

Report

Exploring Traditional Practices of Local Communities in Uttarkashi, Bageshwar and Pithoragarh Districts of Uttarakhand



**Disaster Mitigation and Management
Centre (DMMC)
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Government of Uttarakhand**

2015

Preface

Traditional knowledge is the knowledge gained over centuries, transmitted orally from generation to generation and most often linked to agriculture, animal husbandry, health, horticulture and forestry. Resources in the higher reaches of Himalaya have always been scarce. The challenges put forth by climatic and physiographic conditions further make human survival difficult in this terrain. Based on traditional knowledge of generations the people living in this region fine-tuned and developed resource management practices that ensure optimal utilization of the available resources. The present study is an attempt to document the resource management practices of the people living in the valleys of Himalayas that are sensitive to changes in climatic parameters and to assess the impact of these changes on life support strategy of the people together with the efforts being made by them to cope up with this impact. Various elements of sustainability in traditional practices of local communities in three districts have also been explored. Dovetailing elements of modern science and technology with traditional practices is required for popularization and acceptability by masses. Traditional Practices can make a significant contribution to sustainable development and allow a sustainable future for all.

We are grateful to DISA for carrying out this study for DMMC. We thank Avanish Kumar Singh, Principal Investigator, Ms. Saroj Dhyani, Ms. Monika Nautiyal, Mr. Budhhi Singh Gosai, Mr. Uttam Panwar and entire DISA Team, Ms. Sanchita Kaur, DMMC and Mrs. Sweta Rawat, UNDP India for data collection and data analysis. Partial support from GoI-UNDP Project 'Enhancing institutional and community Resilience to Disasters and Climate change' is acknowledged.

We acknowledge guidance and support from Chief Secretary, Government of Uttarakhand Shri N. Ravishanker, Additional Chief Secretary, Government of Uttarakhand Shri Rakesh Sharma and Secretary, Disaster Management, Government of Uttarakhand Shri R. Meenakshi Sundaram.

All the colleagues at DMMC are thanked and without their commitment, support, cooperation and encouragement this work would not have been possible. Last but not the least, thanks are due for all the participants who have given their time and inputs for this report.

29th May 2015

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Acknowledgement

Traditional practices, cultural pattern and local knowhow tell a glorious story of human survival and sustainability against most challenging environment. Himalayan culture and traditions provide even deeper insights regarding coping and survival against external changes and hazards. Traditional wisdom and knowledge interwoven in local cultural patterns and practices are most important clue towards addressing the contemporary issues of development and climate change. This becomes more relevant in light of recent disastrous events. There is a need to enhance our understanding regarding traditional knowledge and wisdom and efforts should be made to include them in current development models. Commissioning of this research by DMMC, Uttarakhand is an important step in this direction. This report is an outcome of support provided by DMMC in formulating the research, extensive field visits and in-house analysis of data collected from different sources.

Dr. Piyoosh Routela, Executive Director, DMMC, has provided guidance at crucial stages of research design, besides facilitating the data collection process, especially in conducting key informant interviews (KIIs) with state and district level officials. We are thankful to many state, district, block and village level officials and PRI members for enriching our understanding. Many elderly people from all across the three districts provided immense support and information during field visits. We thank community members for their participation, patience and information. This research would have been impossible without active support, suggestions and input from Mrs. Shweta Rawat of DMMC. We are thankful to Ms. Sanchita Kaur, Mr. Budhhi Singh Gusai, and Mr. Uttam Panwar, for their enthusiasm, courage and hard work. Ms. Sanchita played important role in data collection. Field team put themselves under high risk while crossing the dangerous patches of slides and mountain for reaching to communities. Ms. Saroj Dhyani, effectively coordinated various components of research process, e.g., design, data collection, analysis and report writing. Special thanks to entire team of Development Insights for Sustainable Development (DISA), Sangeeta, Manisha, Ritu, Nidhi, Praveen, Atul, Mrigank, Amar and Rachna and Isha for their immense contribution in transcription, content analysis, report writing and for their unprecedented commitment, especially during festive time. Finally yet importantly is the support and participation of community members, which made this research possible.

Avanish Kumar Singh,
Principal Investigator

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1. Introduction

The tectonic origin, multiple folds and faults associated with Hindu Kush-Himalayan range have put the entire region among high seismic zones of the world. Current topography and other geomorphological characteristics of the area have been the outcome of millions of years of tectonic activities, erosions by torrents of mighty rivers, and mass movements. Most importantly, these forces have not yet been stabilized and Himalaya is still in the process of formation. It puts a range of challenges before settlers, which includes, extreme vertical limits, vast stretches of difficult and unstable terrain, various hazards and freezing temperature. Success and sustainability of human settlements in such a fragile and unstable region has been a glorious story of human survival. However, this story has been written on the ground of traditional wisdom and sustainable practices of mountainous communities. Centuries of keen observations, cultural assimilation, learning by trials and errors, have been accentuated into various forms of traditional wisdom and practices, which have been reflected in unique socio-cultural, institutional and technological spheres of local societies.

Historical perspectives of settlement in Himalayas, especially in Uttarakhand, and cultural orientations of these settlers would be essential to understand the nature and background of local traditions. There are numerous ethnic groups resided in Uttarakhand Himalayan areas who settled here in course of time, with their different cultural traits, socio-religious institutions and economic activities. Northern and upper reaches of Himalayas in the state are inhabited by tribes, mostly Bhotias, which reflect a perfect blending of Hinduism and Tibetan Buddhism, in their nomadic way of life. Animal husbandry and subsistent farming, besides trade between Tibet and India had been their traditional occupations and they had adopted seasonal migration to cope with the extreme climatic conditions. Middle Himalayas of Garhwal and Kumaun regions were under the influence of Hinduism since very old time as there are many references of these areas in Puranas and other ancient Hindu literature. However, more stable residential villages, with comparatively intensive farming, emerged with the advent of new migrants (mostly Rajputs) from the plains of Indian subcontinent when they fled from Muslim invasions during 14th century and afterward.

First challenge before settlers in Himalayan region was to address the issue of safe shelter against multiple destabilizing forces as various types of seismic waves and heterogeneous topography generated complex waves, including most devastating lateral motions. Another challenge in hilly terrain was the landslides and flash floods. Water and cultivable land were another requirement for sustaining the community life in such areas. Wise selection of residential areas and construction of earthquake resistant building architecture made the sustainability of generations possible in hilly areas. Various earthquake resistant and safe architectural traditions emerged as a cultural response to the challenges in different eco-niches. Secondly, local communities have developed sustainable

agricultural practices by wise use of available natural resources. Evolution of terrace farming can be seen as a major achievement of mountainous communities against the oddities of hilly topography. There are numerous examples of local technologies, knowledge and traditional wisdom to tell the stories of survival and sustainability of mountainous communities against extreme conditions.

In the light of alarming report on climate change and variability along with recent extreme event, a more comprehensive response mechanism to impact-mitigation and preparedness is required. However, such response could not be effective without appropriate partnership with local communities. Local community and its members are the primary stakeholders and therefore their concerns, must be brought into center stage. More important is to understand the traditional wisdom of local communities and to integrate them with mitigation and response mechanism at appropriate levels. This research aims at widening our understandings on traditions, practices and technologies, which could be effectively integrated with such efforts. Following were the specific objectives of the research.

- To understand the nature and various form of traditional practices of local communities in Uttarkashi, Bageshwar and Pithoragarh, which are relevant to hazard mitigation
- To understand various climate adaptation of local communities embedded in traditional practices
- To explore various elements of sustainability in traditional practices of local communities in three districts

2. Research Methodology and geographical area covered

This research report depends on and PRA activities based primary sources of information and review of literature on relevant books and reports. Literature review provided a context for designing research tools and activities. Entire research was conducted in participatory framework as local community members were the key source of providing information and validating the findings of old researches. Community level group discussions, in depth one to one interviews, Key informant interviews and participatory observations were the key research tool conducted with local communities in selected villages of three district.

Data collection process was conducted under a participatory framework in which emphasis was given on developing effective rapport with community members. Shortage of time was a key constrain in the process. Purposive sampling was applied for choosing villages, and for the selection of participants.

Selection of district and blocks: Purposive sampling was applied in selection of districts and villages. This method is often used in qualitative research for maximizing relevant representation based on prior information. These districts represented two dominant Himalayan

cultures of Uttarakhand, i.e., Kumauni and Garhwali. Uttarkashi represented Garhwali culture, whereas, Pithoragarh and Bageshwar represented Kumauni. Pithoragarh (Dharchula) also covered impacts of Tibetan and Nepalese affect on local Kumauni culture. Villages were also covered based on purposive sampling. Stress was given on optimal representation of Hilly culture and traditions of Uttarakhand. Majority of the villages covered under the research were located in interior areas. However, few roadside villages in all three districts were selected to understand the impact of modernity on local traditions. A total of 24 GDs, 36 IDIs and 10 KIIs were conducted with men and women with special emphasis on covering elderly people.

Data collection: A comprehensive analysis plan was developed before data collection. One-day training was conducted at DMMC, Dehradun for orientation of research associates and field researchers. Research team, comprising principal investigator, senior researcher and research associates, visited selected villages in three districts between 10th October to 10th December 2014. As process was based on PRA paradigm, two local members, with good understanding of local knowledge and culture, were included in the team for effective interaction with community. These members interacted with villagers before major research activities and catalyses them for participation in PRA based research activities. Proceedings of FGDs, IDIs and KIIs were audio recorded after obtaining prior consent from participants. At few place (Bagori, Uttarkashi) recordings could not be done due to technical process and therefore, in such cases, findings were based on field notes. Efforts were made to find local experts on various issues related to traditional practices. Many such experts were interviewed during field visits.

Content analysis: Analysis team of DISA, was extensively involved in transcription, and content analysis under the supervision of principal investigator and senior researcher. Recordings were transcribed and transcripts were entered into computer software. A dedicated analysis team coded the transcripts on the basis of a comprehensive coding plan. Contents of coded computer outputs were interpreted and then findings were extracted.

3. Key findings:

3.1. Hazards and housing

Overview:

Indo-Tibet trade and initial settlements: Many participants shared stories of how their ancestors selected the place for village settlement. These stories of local communities passed onto generations by oral traditions. Many participants shared, especially in Darma and Johar Valleys in Pithoragarh and Bogori village of Uttarkashi that initially villages in higher Himalayan region came into existence along with Indo-Tibet trade route. One participant in Dhapa villages,

Pithoragarh said, "Our ancestors were involved into trade between India and Tibet and settled at various spots on the route wherever they find suitable place." Ancestors of these villagers actively participated in the trade that was primarily based on barter system in which they exchanged their animals with other essential goods such as salt, woolen cloths, etc., in Tibet. One participant shared during group discussion in Jimia, Pithoragarh, "so, by that time (when village settled) Indo-Tibet trade was flourishing. Our ancestors used to visit Tibet with their ponies and goats and brought wools, in exchange. Other region why we settled here was the fact that this place was a good pastureland with dense forest and good availability of grass."

Pastoral nomads and temporary shelters: Majority of the responses show that initial settlements, especially in higher Himalayan region, were not permanent in nature and that suitable places out of many other halts of nomadic routes were selected for longer stay. Availability of water, fodder and possibilities of subsistence agriculture were primary factors, which played key role in selection of places for longer stay, according to many participants. One participant of Kujjan, Uttarkashi, said, "Yes, our ancestors came to this place for grazing their herds of cows, buffaloes, goats and sheep. They find the place suitable and built their temporary shelters and then settled here." Similarly, one participant of group discussion, in Khet, Pithoragarh, shared the story of his village, "that time were pastoral nomads, we raised goats. Our goats sat on this place and then we occupied this place as there were plenty of fodder available here, and finally they (ancestors) settled here." Bhotias in Pithoragarh and Uttarkashi still migrate to lower places during winters. Community members of Bagori (Uttarkashi) migrate to Dunda (Uttarkashi) during winters to avoid extreme cold near Gangotri glacier. Similarly, communities in many villages located on Kailash Mansarovar route migrate to Dharchula and other lower areas during winters to avoid extreme cold weather.

From temporary shelters to permanent villages: many such temporary shelters were turned into full-fledged villages in course of time. Pastoral nomads selected few places for longer stay due to availability of water, fodder and possibilities of subsistence agriculture. Many initial settlers invited their relatives and friends to live with them at these new places and slowly and slowly, these shelters were populated with new immigrants. One participant of discussion in Karmi, Bageshwar described the process in following words, "when initial families reached here they were involved in grazing cows and buffaloes. These were their initial activities. Then they invited friends for company so that this place would become live. Slowly and slowly an entire village had developed at this place as relatives of other immigrants also reached here." With the advent of migrants from plains of Indian subcontinent permanent village emerged in Himalayan region, which were different from Bhotias' shelters in many respects. These immigrants were not nomads and they preferred permanence rather than mobility of former. Although, animals were equally important to them, however, they relied much on agriculture.

They brought comparatively advance agricultural techniques from plains and this might have a reason for higher production and capital generation.

Safety against hazards: Analysis of the responses and observations suggests that soil testing, knowledge of climate and geography played key role in selecting the place for village. A participant of group discussion in Gajoli, Uttarkashi, said, *"Our ancestors examined everything before settling here. Earlier there were experts who could tell you after testing the soil that particular land is good or bad."* A comprehensive observation of old villages suggests that safety against hydrological and geological hazards was key criteria for selecting the places for villages, especially for residential areas. Most of the old villages or residential areas (30 out of 42) visited during field research are located at safer places. These villages are situated at comfortable heights and distances from major river streams. However, Bhatwari (market area), and Gangnani, in Uttarkashi, Gattabagar, Neu, Sobla, Khet (settlement near road), Madkot (market area), in Pithoragarh and Khaibagar, Rithabagar, in Bageshwar are new settlements emerged either after construction of highways or commissioning of big HEPs, in vicinity. These new areas were settled against the basic traditional wisdom of keeping the safe distance from main river streams and therefore suffered heavy tolls, during recent disasters. On the other hand, villages settled on traditional wisdom remained roughly safe. Although, many of these villages have lost valuable fertile land during extreme rainfall and landslides, however, buildings and human lives in the residential areas were remained safe. Only exception was Jimia, Pithoragarh, which is reportedly located on a major seismic fault, had experienced massive landslide caused due to seismicity.

Evolution of climate and earthquake resistant building:

Photo- 1 Village Papdi



Information collected from participants and from various other sources suggest that initial village communities in Himalayan region resided in temporary shelter houses at multiple points on trade routes and while grazing their cattle, goats and sheep. These light shelter houses were made of timber, grass and to some extent stones as per the sedentary life style of pastoral nomads. However, with influx of new migrants from plains, effective assimilation took place between cultures of local tribes and Hinduism. This fusion was evolved into various unique regional Himalayan cultures. Advance technologies of Indo-gangetic plains, higher productivity with comparatively extensive agricultural practices, more settled life and local knowledge supported this evolution. Soon carefully designed elaborate buildings replaced the light wooden shelter houses in the residential landscapes of Himalayan villages. These architectural advancements were the cultural responses to extreme climatic conditions as well as various hazards. Research team made extensive observations of traditional buildings in villages of both Kumaun and Garhwal region and analyzed various specifications in context of climate and hazards related challenges to local communities. Most common characteristics of traditional house building techniques are being discussed here.



Soil testing: Although, modern RCC or RBC buildings do not rely much on soil testing and selection of the place for house building, however, traditional architecture of both Kumau and Garhwal include these steps as the essential parts of construction. One elderly person in Khati, Bageshwar, informed; *"yes, the first step in house building is the soil testing. We examine the land and then we consult the priest who tells us about good or bad things regarding the land."* Similarly, one person in Gajoli, Uttarkashi, shared, *"earlier there were expert priests who examined the land and then guided us before any construction."* However, with spread of economic prosperity more and more people are relying on modern house building technology, which is not suitable in adverse conditions of the hilly region. Research team observed that most of these new buildings did not suffered the shocks generated by recent floods. However, many old buildings were still standing on their places, for centuries. Few people have started practicing the age-old traditions, especially after witnessing the impact of recent disasters on new houses. One participant of group discussion in Karmi, Bageshwar revealed, *"no one in hour village followed the practice of examination of soil and land. People in our*

place did not have much faith on these things. However, for last four to five years, people have started taking the soil sample to pundits for the examination. You can say astrological knowledge related to this is now becoming popular."

Small doors and windows: It was observed that old houses had some characteristics, which insulate the residents from freezing cold. These houses had small doors and windows. Most of the houses had only one or two small windows. One elderly person in Harshil, Uttarkashi shared, "earlier people used to build small windows and doors and therefore these houses were warmer than cemented houses." One participant of group discussion in Wachham, Bageshwar, described, "yes (we built small windows), because there is extensive snowfall in our village and if we built bigger doors and windows then cold would enter our houses. Although, many people are constructing big doors and windows, in fashion, however, these houses remain cold." One participant of group discussion in Senar, Pithoragarh stressed on the same fact as the reason behind construction of small houses with shorter windows and doors, in past, "then there were wide spread poverty. People did not have food and clothes for their children. Winters were more freezing in past. These houses kept the people warm even during winters because of their size and shorter doors and windows, which insulate the air from outside."



Shorter houses and floors: It was also observed that old houses had thick walls and were shorter. These measures play crucial role in keeping the internal temperature comparatively higher than outside. One participant of the group discussion in Khet, Pithoragarh described the reasons behind lower ceiling, "the reason behind this is that people were poor that time and they did not have warm beds and blankets, economic conditions were not good. People used jute bags and paddy as bed. Shorter houses kept them warm." One old person in Kujjan, Uttarkashi, shared similar views, "people made houses shorter in height as they did not have enough money. They experienced more snowfall than today and these houses remained warm during snowfall." Traditional houses were not expensive, and even poor people can build them with local resources and personal labor. "

Extensive use of timber: Extensive uses of timber also play a role of effective insulator. Same person described the benefits of traditional wooden houses in following words, "wooden houses remain warm, especially during cold and this is the main reason people still built

these houses.” Concrete houses are not effective in extreme cold seasons as the same person further said, “Timber is found in abundance in our area. Although many people have built concrete houses, however, these structures are not successful in places like ours. Wooden houses are best suited according to geographical conditions of this place. Cemented houses on the other hand become warmer during summers and colder during winters.” Another elderly person from Sama, Bageshwar described other benefits of traditional houses in comparison to modern cemented structures in following words, “concrete houses are not good for health. Old houses are good for health as extensive use of mud and clay is beneficial. Cemented houses are suitable for any season as they contain extensive moisture during rains, become hotter during summers and colder during winters. This is how they are not beneficial to health.”

Multi-storied structure: it was observed that these traditional houses were three to four storied and rectangular in structure. This structure provides extra strength to these buildings against various seismic forces. Ground floor is used as cattle shed and it is called 'got', 'obra,' or 'byar'. First floor is called 'dupur' and second 'manzi'. One elderly person in Khat, Bageshwar, described the structure in following words, “dupur means first floor, manzi means second and ground floor where we keep our cow is called 'byar.' Earlier cows stay in byar, but now people shift them outside at separate place. And, if the house has enough depth than front portion is reserved for guests and the place behind that for cows.” And if the house has four stories instead of three than the third floor is called 'Pand'. A participant of group discussion in Bhankoli, Uttarkashi, shared, “in our place we call 'got' to first, 'manzi' to second and 'pand' to third floor. We use got as kitchen and we take rest there. We also keep our animals, e.g., cows, goats, etc., in at got. Other floors are preferred for sleeping.” This structure and nomenclature were widely used across three districts with minor variations. One person from Harshil, Uttarkashi shared a different nomenclature. He said, “ground floor is called 'obra', and we keep our cows in there. Upper floor is called 'bond' and we use it as kitchen. Kitchen was made at first floor due to reason that the heat can melt the snow deposited at roof.”



3.2. Traditional practices regarding agriculture

Temporary nature of farming practices of mobile pastoral nomadic tribes was changed into comparatively intensive agricultural of more settled local communities in most of the Himalayan region. This transformation was supported with cultural assimilation, shared wisdom and responses against harsh agro-climatic conditions. These traditional wisdom and knowledge have been embedded in the various types of adaptations at different levels. These adaptations and traditional wisdom are also reflected in religious and cultural festivals along with unique agricultural practices and specialized knowledge.

Terrace Farming: Unique agricultural practices in Himalayan region have been evolved as a response to the harsh agro-climatic and geographical challenges. Local communities internalized most of the harsh environmental oddities into their favor through harmonious adaptation. Terracing the slope was among initial steps in mountain region towards adaptations as this was the only possible available option. Although most of the farmers could not describe the reason behind terracing, however, most of them were agreed that this technique was the only possible method of cultivation in sloppy areas of hills. One agricultural expert in Barsu, Uttarkashi, shared his insights regarding terracing, *"people might have tried to level the slop to make terraces. It was not possible to level the entire area (mountain); therefore, they built terraces on slopes.* He further pointed out the benefits of terracing, *"it was also useful to check the soil erosion as this structure is an effective measure against that."*

Ensuring natural flow of water:

Water logging could instigate landslides, especially during rainy season and therefore local communities have learned that there is a deadly combination between water and soil, especially in hilly area. One person of Kujjan, Uttarkashi, shared, *"we do not bind our forms with ridges as water logging could cause landslides."* It was



also important to understand that traditional water management in hilly areas was focused on ensuring safe and natural water flow in rainy season. It was also observed that terraces were not ridged in the hilly areas. Same farmer in Kujjan, explained the reason for this, *"we do not make it to ensure smooth flow of rainwater out of our farms. We cultivate potatoes during rainy season and it will rot in case of even slight water logging."*

Crop rotation: It is important to understand that traditional agricultural practices of Himalayan region has been the outcome of the communities' response to harsh agro-climatic realities and which was reflected in the form of deeper linkage between local culture and need of protecting the biodiversity of the region. The practice of 'Baranaza,' was at the core of traditional cropping practices. Baranaza means a practice of alternate cropping of twelve grains and pulses, through which diversity, composition and rotation of crops could be effectively maintained for addressing the issues of sustainability and food security in the region. However, shift in agricultural practices has reduced the production of essential agricultural produces. Many participants shared that their ancestors were less dependant on market for food than today's generation. One elderly person in Kujjan, Uttarkashi, shared, "earlier kidney bean, rice, choulai (amaranth), kodo (kodo millet), jau (millet), gehu (wheat), bajra (millet), cheena, koni, were extensively cultivated and included in regular diet. However, now people purchase most of these things from market, as there is less production in our fields."

Photo 6- Women in Jhala

Mixed cropping: Many participants reported it in all the three districts that mixed cropping is dominantly practiced in hilly areas. Many farmers shared that they mix many supporting crops with main crops. These supporting crop included; amaranth (*Amaranthus oleracea*), buckwheat (*Fagopyrum esculentum*), naked barley (*Hordeum himalayens*), maize (*Zea mays*), kidney bean (*Phaseolus vulgaris*), horse-grams (*Macrotyloma uni florum*) and finger millet. An in-depth analysis of this practice again points towards close linkage between traditional practices and natural diversity. Uniqueness of qualities and characteristics of different areas in the same farm was recognized by local communities and in order to optimize the production mixed cropping pattern was adopted. Various types of millets and pulses were mixed with main crop under this system. However, at main crop occupy the middle area of the field.



It is also important to note that mixed cropping maintains the soil fertility by retaining the nutrient contents in soil as majority of supporting crops enrich the field by nitrogen fixation. Other crops which are mixed with major crops include; various types traditional soybean (*Glycinesoja*, *Glysinemax*, *Glysine*), adjuke bean (*V. Angularis*), blackgram (*V. mungo*), cow peas (*V. Unguiculata*), pigeon pea (*Cajanuscajan*), perilla (*Perillafrutescens*), sesame

(Sesamum indicum), tickweed (Cleome viscosa) hemp (Cannabis sativa) roselle (Roselle, hibiscus subdarifa) and cucumber (Cucumis sativus).

Seed conservation and storage: evidences shows that conservation of seeds and knowledge exchange regarding cultivation practices are embedded in socio-cultural and religious fabric of local communities. Traditionally, some portion of the agricultural produce is preserved for maintaining productivity and conserving biodiversity. Many farmers shared various practices regarding conservation and storage of grains. One participant of group discussion shared in Khet, Pithoragarh, *"the box in which we store grains is made of wood, we call it bakkar. It is around five fits big and it contains two compartments. We store paddy in one and maze in other. Bugs cannot reach into this box."* Many farmers shared that they use local herbs and plants as pesticides to save them from bugs. One participant of discussion in Jemia, Pithoragarh, shared, *"we put leaves of a special tree for protecting seeds from infections. We call it 'dall.' Smell of these leaves keep the ghun (woodworm) and away."*

Storage of serials and other food items is an important traditional measure, especially in hilly areas, to mitigate the impact of impact of unusual climatic conditions. However, it was observed, especially in Uttarakashi, that a separate structure was constructed outside the main house for storage of grain and other food items.

Local community members call it 'Kothar.' It was shared by members of local community, in many places, that reason behind keeping the kothar outside the house was to protect the damages of grain from possible risk of fire, as most of the houses were made of wood in past. One elderly person in Kujjan, Uttarkashi, said, *"We keep eatables in kothar. And you know houses in old times were made of hey, grass and timber and there were always a risk of fire, those days."* Similarly, another elderly person in Harshil, Uttarkashi, said, *"Houses were made of timber and there were risks of catching instant fire. Therefore in order to protect the grains it was a practice to keep the storage outside."*



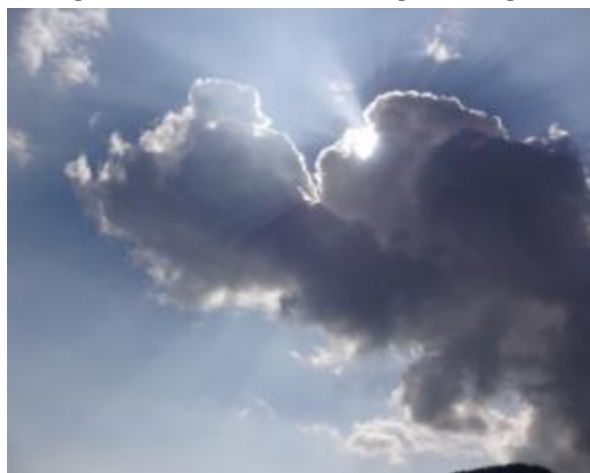
Figure 7- Seed Storage (Bakkar) in Agoda

Similar practices were also observed at some places in Bageshwar and Pithoragarh. One person of Karmi, Bagewhar described this practice in detail, *"They built it outside as there were smoke and heat inside the houses. Heat and Smoke damage the grains. Besides main storage could*

be saved in case of fire in houses. It also prevents grains from bugs and pests. The keys of these structures are always given to the women of households." Many farmers shared other practices of storage and conservation of agricultural produces. One farmer in Khati, Baheshwar elaborately described the process of how community members keep the potatoes safe, in following words, "we dig a pit in lad to store potatoes. We first clear the pit, and then make a bed of grass beneath. Next put the potatoes inside it, again pack it by grass, and then cover it by soil. If we directly cover it by soil then potatoes will rot. This is why we first make a bed and then cover it by grass. We can store as much potatoes as we want. If we store potatoes in wooden buggar (box) then we could store up to 2-3 quintals. We do not apply any kind of chemicals. We only apply cow dung or sheep dung." Such examples clearly show that local communities' have effective knowledge of conservation of seeds and storage.

Religious and cultural mechanism for sustainable agriculture:

Communities in Uttarakhand has elaborate religious and cultural practices in the forms of festivals, which enabled them to make joint assessments on climate, and exchange their knowledge regarding cropping, seed conservation and productivity. Most of these festivals begin with worshipping local gods and goddesses, with offerings of produce to main deity of the village. These practices promote seed preservation and conservation of biodiversity. These cultural practices follow Vikram Samvat calendar. Few cultural practices promote testing of different seeds promoting crop diversity and conservation. Harela festival, which is celebrated on



the Sankranti of Assar month (Vikram Samvat), is specifically related to seed testing of different species. Culturally, every family has to participate in three testing. Harela stands for first, followed by two testing in each occasion of both Navaratri festivals. During Navratri, community members sow minimum seven types of grains and pulses in their households or in temple on the bed of soil collected from their fields. This is a symbolic cultural reflection of seed conservation, crop rotation and mixing.

Climate prediction: Agricultural practices in Himalayan region are closely related to nature and seasonal cycle. A shift in the pattern of precipitation can affect the crop cycle and production, especially in rain-fed farming of Uttarakhand. However, local communities addressed this issue with developing capability of climate prediction based on various sings and variable. This technique is still practiced

by traditional farmers in remote areas of Himalayan region. Most of the participants shared that these predictions stood almost accurate. One farmer in Kujjan, Uttarkashi, said, *"Yes, farmers make such predictions. When cloud they see red cloud (at morning) they predict a rainfall and when they see similar cloud at evening they calculate that sky would soon be clear."* Many other participants shared similar information. One local expert in Barsu, Uttarkashi, shared, *"we calculate the nature and forms of climate, in coming days, on the basis of months and in 90% cases it is proved to be accurate."* However, many experts and community members shared that climate change and variability have affected the communities abilities to assess and predict. The same expert further shared, *"However, now the balance is disturbed. Earlier, snow got melted before March-April and farmers got ready for start a new cropping season."* Several other participants pointed towards this effect of climate change on community's capabilities and agricultural practices.

3.3. Traditional knowledge: geography, forest and ethno medicine

Overview:

Local communities in Himalayan region survived against climatic and geographical extremes, and developed coping mechanisms at various levels. Extensive exposure to geographical and climatic ranges provided them with deeper insights regarding static elements and dynamic nature of external environment. They faced challenges from glacier, high peaks, mighty rivers, and dense forests, wild animals around their settlements, and while moving from one place to other. Similarly, they faced incidences of snowfalls, avalanches, heavy rains, landslides, earthquakes and floods for centuries. However, they had to cope up with all these extremes and events for survival. Coping with different challenges at various levels was only possible with extensive experiences, keen observations and evolved wisdom. Accentuated knowledge and wisdom of centuries transferred from generations to generations and embedded into cultural fabrics and traditional practices of local communities. Many times these knowledge and wisdom are practiced, unconsciously and many times specialized know how and knowledge transferred through oral and other traditional methods to generations. Traditional knowledge and practices encompass each aspect of the life.

A. Knowledge of local geography and climate:

Knowledge of old hilly routes: Early human settlers in Himalayan region were mostly pastoral nomads, partially involved in inter regional barter trades. They had to remain mobile, usually with large herds of animals. They had to cross, mighty rivers, glaciers, dense forests and high peaks. They accentuated extensive knowledge regarding static and dynamic elements of local geography. They knew various shortcuts, hilly passes and higher altitude routes to reach distant valleys in very short time. Many participants in all the three districts shared about how their ancestors used these shortcuts to reach distant places. One elderly person in Dhapa, Pithoragarh shared, *"when we were young we reached from Munsyari to Haldwani using shortcuts in very short time. We used the old route, which crosses various peaks, rivers and valleys. Our ancestors did not need any road. However, many of these old routes are disappeared without use as people depend on road based transportation."*

Many participants shared, in Uttarkashi and Pithoragarh that they used old hilly routes to reach to nearest markets during long disruptions in road transportation, during, and after June 2013 events. One participant of the group discussion in Khet, Pithoragarh, shared, *"although government employed helicopters to transport pregnant women and injured persons during that time, however, after month's long blockade many people used old routes which crosses many tops and peaks to reach Dharchula. Many people from our village went to Dharchula for medicines and essential supplies."* Many participants in other villages shared similar responses. Many participants in Mukhwa, Jhala and Markonda shared similar examples of how they reached Bhatvari via routes through mountaintops. It was reported by many villagers of Pinder valley, Bageshwar, that when road transportation disrupted during winters or in case of any emergency local people preferred to reach Bharadi via 'Dhakudi top.' This route is still in good conditions as local community frequently uses it. Vulnerabilities of local communities against extreme conditions have enhanced with the complete dependency on road transportation.

Photo 10- Group Discussion at Kujjan

Knowledge about geohazards and safe spots: it was reported by many participants in different villages that during peak hours of extreme events, in June 2013, entire community shifted to safer spots. One participant in Pyankti, Pithoragarh shared, *"we knew that this place was not safe and therefore villagers moved to that mountain (showing towards a separate mountain peak which was less high than the altitude of pyankti village) and camped there. We knew for long that this place was safer and we stayed there for many days."* Similar experiences were shared by a participant in Mukhwa, Uttarkashi, *"when it seemed that*



now things are turning very serious after 72 three days of continuous rain, entire village took shelter at a house which was assumed to be situated at safe place." It was found that local community members knew minutest details regarding hazards and danger zones. They were also aware of the seasonality of these risks. These local details were very specific in nature and could be effectively used in developing local hazard mitigation strategies.

Prediction of unusual events by reading the signs of animals: few

participants shared that their ancestor could assess the possibilities of unusual physical events after reading the sings of animals, birds and even insects. One elderly person in Sama, Bageshwar shared, "when Snake come above the ground from their holes then it should be understood that something is wrong. Cows start crying without reason, before such events. Similarly, many birds start making unusual noise or sounds. Earlier people tried to interpret the meanings



of such sounds and voices and predicted the occurrence. And it is logical to think that snake can hear the waves and can calculate that any earthquake is coming." However, majority of the participants in this research were either not aware of such practices or denied their existence. For example, one participant of group discussion in Senar, Pithoragarh said, "No there are no such signs of these events. Sometimes clouds accumulate due to formation of monsoon. And when the height of such cloud formation is about 2 km then there is very high rainfall."

Knowledge of local climate and related dynamics: One elderly person in Dhapa, Pithoragarh, pointed his fingers towards sky and said, "you know when we see dense cloud on the top of that peek (indicating towards a peak near Panchachuli range), especially before noon, clearly there would be rain within two or three hours." One member of Bhotia community in Bagori, Uttarkashi, shared, "when we enter jungle with our goats and sheep we are totally disconnected from community. Our decisions in the jungle are generally based on our experiences and extensive knowledge of forest. We see certain species of herbs and can calculate that there must be a water source at nearby places. We listen to various sounds coming from jungle and make assumptions regarding various things. We know which place is dangerous and what precautions are needed at what location." One participant of group discussion shared in Kujjan, Uttarkashi, "we

Photo 11- Group discussion at Bagori

migrate to our chhanies (temporary cattle sheds at higher altitude) during rainy seasons and we know at what time we need to move."

Similarly, one participant in Senar, Pithoragarh, said, "We exactly know that how much time of continuous rain would turn this spring into a danger zone." Participants in Mukhwa and Markonda in Uttarkashi shared that they listen to the sound of river flow and other water bodies and calculate the risk. At many places in it was shared by local communities that they can calculate the exact time of rain based on position of cloud and time. When research team was in Pinder Valley, Bageshwar, it was told by local community that if Sunderdunga (peak) were covered by cloud then it would rain within twenty-four hours. Exactly same event took place and it rained within prescribed time. Local communities have numerous information regarding local climate and related dynamics. In case of any prominent risk and history of extreme events, such information can be transferred from one generation to other through local stories and folklore. Such information can be useful in developing a local strategy for hazard mitigation.



B. Forest Conservation

Forest play important role in life of mountain community. It directly provides fodder, fuel, medicines and many other produces and eatables. However, responses from various villages show that local community deeply understands the indirect benefits and services provided by forest ecosystem. Ensuring appropriate climate and rainfall, land stability, protection against various hazards, and biodiversity are the main services it provides to local communities. There are evidences that forest was consciously protected in past through various community level regulations. Many forests were named after gods and goddesses in order to ensure protection. Few participants shared that there are restrictions on cutting the trees in certain areas of forest. One participant of the Khet, Pithoragarh, said, "although, forest in our village is not named after any god or goddess, however, there is a rule to protect the trees in the 100 meter periphery of temple as it is presumed that they belong to local god." Many participants in all three districts shared that community members avoid cutting green tree; instead, they prefer to use damaged tree or stems lying in the jungle.

[Photo 12- Forest view in Bhelatipri](#)

Conservation of Forest as a protection cover: communities in Himalayan region have experienced numerous upheavals in past and developed various safety mechanisms against them. Protection of residential areas against mass movements and run-offs is the biggest challenge before them. They consciously protect their forest near their houses as a protection cover. Community members in Mukhwa, Uttarkashi, have consciously protected a specific patch of forest for generations. Many villagers in Mukhwa shared that this jungle have saved them from many avalanche and cloudburst in past. One community member in Mukhwa shared, *"we preserve this forest for centuries as it has saved us from cloud bust, excessive rainfall, avalanche and rock falls. No one in our village cut a single tree from this forest."* Similarly, a villager in Wachham, Bageshwar, said about the forest existed above the residential area of the village, *"we protect this as you know avalanche and rock falls are common occurrence in our village, however, this forest neutralizes the force."*

C. Ethno Medicine:

Extensive knowledge of medicinal plants: Himalaya is rich in biodiversity and many valuable species of medicinal herbs are found exclusively in this area. Local community has extensive knowledge of different uses of floral biodiversity of the region. Although, this specialized knowledge is fading away very rapidly, however, elderly people in villages still have valuable information



Photo 13-Medicinal plants in alpine meadow

regarding medicinal and other uses of different species of flora. One member of group discussion in Madkot, Pithoragarh, said, *"Although we don't know much but, our elders have extensive knowledge. However, number of such elderly persons is decreasing with time."* It seems that new generation is less dependent on traditional medicinal practices of local communities. One participant of discussion in Khati, Bageshwar said, *"we have everything in our forests including 'hathijadi', atis, katisgopal, thal, etc., however now people don't go there to bring these medicines."*

Many participants informed about traditional treatment of various health problems and diseases. A participant of discussion in Madkot, Pithoragarh, shared, *"for obstruction in urination, or in stone, we use the leaves and roots of a plant. Its leaves are flat like arbi (colocasia). It is found on stones and we collect it from Jungle."* However, most commonly used and frequently mentioned medicine was Atis (*Aconitum Heterophyllum*). Use of Atis as local medicine in fever and

other problems was mentioned in most of the villages covered in this research. One elderly person, in Harshil, Uttarkashi, described the use of Atis and other medicines in following words, "in case of fever we use 'atis' either with water or with milk. For people suffering from diabetes, a small piece of 'kodayi' can be taken with water. If children or someone is feeling stomachache we give him or her powdered zeera (cumin)."

Local community was also aware of use of local medicines, in case of health problems in cattle and other animals. One participant of group discussion in Bhankoli, Uttarkashi, said, "Cows suffer rarely with any health problem. However, buffaloes suffer during deliveries and then we give her 'chemidolu.' We apply medicinal herbs in case of injuries. Generally, we give them to drink 'ghee' (clarified butter) or 'muthha' (yoghurt liquid) to drink in most of the cases, which relieve them from such problems. If there is any infection of microbes or worms, we give them 'jagiani.' Similarly, one person shared about the use of walnuts' leaves in Khurpa disease (foot and mouth disease), "earlier khurpa disease was very common in cattle and we used to apply a paste made of akhrot (walnuts) leaves. We apply salt on swellings on joints for 3-4 days." Responses across all the three districts contain many references of similar kinds. Even few community members in Pinder valley showed some medicinal herbs to research team.

4. Conclusion:

A comprehensive look into historical overview, existing practices, cultural traits and social institutions point towards a story of survival and sustainability in different aspects of traditional life style of local communities in Himayalan region. Local communities have developed deeper insights of transforming challenges into opportunities while facing numerous challenges, which threatened their survival and sustainability in one of the most fragile and unstable regions of the world. These insights have been reflected in wisdom of selecting safe places for residences, architecture to survive hazards, wise use of sloppy landscape for agriculture and other economic activities and in preserving ecosystems for survival and sustainability. There has been a both way give and take relation between nature and local communities. This is the real secrete behind this glorious story of human survival. However, with the advent of market based modernity and cultural influence this balance has been broken. Unsustainable technologies, market forces, and modernity have overwhelmed the traditional practices and local ethos. The very concept of development, based on individual growth, has eroded the traditional nature based cultural pattern and practices with modern technology based unsustainable technologies leaving a question mark of survival and sustainability of human life in Himalayan region. Increasing incidences of disasters, mounting losses, impacts of climate change and deepening of hardships of local communities are necessitating a need of rethinking the development model in Himalayan context.

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6. Appendix –I

Tool

समूच चर्चा निर्देशिका

शोध का शीर्षक:

“उत्तराखण्ड के तीन आपदा प्रभावित जिलों में आपदा जोखिम न्यूनीकरण (DRR) एवं अनुकूलन (adaptation) सेसम्बन्धित पारम्परिक ज्ञान एवं बुद्धिमत्ता की पड़ताल पर एक शोध”

आपदा न्यूनीकरण एवं प्रबन्धन केन्द्र,

उत्तराखण्ड शासन,

देहरादून



डेवलपमेन्ट इनसाइट्स फॉर सस्टेनेबल एक्शन (DISA),

शोध में भागीदारी के लिये मौखिक सहमति
(सहमति लेने से पूर्व शोधकर्ता निम्न को पढ़ के सहमतिदाता को सुनाएं)

शोध का शीर्षक: "उत्तराखण्ड के तीन आपदा प्रभावित जिलों में आपदा जोखिम न्यूनीकरण (DRR) एवं अनुकूलन (adaptation) से सम्बन्धित पारम्परिक ज्ञान एवं बुद्धिमत्ता की पड़ताल पर एक शोध"

अध्ययन का उद्देश्य

- हम आपसे डी. एम. एम. सी., उत्तराखण्ड शासन, देहरादून के सहयोग से डेवलपमेंट इनसाइट्स सस्टेनेबल एक्शन द्वारा आपदा के प्रभाव एवं खतरे को कम करने की परम्परागत विधियों एवं ज्ञान से सम्बन्धित शोध में सहयोग एवं भागीदारी का आग्रह करते हैं
- इस भागीदारी के अन्तर्गत एक प्रशिक्षित शोधकर्ता द्वारा स्थानीय समुदाय के सदस्यों के साथ साक्षात्कार का आयोजन किया जायेगा जिसमें आपदा के प्रभाव एवं खतरे को कम करने की परम्परागत विधियों एवं ज्ञान से सम्बन्धित चर्चा करके जानकारी प्राप्त की जायेगी।

अध्ययन में आपकी भूमिका

- उक्त अध्ययन के सन्दर्भ में हमारे सहयोगी शोधकर्ता अलग-अलग उम्र, लिंग एवं सामाजिक-अर्थिक समूहों के सदस्यों से शोध में भाग लेने का आग्रह करेंगे। यदि आप इस शोध में अपनी महत्वपूर्ण भागीदारी के लिये सहमत होते हैं तो आपसे निवेदन है कि अपना 30 से 40 मिनट का समय साक्षात्कार के लिये देने की कृपा कीजिए।
- आपके साथ साक्षात्कार की तिथि एवं समय की सूचना आपको पहले दे दी जायेगी। इस साक्षात्कार में आपकी भागीदारी स्वैच्छिक है अतः किसी प्रश्न का जवाब देना या ना देना पूर्णतः आपकी इच्छा पर निर्भर करेगा। इसके अलावा अगर आप चाहे तो साक्षात्कार किसी भी वक्त समाप्त करने का आग्रह कर सकते हैं।

गोपनीयता

- शोध की आवश्यकताओं एवं विश्लेषण के लिये उक्त साक्षात्कार की ऑडियो रिकार्डिंग की जायेगी। शोध के उपरान्त ऑडियो फाइल नष्ट कर दिया जायेगा एवं आपका नाम या आपसे सम्बन्धित और कोई जानकारी बिना आपकी सहमति से कहीं भी प्रकाशित नहीं की जायेगी।

शोध में आपकी भागीदारी से सम्बन्धित सम्भावित अन्य बातें

- यह सम्भव है कि चर्चा के दौरान शोधकर्ता आपसे कुछ ऐसे प्रश्न पूछें जिससे पिछली घटनाओं एवं आपकी भावनाओं का सम्बन्ध हो अतः हमें उम्मीद है कि आप मानसिक रूप से साक्षात्कार के लिये तैयार होंगे।

यह प्रमाणित किया जाता है कि सहमति प्रदान करने वाले भागीदारों को शोध की प्रकृति, उद्देश्य एवं इसमें उनकी भागीदारी से सम्बन्धित अन्य आवश्यक बातें पढ़ के सुनाई गई हैं एवं समझाया गया है।

सहमति प्राप्त करने वाले शोधकर्ता के हस्ताक्षर

स्थान

दिनांक

शोध का शीर्षक: "उत्तराखण्ड के तीन आपदा प्रभावित जिलों में आपदा जोखिम न्यूनीकरण (DRR) एवं अनुकूलन (adaptation) से सम्बन्धित पारम्परिक ज्ञान एवं बुद्धिमत्ता की पड़ताल पर एक शोध"

समूह चर्चा (GD) निर्देशिका

शोधकर्ता का नाम: _____

साक्षात्कार/चर्चा की तिथि: _____

साक्षात्कार/चर्चा का स्थान: _____

साक्षात्कार/चर्चा का समय _____

शोधकर्ता के विवरण एवं विचार (गांव, समुदाय एवं भागीदार से सम्बन्धित कोई आवश्यक जानकारी)

समूह का विशिष्ट संकेत (कोड)

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गांव का नाम:	ब्लॉक एवं जिला:
सामाजिक समूह:	लिंग समूह:
आयु समूह:	भागीदारों की संख्या:

1. परम्परागत रूप से पहाड़ों में गांव/बस्ती/निवास कहां होता था? (प्रोब: नदी के समीप, खेतों के उपर, पहाड़ी ढाल पर, एवं चोटी के आसपास)
2. बस्ती बसाने या घर बनाने के स्थान का चयन किस प्रकार किया जाता था? क्या इसमें बुजुर्गों/जानकारों की सलाह ली जाती थी? यदि हाँ तो किसकी? ये लोग किस आधार पर स्थान चयन के बारे में परामर्श देते थे? क्या आपको इस विधि पर विश्वास है? क्या यह विधि आज भी प्रचलित है?
3. क्या पहाड़ों में प्रायः बहुमंजिला भवन बनाये जाते थे/ है ? यदि हाँ तो आपकी भाषा में अलग-अलग मंजिलों के लिए क्या-क्या शब्द प्रयोग किये जाते हैं? (प्रोब: भूतल, पहली मंजिल, दूसरी मंजिल, तीसरी मंजिल, चौथी मंजिल)
4. क्या भवन को भूकम्प के प्रभाव से बचाने के लिए नींव को गहरा खोदा जाता था? यदि हाँ तो कितना?
5. क्या भवन निर्माण के पहले नींव को खुला छोड़ा जाता था? यदि हाँ तो क्यों एवं कितने दिन तक?
6. पुराने/परम्परागत घरों में खिड़की दरवाजे छोटे होने का कोई खास वजय था? हाँ तो क्या?
7. आपके अनुसार पुराने/परम्परागत घर ज्यादा सुरक्षित होते थे या आज के सीमेन्ट से बने घर? क्यों?
8. आपके अनुसार पुराने/परम्परागत घर ज्यादा आरामदायक होते थे या आज के सीमेन्ट से बने घर? क्यों?
9. हमारे परम्परागत भवनों ने पूर्व में आये कई भूकम्प के झटकों को झेला है। इन भवनों को भूकम्प रोधी बनाने के लिए क्या कुछ विशेष किया जाता था हाँ तो क्या?
10. क्या आपको लगता है कि आजकल भूस्खलन की घटनाएं ज्यादा होने लगी हैं? हाँ तो क्यों?
11. भूस्खलन ज्यादातर बारिश के मौसम में ही होते हैं। ऐसा क्यों है? क्या पानी और भूस्खलन के मध्य कोई सम्बन्ध है?
12. क्या भूस्खलन से बचने या बारिश के पानी के सुरक्षित निस्तारण के लिए परम्परागत रूप से कुछ किया जाता था? हाँ तो क्या? क्या आपके क्षेत्र में जंगल गूल बनाई जाती थी? हाँ तो इसका क्या महत्व था?
13. पहाड़ों में ज्यादातर लोगों के खेत एक जगह पर नहीं हैं? ऐसा क्यों है?
14. आज पलायन के कारण पहाड़ों के काफी खेत बंजर हो गये हैं? और इनका उचित रख-रखाव भी नहीं हो पाता है, क्या इसका बढ़ रही भूस्खलन की घटनाओं से कुछ सम्बन्ध है? यदि हाँ तो क्या?
15. क्या यह सच है कि परम्परागत रूप से दूर-दराज के खेतों में मेड़ें नहीं बनाई जाती थी? यदि हाँ तो क्यों?
16. क्या आपके क्षेत्र में परम्परागत रूप से चाल/खाल बनाने की प्रथा है? यदि हाँ तो इसका क्या महत्व है?
17. क्या घर से दूर खेतों में ढाल अक्सर बाहर की तरफ होते थे/हैं? यदि हाँ तो क्यों?

18. क्या आपको लगता है कि आपके यहां जो परम्परागत फसल की प्रजातियां थी वो आज की नई प्रजातियों से ज्यादा अच्छी एवं फायदेमन्द थी? यदि हाँ तो किस रूप में?
19. क्या आपको लगता है कि स्थानीय पशु-प्रजातियाँ, बाहरी प्रजातियों की तुलना में यहां के जीवन के लिये ज्यादा उपयुक्त है? यदि हाँ तो किस तरह से?
20. गाय भैस व अन्य जानवरों के लिये स्थान का निर्माण कैसे करते थे?
21. जानवरों में फैलने वाली बिमारियों को कैसे रोकते थे?
22. क्या आसमान के रंग, हवा की दिशा, पानी के रंग या स्तर को देखकर भी कोई मौसम सम्बन्धित पूर्वानुमान लगाये जाते थे? हाँ तो वे क्या थे?
23. क्या जानवरों, कीड़े, मकोड़ो, मच्छलियों और परिंदों को देख कर हमारे पूर्वज मौसम में होने वाली आपदा के बारे में कोई पूर्वानुमान लगाते थे? हाँ तो वो क्या थे?
24. क्या खेती शुरू करने, रोपाई व कटाई के लिए उचित मौसम के पूर्वानुमान की कोई स्थानीय परम्परा थी/है यदि हाँ तो क्या? विस्तार से बताएं?
25. खेती के लिये बीज का संरक्षण कैसे करते थे? इसमें किन बातों का ध्यान रखा जाता था?
26. सुखे एवं बर्फ से फसल की रक्षा कैसे करते थे?
27. भारी बारिश एवं सुखे का पूर्वानुमान कैसे लगाते थे?
28. कटी फसल को कैसे सुरक्षित रखते थे?
29. कीटों एवं जानवरों से फसल की रक्षा कैसे करते थे/हैं?
30. क्या आपके क्षेत्र में जंगलों को देवी-देवताओं के नाम दिये जाने/ अर्पित किय जाने की परम्परा है/थी? यदि हाँ तो ऐसे जंगल कहां हैं? (प्रोब: पहाड़ी के उपर, नदी के किनारे या अन्य) इसका क्या महत्व है?
31. क्या देवी-देवताओं को अर्पित इन वनों के प्रबन्धन के लिये कोई विशेष नियम थे/हैं? यदि हाँ तो क्या?
32. क्या जंगल में लकड़ी/ चारा काटने के परम्परागत नियम या प्रतिबन्ध है? यदि हाँ तो क्या और उनका क्या महत्व है?
33. क्या आपको मालूम है कि कई स्थानों पर कुएं या नौले बनाकर भूजल का उपयोग किया जाता था? यदि हाँ तो जमीन के अन्दर कहां पानी मिलेगा इसका पता कैसे लगाया जाता था?

34. गाँव के लोगों में मच्छरों व पानी से होने वाली बीमारियों को कैसे रोकते हैं?
35. बीमारियों के उपचार के लिए क्या स्थानीय जड़ी-बूटियों का इस्तेमाल होता था? यदि हाँ तो कौन सी?
36. आपके क्षेत्र में आपदा के दौरान भुखमरी एवं कुपोषण से बचने के लिए कोई विशेष परम्परागत तरीका था/है?
37. आपके क्षेत्र में आपदा के दौरान जल की भीषण कमी या प्यास, (dehydration) से बचाव के लिए कोई परम्परागत तरीका था/है?
38. किसी आपदा की स्थिति में कैसे गाँव के सभी लोगों को और आस-पास के गाँवों को सचेत किया जाता था? किस प्रकार से संदेशों को एक स्थान से दूसरे स्थान तक भेजा जाया करते थे? क्या ये तरीके आज भी इस्तेमाल किये जाते हैं और क्या आज भी कारगर हैं।
39. आपदा की स्थिति से लोग एवं समुदाय कैसे उबरते थे एवं जीवन की नई शुरुआत कैसे होती थी? क्या आपदा प्रभावितों की मदद के लिये कुछ सामाजिक नियम हैं या थे?

समाप्ति

हमारी तरफ से ये साक्षात्कार समाप्त होता है अगर आप इसमें कुछ जोड़ना चाहते हैं तो अपनी बात जरूर रखें।

आपने अपना इतना कीमती समय निकाला और अपने अनुभवों को हमारे साथ साझा किया। इसके लिये हम आपका तह दिल से शुक्रिया अदा करते हैं

आपका बहुत बहुत धन्यवाद