apples is the main source of livelihood. During the field visit it was seen that apple is one of the fruits that needs good storage system because it is difficult to preserve and store. Most of the farmers are undergoing this problem of storage. In a particular village in Naugaon, there is a privately owned cold storage centre. Since there is no other source of storage, the private owners charge exorbitant prices from the farmers for storage or buy apples from them at lower rates but sell at the market rates. There is an urgent need for the government to set up a cold storage unit to protect the interest of the farmers so that they get their well-deserved returns.

There are a number of other opportunities associated with the production of apples which are not being acknowledged. If we compare the state of Uttarakhand and Himachal Pradesh, it is evident that the economy of Himachal has risen manifold. One of the reasons is that people of Himachal have been successful in optimally utilizing their resources and generation of alternative livelihood options, one remarkable example is that from the production of apples itself they have created innumerable opportunities of employment. Similarly, if apple processing units are set up, people who do not possess land and or orchards can be given employment opportunities. Apples should be processed into apple jams, chutney, juice, pickles, sweets etc. Role of the government in setting up of plants, interlinking markets and distribution process is very important. This process, besides providing alternative options of employment and raising the standards of living will be cost effective and economical because of the easily available raw materials.

POAL 3- Pastoralism – plays a substantial role in the livelihood of villagers by providing food, income, employment and nutritional security to millions of small and marginal farmers and many other contributions to rural development. Even post disasters, besides the threat of loss of fodder, there is no such cost or terms and conditions needed to be fulfilled to opt for animal husbandry as a livelihood option. During the survey it was seen that people are willing to adopt this and there is a huge scope for animal husbandry. Due to inter-dependence of livestock and agriculture sector it does not need much innovation in technology but only a shift from nomadic pastoralism to multi-faceted opportunities associated with animal husbandry.

POAL 4- Apiculture-In Uttarkashi, due to the diversity in flora, topography and occupational structure of people, beekeeping can be a diversified form of occupation. Although beekeeping has been adapted by various villagers but

that is due to habitat preferences or comes under subsistence farming. This rural sector needs to be enhanced by appropriate tools, support systems and bring them to the forefront. This honey from the forestry sector will be very useful and of high quality because it is free from insecticidal treatments. It will be useful for poverty alleviation and social uplifting of poor villagers who would participate in the beekeeping and honey culture.

POAL 5- Pisciculture-Trout farming project has been undertaken in the district, the project report would help the government in finding business opportunities for local people as well as to explore export avenues, as the demand for the trout is growing world-wide. As the first step, the government is producing fingerlings of the trout at its three fish farms in the Uttarkashi and Chamoli districts. Two lakh fingerlings were currently being produced in these three farms an official said. With the market rate of trouts hovering around Rs 500 per kg, the government has also asked the revenue and forest departments to stop the illegal fishing of the trout, which is generally found at a height above 4,000 feet and at temperatures 5-10 degree Celsius. From these farms, the fingerlings will be transferred to various rivers like the Tons, the Assiganga, the Balquila and the Pinder, which are generally snow-fed. The government is also setting up a packaging plant in Pantnagar to package the fish. Three varieties of trouts are found in Uttaranchal--Brown Trout, Rainbow Trout and Snow Trout. Rainbow trout has high demand in Britain, France and other European nations. Hence with best class packaging, branding and marketing, there is ample opportunity to commercialize this option for livelihood.

Other POALs- in order to diversify livelihood options, special attention needs to be given to the off-farm activities that are being taken place though in small

numbers but hold good potential. This includes, small-scale industries, candle making, tourism related activities, perfume making, agarbatti making , tailoring and embroidery as alternative sources of income that can be full time or part time activities. These skills can also be used at different times of year when agricultural work is in low demand and supplementary income is needed. Many villages in Bhatwari block have the comparative advantage of growing some precious rare herbs that they are using for the making of religious goods like dhoop, agarbatti etc. With special reference to Chinyalisaur and Bhatwari, bee-keeping and poultry farming are one of the growing livelihood options and possess immense potential of being effective possible livelihood option.

Human –Wildlife conflict and livelihood - To identify the possibilities of alternative livelihood post-disaster in the villages, under circumstances of HWC, from the survey it was found that as human population expands and natural habitats shrink, people and animals are increasingly coming into conflict over living space and food. People lose their crops, livestock, property, and sometimes their lives. During the survey there was one similar problem being faced by villagers across the district, including the three blocks that were covered, which was the problem of human-wildlife conflict which is one of the most challenging task in wildlife conservation also. People and wildlife are competing for limited resources, for land, food and water, and too often it is the large predator species such as leopards, wild boars, large monkeys etc that end up in the worst conflict situations with a rapidly-growing human population. The habitat of the animals under the umbrella of development, is increasingly fragmented and movement corridors are blocked. Human Wildlife Conflict is a very severe problem for farmers as well as non-farmers. The increasing HWC has initiated a threat and negativity among the villagers, and this has accounted for most of the villagers to quit farming and migrate in

search of alternative livelihood. The field investigators, on discussion with farmers, came across many ways to tackle this problem of animal attack.

1. Chakhbandi – a very efficient step to aggregate the land. It will be easier to keep check and apply techniques to save the crops from animals.
2. Enhancing Horticulture & Floriculture- flowers are not an attraction among the monkeys, boars and even bears.
3. Poly houses – if poly houses are set up on a large scale this will keep the animals away; besides the poly houses keep the ideal temperature, adequate amount of water in the rainy seasons thereby helping in the increase of yield and quality of production irrespective of the weather conditions.
4. Planting of fruit trees in higher altitude of habitation or settlement so that those animals get their food in those places and do not interfere with villagers.

USING VILLAGE AMENITIES-

It was observed that the possible most effective livelihood option for more than 50% of the female in all the three blocks and about 42% of young men from Naugaon is to work in a food processing unit. This will not only bring in their best talent but also be helpful for the efficient working of the units. Young men from Bhatwari and Chinyalisaur, are not open to working in a food processing unit, whereas youth of Naugaon. However there is need for generating awareness about the livelihood options, especially among the young generation. Young men in Bhatwari are either willing to work in a computer coaching institute (36%) or work in tourism related employment

opportunities like being a tourist guide (46%) or a private driver (18%). Similar is the case of Chinyalisaur block, where possible livelihood option for 54% young men is computer coaching centre and 46% in tourism related jobs.

Other possible livelihood options for the female households are candle making, knitting garments, and tailoring. The beautiful hills of Uttarakhand are the adobe of the craft of weaving wool, initiated by the women of the villages. In Naugaon as mentioned earlier, possible employment opportunity is either to be employed in a food processing unit or work in handicrafts and handlooms (55%).

During the survey it was found that generally old people take the charge of rearing, shearing the cattle. For men above 40 years, animal husbandry and agriculture and allied activities are most suitable livelihood option.

UNIQUE PRODUCTS OF ZONES AND LIVELIHOOD

Very significant result from the field that shows the need to specialize some zone with their unique product and brand them-

1. *Guldavri* and lillies in Naini
2. Potato chips in Yamunotri
3. Apples of Khasrali
4. Tomatoes of Naugaon
5. Mushrooms of Bhatia

During the survey it was found that there are numerous opportunities of creating new employment and enhancing livelihood of people from agriculture and its allied activities. The primary sector is self-sufficient in providing livelihood to the villages of Uttarkashi. There is high scale production of tomatoes, potatoes and apple. This surplus production can be efficiently channelized for livelihood options, by setting up of large or small

scale food processing units. For example in Himachal model Potato Research Institutes can be set up.

It is interesting to recognize the post-disaster conditions of the two worst hit villages of Uttarkashi district of Chinlayisaur block. The villages, **Malli** and **Dharkot** lost a lot of agricultural land, infrastructure, livestock and the crops sown which was their potential income. However it was reported by villagers that three years hence, the victimized villagers did not receive any sort of compensation for their loss, or no reconstruction of damaged property has been taken place. The village is still under the process of recovery from the disaster of 2013, with whatever lands that is left to sustain some agriculture, they are under a constant attack of wild animals that destroy their production. Due to these reasons, there has been a tremendous fall in the production activities, and as a result there is a structural shift in occupation from farming to daily wage work. **Malli** has a good production of fruits whereas **Dharkot** also relishes comparative advantages in the production of the pulses, but to the dismay they lack marketing knowledge and knowledge to commercialize this production. There has been an increment in land fragmentation as a result of traditional social responsibilities and washing away of lands in the disaster. This has resulted in the landholdings to be small and scattered specially in the hilly regions. Since fruits and vegetables being high value are important in raising the incomes of the farmers besides creating employment opportunities, these villages must be given special attention with respect to the production. Due to the frequency of disasters, people have switched to a more stable and relatively predictable source of income. To retain the well-being of the villagers and also the state, the region-specific resources must be optimally utilized and relative knowledge[giving due importance to the indigenous knowledge of the local people of the region] and training must be

provided to the farmers, about effective marketing infrastructure, warehousing, processing and also pricing.

SOME CASE STUDIES

DHARI- village is at 41km distance from Naugaon. The village has a small farmers market for the adjacent villages and also holds a storage place for apple production for the farmers of other neighboring villages. The productivity of land is high as fields show promising yields of apples and peas. Besides the problem of irrigation, the village is also suffering from the constant human-wildlife conflict; the destructive nature of boars and monkeys destroys the whole yield of the villagers. One of the lady said, *“Agar sarkaar kuch logo ko niyukt kar de in bandaro ko bhagane ke liye to is se ek to gaon ka bhala hoga krishi ke liye , aur logo ko rozgaar bhi milega.”* The monkeys are so violent that they had scared away the dogs also and they destroyed all the crops leaving very little produce. The village is devoid of any assistance or guidance from government or non-government institutions. Since the village is a hub for farmers market, special care needs to be catered in the direction of severe human- wildlife conflict.

DHARIVALLI village is a beautiful valley located in Naugaon Block of Uttarkashi district. The occupational structure is varied; however agriculture remains the main occupation of Dharivali. One peculiar characteristic of the village is that the female sex ratio of the village is high and the whole economy of the village is held by the women. The production of apples and tomatoes is very high and consistent. This production can be commercialized by creating awareness, setting up food processing units and skill development training which will help in optimum utilization of region-specific resources. The youth of the village is forcefully employed in the agricultural sector, if the food processing units are set up, this will curb disguised unemployment by generating employment.

SUNARA is a one of the beautiful villages in the Naugaon block of Uttarkashi district. People are engaged in different professions like, teaching, army, police, employed in government and private institutions. Nevertheless, agriculture and tourism are the main occupations of the village. The village enjoys comparative advantage of producing apple, tomato, peas, and *rajma* and of possessing a beautiful lake which has a huge scope in fishery. Employment along with optimum utilization of resources can be initiated if the lake is used for fishing purposes. *Sunara* needs proper linkages with the main market, so that the comparative advantage of the village can be made beneficial for the state and the villages also.

Bijori- is an unfortunate village in the district of Uttarkashi. The village is suffering from innumerable problems starting from shortage of necessary resources like fertile soil, scarcity of water and irrigation in the village, livestock and appropriate infrastructure. As a result of this the economic condition and standard of living of the people has been poor and is deteriorating over time. The village is devoid of proper education and medical facilities. Due to all these reasons people have started migrating from the village at a very rapid rate. There is an acute need for alternative livelihood options in Bijori.

KAFNOL is a village located on the top of a hill and is 45km from the main market in Naugaon block in Uttarkashi district. The village lies in the landslide area and is a victim of the 2013 disaster, thereby experiencing a huge loss of agricultural land and infrastructure. The main occupation is agriculture but the people are engaged in subsistence farming. Even though subsistence farming prevails but after the destruction of farmlands, the yield is not even enough for the limited people living in the family. The agricultural sector has been worst hit and is still suffering the repercussions of the disaster. Since the hilly districts are dependent on rain for irrigation purposes, the canal which was the only alternative source of irrigation, are still damaged. Another problem associated with the farmlands is that of human-animal conflict. The wild animals, mainly monkeys and boars destroyed almost all crops sown, leaving very little produce.

India has been considered as harbinger in the art of natural dyeing. However the art of using natural dyes has diminished over generations due to lack of awareness and advent of technology and dyeing science. During the survey it was found that Kafnol village of Uttarkashi district possesses a very rare type of grass, which is locally known as **jhula grass**. This grass is used for the purpose of dyeing. These natural dyes can are non-toxic, has inherited less side effects and have low pollution. There are numerous opportunities of creating new employment and enhancing income and potential of people by utilizing this resource.

Neri is a village in the Chinlayisaur block of Uttarkashi district. The village is 50km from the concrete roads. Neri comes under the complete disaster prone area. Landslides are a recurring routine in the village because of which the villagers live in anxiety and fear. The cause of the landslides, according to the local people is because of the establishment of the hydropower project *JalVidyut Nigam* on the Bhagirathi River. Besides this the village farmlands have low productivity, and the yield is not adequate for subsistence needs alone. The village also suffers from Human-Wildlife conflict, therefore whatever little is produced is also destroyed by the animals, especially wild boars. Despite the problems being agriculture –related, due to lack of awareness and knowledge people do not switch or think of alternative livelihood options.

JogatMalla-village of Chinlayisaur lies on the China border. Due to its geographical location, the village lacks connectivity to basic infrastructure and inaccessibility to basic amenities. Like other villages, this village also depends on agriculture for livelihood, but due to various changes the agricultural sector is also worsening. Due to this, some people are engaged as *purohits[priests]* while the others are slowly and gradually migrating from the village, in search of alternative livelihood. However during the survey it was observed that 5km away from JogatMalla there is a stretch of good fertile soil, suitable for the cultivation of apple. With the help of introduction of the necessary skills and technologies, if the cultivation and production starts, the villagers can experience livelihood options

and can cater to the problem of migration also. Another livelihood option can be generated by utilizing the scenic beauty and location of the village by making it a tourist place; this will benefit the villagers by generation of employment and will also come in favour of the connectivity of the village.

Jeshtwari and **Adni** are two beautifully situated villages in the lap of Himalayas, in Uttarkashi district of Uttarakhand. Similar to other villages, the main source of livelihood is agriculture. These villages are bestowed upon with the production of a very rare and peculiar type of vegetation, locally known as *chollu*. There is overproduction of this vegetation in this particular region. There is a great potential for generation of employment and alternative livelihood through this resource for the purpose of oil extracting because this oil has huge commercial value. Due to lack of awareness and knowledge of the product, the resource is lying idle. If an oil mill is set up or the oil that is extracted from the particular plant is linked with the pharmaceutical industry, there will be a remarkable achievement and upgrading of the villages.

During the survey it was interesting to recognize the post-disaster conditions of the two worst hit villages of Uttarkashi district of Chinlayisaur block. The villages, **Malli** and **Dharkot** lost a lot of agricultural land, infrastructure, livestock and the crops sown which was their potential income. However it was astonishing to find that 3 years hence, the victimized villagers did not receive any sort of compensation for their loss, or no reconstruction of damaged property has been taken place. The village is still under the process of recovery from the disaster of 2013, with whatever lands that is left they are under a constant attack of wild animals that destroy their production. Due to these reasons, there has been a tremendous fall in the production and as a result there is a structural shift in occupation from farming to daily wage work. Malli has a good production of fruits whereas Dharkot also relishes comparative advantages in the production of the pulses, but to the dismay they lack marketing knowledge and knowledge to commercialize this production, as a result of which the produce is left idle.

Harsil is one of the hidden jewels of Uttarakhand offering ample scope for nature and adventure lovers. Harsil is situated on the banks of Bhagirathi and is at a 75km distance from Uttarkashi. The occupational structure of Harsil gives equal weightage to agriculture and tourism. The village has had a remarkable progress over the time and has set a milestone for the other villages in many fields. Harsil is a completely polythene free village and has been awarded with Nirmal Gram award. This particular village is endowed with immense resources, be it types of fruits, vegetables, fresh water or rare herbs. Due to its topography and beauty the village is a very famous tourist spot, and that has provided people with employment and exposure to new thinking. As a result, the youth is becoming aware and migrating to other places for better education. The villagers are involved in the making of *hawan samagri* and other related products which includes precious herbs like *padam*, *ganga*, *tulsi*, *bhramkamal* etc. Other herbs like *aatis*, *korai* and *taimur* are also precious are not being put to any use, however if they are tested and put to some use, it can be beneficial for the scientists and can also prove to be an alternative source for livelihood. The lady pradhan of Harshil Basanti Devi aged around 85 told us with pain how people are getting migrated and how such a thing can be stopped by encouraging cottage industries and quality education. She spoke of possibility of Agarbatti, Dry flower usables , perfumes etc in her area and promised to extend fullest cooperation of villagers.

Need to specialize some zone with their unique product and brand them-

Guldavri and lillies in Naini

Potato related products in Yamunotri belt

Apples of khasrali

Tomatoes of Naugaon

Mushrooms of Bhatia

Apples of Harshil area

Jhingora and Mudwa of Bhatwari

During the survey it was found that there are numerous opportunities of creating new employment and enhancing livelihood of people from agriculture and its allied activities. The primary sector is self-sufficient in providing livelihood to the villages of Uttarkashi. There is high scale production of tomatoes, potatoes and apple. This abundant production can be efficiently channelized for livelihood options, by setting up of large or small scale food processing units.

YAMUNOTRI BELT- The whole yamunotri belt is endowed with potato cultivation. The land of Ranachatti, Shyanachatti, JankiChatti, Khasrali have remarkable production of good quality potatoes.

KHARSALI- is one of the most beautiful villages on the way to Yamunotri. Mythologically. this village is where Goddess Yamunotri descends down and rests in the winter season. For about a decade this village was bestowed upon with the production of potato, so much so that the production was enough for subsistence needs and for marketing purposes also. But with time the production of potatoes exceeded the market demand and thereby leading to ill consequences. The prices of the potatoes fall in the market and overproduction also created storage problems for the villagers. Subsequently some of the farmers realized that the location of the village, its altitude, soil and extent of snowfall are best suited for production of apple and therefore switched to the apple production.

This particular study of this village opens us to a few facts. One fact is that instead of switching to other production, due to lack of appropriate knowledge and linkages to the market, the overproduction of potatoes could have been utilized into processing other value added products like potato chips, potato powder, potato papads etc. This would have provided an alternative livelihood for farmers as well as non-farmers and also in creating a balance between the demand and supply. Therefore here is an acute need to train people and make them aware, because if the production of apples and potatoes is done simultaneously, there will be optimum utilization of the resources and it will not only benefit the particular village or villagers but also be a helping hand in the development of Uttarkashi as a whole.

APPLE-the production of apple has been a blessing for the villagers of Uttarkashi. Since Uttarakhand is a pilgrimage center, linking apple orchards in the hill State to tourism can go a long way in boosting the apple sales as well as tourism, especially during the apple ripening time which is the same as *yatra* season. The upper belt of Uttarkashi is best suited for the production of apples of almost all types, like the Royal, Golden or Spur. The production of apples is rich in both quantity as well as quality and for most of the people production and sale of apples is the main source of livelihood. During the field visit it was seen that apple is one of the fruits that needs good storage system because it is difficult to preserve and store. Since there is no other source of storage except private storages in Naugaoan area, the private owners charge exorbitant prices from the farmers for storage or buy apples from them at lower rates but sell at the market rates. There is an urgent need for the government to set up a cold storage unit to protect the interest of the farmers so that they get their well-deserved results.

There are a number of other opportunities associated with the production of apples which are not being acknowledged. If we compare the state of Uttarakhand and Himachal Pradesh, it is evident that the economy of Himachal has risen manifold. One of the reasons is that people of Himachal have been successful in optimally utilizing their indigenous knowledge and local resources and generation of alternative livelihood options. One remarkable example is that from the production of apples itself they have created innumerable opportunities of employment. Similarly, if apple processing units are set up, people who do not possess farms and are between jobs, can be given employment opportunities. Apples should be processed into apple jams, chutney, juice, pickles, sweets etc. Role of the government in setting up of plants, interlinking markets and distribution process is very important. This process besides providing alternative options of employment and raising the standards of living will be cost effective and economical because of the easily available and accessible raw materials.

FLORICULTURE- is a very good and fortunate option for alternative livelihood. A special case is of **Naini** village. The village is endowed with immensely beautiful varieties of flowers. The Himalayan Action Research Centre (HARC), a non-profit organisation working in Uttarakhand since 1988, adopted Naini and Kemi villages in Uttarkashi district with an objective to assist the villagers in integrated and sustainable development based on indigenous knowledge. During the interview with officials of HARC it came into light that they saw the potential of floriculture in the villages, but when they introduced the idea to the villagers, it was very difficult to convince them to take horticulture as profession. Once they started yielding good returns from floriculture and horticulture, they encountered the worth of the flowers especially *goldawri*. HARC officials distributed seeds to farmers to motivate them towards floriculture, and as time passed they have extended it to a large scale now.

One very good comparative advantage that floriculture enjoys is that it does not come under the threat of the human-animal conflict which is one of the major concerns in the hilly regions. The flowers are not of any interest to the monkeys, boars or even bears. Due to good returns, negligible human-wildlife conflict and a good functional market, the villagers have incorporated this in their cropping patterns. The cultivation of tomatoes end by the month of august and September, followed by peas and then *Guldavri* on November and *December*. Naini is linked with a market in Delhi but transportation and all weather road are is need; this will provide good exposure of Uttarkashi floriculture. A laboratory of floriculture is being set up in the Naini village Naugaon, to keep the fertility of the soil and spread it in the adjoining villages.

MUSHROOM-Naugaon block of Uttarkashi in the recent times has set an example in the diversification of agriculture, be it floriculture, horticulture, apple orchards or tomatoes or even mushrooms. During the survey in the Bhatia village, from the local sources the field investigators came to know that the CM of Uttarakhand declared Bhatia as “mushroom valley”. The commercialization of mushrooms is new to the village of Bhatia, and was introduced two years ago. Considering the amount of time given to this particular genre, it has been a huge success in terms of high yielding returns. The only loophole that was visible was the availability of adequate market infrastructure. Government needs to interfere in the initial process of guidance and providing equipment for storage and packaging and distribution process in the nearby towns and cities.

APICULTURE- In Uttarkashi, due to the diversity in flora, topography and occupational structure of people, beekeeping can be a diversified form of occupation. Beekeeping has been adapted by various villagers but not at commercial level . This rural sector needs to be enhanced by appropriate tools, support systems and bring them to the forefront. This honey from the forestry sector will be very useful and of high quality because it is free from insecticidal treatments. It will be useful for poverty alleviation and improvement and social uplifting of poor villagers who would participate in the beekeeping and honey culture.

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Databases

Other than Field Survey

DMMC, Uttarkashi

Gram Panchayat Vibhag, Vidhan Bhavan , Joshiyara, Uttarkashi

Directorate of Economics and Statistics, Uttarkashi

Census 2001-2011

Sample Number	Name of Gram Panchayat	Number of villages	Name of villages
0U0B01	Sukhi	1	Sukhi
0U0B02	Harsil	1	Harsil
0U0B03	Naitala	1	Naitala
0U0B04	Jamak	1	Jamak
0U0B05	Heena	1	Heena
0U0B06	Thalan	1	Thalan
0U0B07	Joshiyada	1	Joshiyada
0U0B08	Agodha	1	Agodha
0U0B09	Ladari(Bikaspuram)	1	Ladari
0U0B10	Kishanpur	1	Kishanpur
0U0B11	Pata	1	Pata
0U0B12	Seku	1	Seku
0U0B13	Dhanpur	1	Dhanpur
0U0B14	Huri	1	Huri
0U0B15	Bagori	1	Bagori
0U0B16	Dharali	1	Dharali
0U0B17	Maneri	2	Maneri ,Kaneth
0U0B18	Didsari	1	Didsari
0U0B22	Athali	1	Athali
0U0B23	Kansaidh	1	Kansaidh
0U0B24	Uttro	1	Uttro
0U0B25	Gajoli	1	Gajoli
0U0B26	Dasra	2	Dasra,Dandalka
0U0B27	Raithal	1	Raithal
0U0B28	Kyark	1	Kyark
0U0B29	Bhatwari	1	Bhatwari
0U0B30	Gorsali	2	Gorsali,Jokani
0U0B31	Pahi	1	Pahi

ANNEXURE I

I. BHATWARI

II. CHINYALISAUR

Sample Number	Name of Gram Panchayat	Number of villages	Name of villages
0U0C01	Neri	1	Neri
0U0C02	Garhwal gad	1	Garhwal gad
0U0C03	Kumrara	1	Kumrara
0U0C04	ThatiDichli	3	Dichli,Bhengwaalgaun,Shreekot
0U0C05	JogatMalla	1	Jagatmalla
0U0C06	Rauntal	1	Rauntal
0U0C07	Khand	1	Khand
0U0C08	Kansi	1	Kansi
0U0C09	Jestwadi	1	Jestwari
0U0C10	TipreeDaski	1	TipreeDaski
0U0C11	Shrikot	1	Shrikot
0U0C12	Bhadkot	1	Bhadkot
0U0C13	Barol	1	Barol
0U0C14	Morgi	1	Morgi
0U0C15	Margaun	1	Margaun
0U0C16	New Kalsi	1	NayiKhalsi
0U0C17	Khalsi	1	Khalsi
0U0C18	JogatTalla	1	JogatTalla
0U0C19	Badsi	1	Badsi
0U0C20	Adni	2	Adni,Kot
0U0C21	Gadhth	1	Gadath
0U0C22	Dharkot	1	Dharkot
0U0C23	Malli	1	Malli
0U0C24	KyariDaski	1	KyariDaski
0U0C25	Kyaridichli	2	Kyaridichli
0U0C26	Tulyara	2	Tulyara, Gayladi

III. NAUGAON

Sample Number	Name of Gram Panchayat	Number of villages	Name of villages
0U0N01	Manjiyali	1	Manjiyali
0U0N02	Sunara	1	Sunara
0U0N03	Muradhi	2	Muradhi,Sapeta
0U0N04	Dhariwalli (Mulana)	3	Dhariwalli,Billa,Sauli
0U0N05	Bijori	2	Bijori,Kufan
0U0N06	Tiya	1	Tiya
0U0N07	Dharipalli	1	Dharipalli
0U0N08	Kalogi	1	Kalogi
0U0N09	Himrol	1	Himrol
0U0N10	Kafnol	1	Kafnol
0U0N11	sar (Dingadi)	2	Diyari,Bhunangoan
0U0N12	Gangtadi	1	Gangtadi
0U0N13	Massu	2	Massu,Rajgadi
0U0N14	Gadoli	4	Gadoli,Paudi,Sinna,Jayestadi
0U0N15	Ponti	1	Ponti
0U0N16	Bagasu	2	Bagasu,Balaasi
0U0N17	Kharsaali	1	Kharsaali
0U0N18	Beef	1	Beef
0U0N19	Ranageed	1	Ranageed
0U0N20	Bajri	1	Bajri
0U0N21	Khaneda	1	Khaneda
0U0N22	BadkotPollgaun	2	Pollgaun,Chataanga
0U0N23	Nandgaun	1	Nandgaun
0U0N24	Bhatia	1	Bhatia
0U0N25	Bhatia Pratham	1	Bhatia Pratham
0U0N26	Naini	1	Naini
0U0N27	Kuwa	3	Kuwa,Chudi,Teda
0U0N28	Kandari	1	Kandari
0U0N29	Godeen	2	Godeen,Khamunditalli
0U0N30	Gatu	2	Gatu,Bursi
0U0N31	Bachladi	2	Bachladi,Pmadi
0U0N32	Upraadi	2	Upraadi, Sada
0U0N33	Dakhyaatgaon	1	Dakhyaatgaon

0U0N34	Dharali	1	Dharali
0U0N35	Simalsaari	1	Simalsaari
0U0N36	Matiyali	1	Matiyali
0U0N37	Binsi	1	Binsi
0U0N38	Tunaalka	1	Tunaalka

ANNEXURE II

A Study on Possibilities of Alternative Livelihood Activities and Utilization of Available Village Amenities Post Disaster: A Case of Uttarkashi District of Uttarakhand

Village Panchayat Schedule

Date: - Field Investigator:-
Gram Panchayat:- No of villages with
name:-
Panchayat Pradhan's Name: - Age: - Contact No:-
Gender: - Serving As Panchayat
Pradhan for:-
NyayPanchayat: - Educational
Qualification:-
Block: - Tehsil:-
Location of Village: - Top Hill () Mid Hill () Valley ()

I. Village household details

1.	Total population of village:-	
2.	Total working male	
3.	Total non-working male	
4.	Total working Female:-	
5.	Total non-working female	
6.	Total number of households in the village:-	
7.	Total number of households who demanded employment	
8.	Total number of households who were provided employment	
9.	Area of the village	

10.	Distance of the village from the motorable road (km)	
11.	Total number of households locked for last 3 months	
12.	No. of women headed household	
13.	No of BPL households	
14.	No. of SC households	
15.	No. of ST households	

II. Present Occupation Categories and Alternative Livelihood options in the village Panchayat

1.	Majority of population in occupation:-[eg. agriculture, tourism and related, defense, others]		
2.	Maximum nature of land holding in the village Panchayat	Less than 25Nali	
		26-50 Nali	
		51-100 Nali	
		More than 100 Nali	
	Present Livelihood:-Occupation Categories in the village	Number of household	%
	• Defense and allied activities		
	• Teaching (Government + Private)		
	• Agriculture and allied		
	• Small Business		
	• Government. Administration		
	• Private Companies		
	• Tourism related Occupation		
	• Other (driver, waiter, <i>purohit etc</i>)		

	Number of household working under NREGA during of reporting month		
	Maximum Nature of Employment [Tick the option]	1. Seasonal [] 2. Regular []	
IV.	Livelihood option other than regular work in the village Panchayat	Yes/No	Remarks
	• Handicraft	No = 0 Yes = 1	
	• Animal Husbandry	No = 0 Yes = 1	
	• Dairy Farming	No = 0 Yes = 1	
	• Fishery	No = 0 Yes = 1	
	• Stone craft	No = 0 Yes = 1	
	• Food processing – JAM, ACHAR , JUICE etc	No = 0 Yes = 1	
	• Handloom	No = 0 Yes = 1	
	• Poultry	No = 0 Yes = 1	
	• Bee Keeping	No = 0 Yes = 1	
	• Mule owners	No = 0 Yes = 1	
	• Other	No = 0 Yes = 1	

1)	Village Amenities	Coordinates (FIs took coordinates of selected amenities as available in the area)	
•	GOVT. PS		
•	GOVT UPS		
•	GOVT Inter College		
•	Private PS		
•	Private UPS		
•	Private Inter College		
•	GOVT Degree College		
•	Professional Institution		
•	Nearest Nationalized Bank		
•	Nearest Cooperative Bank		
•	Nearest RRB		
•	Nearest PHC		
•	Nearest Hospital		
•	Nearest Petrol-Diesel Outlet		
•	Nearest Medical store		
•	Nearest Grocery		
•	Nearest Veg. Store		
•	Nearest Stationary		
•	Nearest Gas Agency		
•	Nearest Electrician's shop		
•	Nearest Flour Mill		
•	Nearest Functional Market		
•	AnganBadi		
•	Vet nary hospital		
•	Pond for fishery		
•	Post office		
•	Guest house/ hotel etc		

III. Basic Village Amenities

2)	(a.)Which is the most frequent public transport available?	
	(b)Which is the most frequent mode of transport used?	
3)	What is the Primary source of drinking water in the village?	
4)	Is there an availability of irrigation facility? If yes then what kind?	
5)	What is the comparative advantage of the village-	
	<ul style="list-style-type: none"> In terms of agriculture and allied e.g. Crop, Fruits, other material for example (ringal) 	
	<ul style="list-style-type: none"> In term of Skill [human resource skill] 	
	<ul style="list-style-type: none"> In terms of village amenities 	
	<ul style="list-style-type: none"> In terms of natural resources 	

IV. Migration and NGO's working for livelihood

1)	What is the nature of migration?	Yes/No
	<ul style="list-style-type: none"> Nearby Village and Market 	
	<ul style="list-style-type: none"> Nearby town 	
	<ul style="list-style-type: none"> Far Away Town 	
2)	What is the extent of migration in terms of distance of migration ?	Yes/No
	<ul style="list-style-type: none"> Less than 200 kms 	
	<ul style="list-style-type: none"> 200- 500 Km 	

	•500 – 1000 km	
	•1000-2000 km	
	•More than 2000 km	
3)	What are the reasons of migration?	Yes/No
	•Only Livelihood	
	•Only Education	
	•Livelihood and education both	
	•Wants to leave village	
	•Other (Please Mention)	

4)	Access to Credit-	a.) Formal ()% b.) Informal ()%
5)	Attendance in gram Sabha meeting	a.) Male ()% b.) Female ()%
6)	How many households are attached to a	
	a) CBO (Community based organization)	
	b) SHG/Samooch	
	c) MahilaMangal Dal,	
	d) Hariyali,	
	e) Kissan Dal,	

	d) YuvakMandal Dal	
	NGO's working for livelihood	

V. Possible alternative [new] livelihood options

1)	What according to you are the possibilities of alternative [new] livelihood options in the village?	Yes/No	Remarks
	a) Carpentry		
	b) Small Scale Food processing Units		
	c) Small Scale Dairy Farming		
	d) Candle Making		
	e) Woolen garments knitting unit		
	f) Handicrafts		
	g) Tourist Guide		
	h) Coaching centers (For competitive Exam)/ Computer centre Franchise		
	i) Other		

VI. How is livelihood affected in your area by human animal conflict?

- VII. How can be village Amenities be optimally utilized for generating livelihood.[e.g training programs]
- VIII. How much has livelihood affected after disaster.
- IX. Any livelihood training held in last one year by Govt. or NGO?Name the organization and nature of training? How many people from GP were trained?Mention the after effect of training
- X. Stimulation of possible new alternative livelihood option for target population
- Female housewife -
 - Young girls-
 - Young boys-
 - Adult male (more than 40 years) –

Include a case study where applicable

DATE

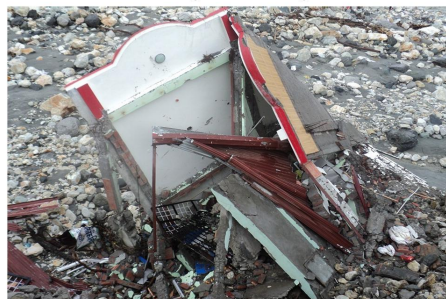
FIELD

INVESTIGATOR

Houses Damaged at Gaongri
due to Flood on 3-8-12



Damaged Cooperative Bank
building in Gangori



Damaged PWD Colony, Hotels, shops near river side at Joshiyara



SOME GLIMPSES FROM THE FIELD



