

**Local wisdom For Natural Disasters Risk Management:
Ethnography of the District Upper Chitral, KPK Pakistan.**



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2022

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This thesis is submitted to the Department of Anthropology, Quaid-I-Azam University Islamabad, in partial fulfilment of the degree of Masters of Philosophy in Anthropology

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2022**

Formal Declaration

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Javed Ali

ACKNOWLEDGEMENT

It took me almost a year to come up with thesis and now I can finally see the result of my dedication, punctuality and continuous effort in academia. Initially I want to acknowledge that this would not have been possible without the blessings and guidance of Allah. The spirit of seeking knowledge in Islam has always inspired me and have given me courage to any lengths for learning purpose and to equip myself with the competent knowledge trajectories. And I am grateful for availing this opportunity at Quaid-I-Azam University Islamabad, which has given us all the essentials to fit in this pluralistic world around us.

I would not have been able to produce this thesis without the mentorship and assistance by many of the scholarly magnetic people around me, who have entertained my quests and facilitated me throughout this time. I want to extend my heartily gratitude to the gentlewoman, my mentor and supervisor madam Dr. Saadia Abid, for she has always encouraged me and guided my research throughout this time. I acknowledge her unconditional support, her quality time and concern which she has given me despite the chaotic situation of COVID-19 and her already busily occupied schedule. And I am grateful to my teachers altogether from whom I have learned the trajectory knowledge essentials. And I appreciate the faculty and staffs of the department for their assistance and availability at times of need throughout this academic tenure.

I would like to thanks my family and friends for their support at every front and for their affection. Especially my sisters, Sultana and Dilshad who have unreservedly encouraged and supported me throughout this time, and their guidance have directed my potentials limitlessly. I am also thankful to my friend and relatives who have played a vital role in accompanying me in the field s and giving access into case scenarios. Especially Qaisar Iqbal, his knowledge, concern and his encouraging behavior has always been helpful in achieving my goals for the research. Also, I respect and appreciate my community and respondents who managed to give me time for this essential and irrespective of the

pandemic situations and their compulsions have provided consent to respond with the knowledge I was seeking for.

At last, my gratitude to my fellow mates who in many ways have assisted me in compiling this thesis, and I extend my best wishes for their researches.

Javed Ali

DEDICATION

I with my heart felt gratefulness and with genuine gratitude dedicated this thesis to my family, friends and mentors, who have supported me morally, academically and financially. And with immense respect and homesickness I consider my community rightful to deserve the dedication of this work, hence I also dedicate this thesis to my people back at home.

Abstract

The philosophy of Indigenous Knowledge System is contested in the scholastic regimes and amongst the development practitioners. Yet its significance cannot be negated while studying the discourse of indigenous communities and investigating the local wisdom for appropriating contexts for development and growth. The western science has dominated almost the total of other knowledge system prevailing across the world, especially in the developing world where the indigenous knowledge has pledged primordial fidelities for the communities living in remote and rural regions. And in the wake of growing attention towards climate change and building resilient communities, disaster management practices have been disputed for their imposed universality and uniformed contextualization. Hence this study delves the local wisdom or the traditions from indigenous knowledge system in the district Upper Chitral of Khyber Pakhtunkhwa, Pakistan to manage the risks of natural disasters like floods and earthquakes.

To investigate the local wisdom for natural disasters risk management in the research arena, the study has employed qualitative research methods with an ethnographic approach. This study entails two types of data findings which the secondary and primary data findings; the source of secondary data findings is limited to the literary discoveries and reinforcements by means of analyzing selective discourse, while for the primary data findings this study has observed in-depth interviews of key informants and locals, participant observation, on field scrutiny and field notes. The majority of key informants were in their late adulthood and adults, whereas the diversified sample size was considered to check up on the transmission of traditional knowledge and its relevance in the contemporary times.

The modern scientific knowledge system, particularly the western science has dominated the knowledge spheres across the world, irrespective of their age in practice and the context they prevail in. The western scientific dominancy and universality has alienated knowledge system such as the traditional and indigenous knowledge system. A traditional

knowledge practitioner in any part of the world has to prove the significance, relevance and utility of their traditional wisdom by legitimizing it with the principles and tenets of western science. Especially when traditional ecological knowledge and the local wisdom for harmonious traditions with the nature are talked about, the universality of western science negates these native philosophies of unity with the nature. Yet no too late, in the recent past a contagious attention amongst various modern scientific regimes is given to indigenous knowledge as native science, and modern scientist work in the pursuit to incorporate these traditional and indigenous knowledge with those of modern science to achieve maximal efficacy in their courses of interventions.

The natives of the arena have rich traditions of unity and harmony with the discursive world around them. Since the region is settled amidst gigantic mountain ranges, they always been looked at as communities living at multifaceted risks. The tension of climate change and global warming has put the glaciers and weather conditions at unrest, increasing the probabilities of occurrences of floods in the region. And earthquakes in the region have continuously been nightmare for the inhabitants of mountains, living in steeps and among rocks. Despite the continuum of these menacing disasters the community has managed to survive amidst the dilemmas and chaos; their traditional knowledge system has equipped them with knowledge trajectories to cope with the risks posed by these natural disasters. Practices like *Bup Dik*, *Tzaq*, *Yoz Chakek*, *Yardoyi* and erecting the mud adobes as shelters have managed to provide them ways to get an escape from their vulnerabilities caused by the geographical compulsions. Together the beliefs associated with these practices and their traditions guiding them in emergencies have crafted a system of traditions which keep their social and natural world in harmony.

Key Words: Indigenous Knowledge System, Local Wisdom, Traditional beliefs and practices, traditions of harmony, Khow, Upper Chitral

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1. INTRODUCTION

The recognition and functional aspects of indigenous knowledge system have always been a subject to the heated debates amongst various established scholars and philosophical doctrines. The western-science¹ has occupied the minds of knowledge seekers to the extent that other than scientific the rest is perceived as archaic or traditional. Although the indigenous knowledge based traditional practices have been relevant in their contexts since the formative times of their conception, yet they have been neglected, for their source of origin is different from the widely accepted western science. Based on prolong observations, earned experiences, crafted values and complied beliefs, the indigenous knowledge system has a variety to offer for conflict resolutions, resource mobilization and risks management. Such is the case of traditional practices and local wisdoms which are adhered to manage conflicts and risks like the disaster projections and threats.

Since the world is going through drastic climatic changes and different time zones are having various vulnerabilities, it is not possible for the universal scientific tools to manage the hazards unfirmly. There are places that are far from the reach of modern-day scientific methods² i.e., the digitally divided world in itself might not provide an ease to the scientific development incumbents to reach various places with the same solution. Thus, to ensure contextual understanding and to appropriate scientific methods accordingly, a contagious attention is given to the local, traditional or indigenous practices, so that the development interventions will be informed and affluent while operating for the welfare of both the humans as well as their culture and their landscapes. The incorporation of the indigenous knowledge and scientific knowledge will help various stakeholders to address different issues with most compatible solutions.

¹ Western science refers to the modern scientific knowledge system (MSKS), which is universally legitimized and has overthrown other knowledge systems.

² Science and scientific knowledge are explained in the 5th chapter; the parallel scientific regimes.

Over the recent decades, the frequency of natural disasters has increased. Landscapes of several countries, such as Pakistan, India, Bangladesh, China and many others have been increasingly vulnerable to the menaces of natural disasters (Rehman & Khan, 2013). Areas which dwell near or under the mountainous regions like Himalayas and Hindukush are in a geographical compulsion to face the hazardous natural disasters. Dwellings like Chitral have a complex formation of the mountains in various directions, which have occupied 3/4th of the lands, with enormous variations in rainfall and temperature (Hafeez et al., 2019). The region has highest tendencies of glacial outburst and unusual lake development with growing land landslide areas. Containing an inconsistent texture of surface³, which makes it highly vulnerable to residual swift and debris flow with rainfall and slushy grounds (Uddin et al., 2019). The vast ranges across the arena vary in terms of the weather and agriculture, which indicates the prospects of variations in the vulnerabilities and challenges of the settlements amidst the highly elevate mountains. The pitfall increases when amidst the rocks there are chances of being hit by a high magnitude earthquake. In line with Hindukush, the Hindu Raj⁴ ranges are known for potential threats; consisting of red zones declared by various intervening organizations like GLOF and AKAH, for these ranges are nesting the volcanic roots deep down beneath the mighty rocks. This makes the area and its inhabitants susceptible to concurrently occurring catastrophes. Although these dilemmatic situations have become a part of the natural and social spheres, yet the region continues to cultivate rich culture with elements of conflict resolution and embracing traditions of unity with the environment, which vary in nature across various settlement in the arena but with functional unity. The land inhabits a variety of indigenous practices, which have been in use since the formation of earliest settlements in the area (Ishaq & Ghilzai, 2020). The advent of technology and modern techniques are recent phenomenon in the region. Back then it was the indigenous knowledge, encompassing regional dwellings and their practices for managing natural disasters prone conditions. Though there may be variety of knowledge-based practices for various types of natural disasters, but natural disasters like floods and earthquakes have been widely evident and prolonged. Thus, the knowledge practitioners have diversified

³ The strain and strain behaviors of sand and soil of the area have been discussed in the literature.

⁴ The ranges which are elevated in between the Hindukush and Karakoram Ranges.

local or traditional practices for reducing risks posed by natural disasters like floods and earthquakes.

Hence, the study is conducted to delve and document the indigenous knowledge based traditional practices which are used to manage the risks posed by natural disasters such as floods and earthquake. And it will also investigate the gap between the scientific and the traditional practices for considering their incorporation at policy and decision-making level.

1.1. Statement of the problem

Natural disasters are inevitable and have been long occurring since the history of humankind. It is not possible to wipeout the natural disasters from the prevailing ecological order and of the world. Humans as rational actors have been actively involved in the process of this never-ending scrutiny of themselves and the world around them. Including the relationships among themselves and with the discursive world around them. These prolonged observations are added up with certain preset and learnt actions, which guide them in many ways to respond to the rising contentions and transformations around them. In essence, the learned lessons and gained experiences are brought into practice to resolve conflicts, manage resources and to propose counter resolutions for the undesirable events; resulting into the knowledge-based approaches to mitigate the prospects of hazardous events. These lessons, experiences and practices cumulatively form the knowledge system, a system that is influenced by the traditions of the human settlements and by the context of the topographical regions in which they prevail.

The products of local wisdom⁵ i.e., traditional knowledge-based practices are timely repeated at specific events or occasions and well-kept through oral traditions, rituals and actions, which are transferred/repeated over the generations especially in the traditional

⁵ Readily interchangeable with IKS.

rural settlements. They are significantly relevant in the context they win through, yet in the wake of global modernity and technical advancements, the indigenous practices to cope with unwanted events like natural disasters, have been ignored. Their abandonment has tended to leave a gap between the understandings of the people from traditional/rural setups, and the fortuitous world around them. Not preserving the role of proponents and the rudiments of the indigenous knowledge system indicates a complete turn over in the essence of the cultural knowledge, and puts an end to the local practices which were adhered by generations over generation.

This study ascertains and addresses the local/traditional practices which are used to cope with the hazardous natural disasters like Floods and earthquake in particular. And it aims to document the local wisdom or indigenous knowledge-based practice for disaster risk mitigation i.e., indigenous ways of mitigations, preparedness, response and recovery, so that they are preserved and looked upon when understanding the context of the prevalence of natural disasters and the vulnerabilities which locals observe. Identification of such traditions of unity⁶ with the environment will increase the feasibility of integrating modern methods of disaster risks management with the local practices that have been the primordial to manage the risks and hazards of natural disasters.

1.2. Research questions and research objectives

The study primarily addresses the following questions:

- 1) How do the locals cognize and behold natural disasters, particularly floods and earthquake?
- 2) Are there any local or traditional practices to manage the risks of natural disasters like floods and earthquake?
- 3) What is the utility of indigenous/traditional knowledge for locals to manage the natural disaster risks?

⁶ Practices which we have been transmitted over generation to live in harmony with the nature.

This study explores the particular uncharted indigenous practices for managing natural disasters like floods and earthquake. It unveils the unmapped local practices which are used as coping mechanism to get prepared, give response, mitigate and offer recovery to the risks of natural disasters like floods and earthquake. While the specific objectives are:

- Understanding the local knowledge on the exposure and vulnerabilities for natural disaster.
- Exploring the applications and utility of local wisdom for the management of risks induced by floods and earthquakes.
- To address the contemporary relevance of traditional practices along with other methods on natural disasters' risk management in the arena.

1.3. Significance of the study

This study is conducted in the wake of the growing attention from the global community towards secluded native wisdom, climate changes and disaster risks reduction techniques. The study investigates to discover the indigenous based practices for managing the risks of natural disasters, and it divulges the void between the traditional and modern techniques. This will enhance the development practitioners to know the knowledge and context of the area for development interventions and integrating modern day science into the ancient knowledge system. And it may help preserve the local wisdom in scholar communities, as most of the local knowledge system have been contested for being influenced by the Western and globalized techniques.

This study is comprised of multilayered benefits, varying along the various addressees of the context. It significantly fills the prevailing void in the scholarly literature and will help future researcher with explored knowledge grounds to be carried from and onwards. Other than informing perquisites for the knowledge community, it also suggests speaking measures for the policy makers and development practitioners to intervene with informed methods on the issue under study. Also, it will be of a great help to integrate the local

methods with the modern-day scientific approaches, so that the local knowledge will not be facing an apartheid and will be recognized in the mainstream knowledge sphere.

1.4. Keywords/ Concepts

- I. Disaster Risk Management (DRM): DRM entails the cyclic coping mechanism to the prospects and menaces of the disasters i.e., the strategies of mitigation, preparedness, response and recovery offered to manage the risks posed by disasters, (Khalid, Hassan, Hassan, & Adnan, 2020).
- II. Disaster Risk Reduction (DRR): DRR entails all the informed disaster risk reduction techniques applied before, during and after the disastrous events or catastrophes (Khalid et al., 2020).
- III. Indigenous Knowledge system (IKS): Inside indigenous societies, the IKS comprises of knowledge that fashions a system of practices. It is based on prolonged observations and adaption, which are made in the wake of interactive relationships of humans with themselves and with the landscapes they interact with. It is also readily referable to the traditional and local knowledge, embedded into the cultural traditions of a certain region and it is independent of the scientific knowledge. Also readily interchanged with the terms like traditional knowledge, ancestral knowledge, local wisdom and native science (Hernandez, 2020).
- IV. Knowledge Practitioners: The local or indigenous people form a certain cultural region who practice the essentials of indigenous knowledge. It also refers to the dominant groups who control the local wisdom and the keepers of local traditions (Hoppers, 2021).
- V. Local Wisdom: The knowledge and practices which gradually fashion the composition of IKS. Also, it is readily interchangeable with IKS (Riffel, 2020).
- VI. Natural Disasters: Other than human induced disasters, natural disasters are those which are inevitable and occur naturally. Such as the floods and earthquake, which are concerned in the canopy of natural disasters for this study (Khalid et al., 2020).
- VII. Traditional Ecological Knowledge (TEK): Usually a subset of the IKS, which only comprises of traditional knowledge about the ecosystem and the landscapes (Sinthumule & Mashau, 2020).

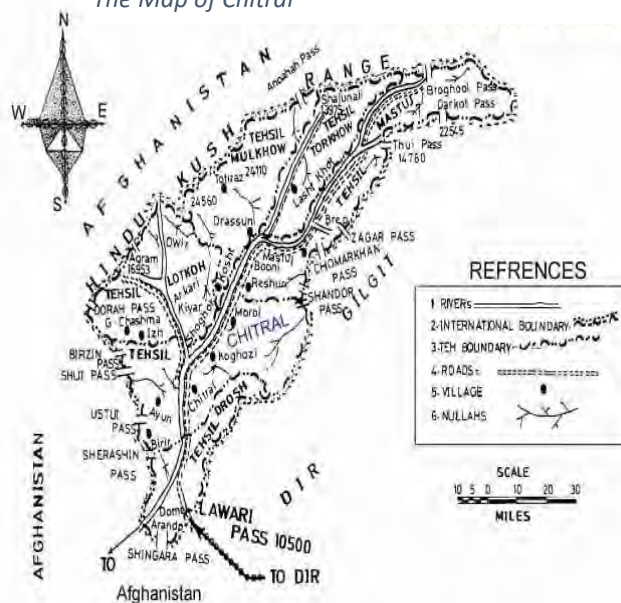
2. The Research

2.1. The Research Site

Chitral is the northernmost region in the Khyber Pakhtunkhwa province of Pakistan, casing an area of 14,850 km². It nests the two renowned mountain ranges, the Hindukush and Hindu Raj which wrap up to 90% of the land and distinct her borders. It portions boundaries with Afghanistan to the North and west, with Gilgit Baltistan to the east, Swat to the South and Parted from Tajikistan by the narrow belt of Wakhan corridor. The population according to the recent 2017 census report is 447,362, out of which 397,568 comprises the rural population, Pakistan Bureau of Statistics (PBS, 2018). It is considered amongst the elevated landscapes of the world, with a swift in elevation from 1000 to 8000 meters. It is packed with 40 peaks that are more than 6100 in height, with Terichmir⁷ as highest peak in the region which is elevated up to 7,726 meters. The forests share 4.8% of the land, whereas the mountains and glaciers cap the 76% of the total area, and it dwells the genesis of the river Kabul

Figure 1

The Map of Chitral



which initially runs from the glacial residues of Borghil Chitral. Before 2018 it was under one district administration with two subdivisions, but later the region has been separated into two districts, upper and lower respectively, with upper Chitral constituting 8,392 km² of the erstwhile total area. As shown in the Figure 1, the Tehsil boundaries

which separate Mulkhow and Mestuj from Tehsil Lotkoh and Chitral constitute the boundaries of new districts' division. The regions are linked to the other regions of Pakistan through

Note. Map of Chitral with two adjacent districts, where the lower boundaries of Tehsil Mestuj and Tehsil Mulkhow separate the upper district from the Lower, (Paki Mag, 2022).

new districts' division. The regions are linked to the other regions of Pakistan through

⁷ Highest mountain of Hindukush ranges

two major road ways, which are the Lawari tunnel pass connecting lower district and Shandur Pass at upper district (Nusser et al., 2002; Cutheral, 2011; Uddin, 2019). The majority of the population is of the Khow⁸ people, who are considered the native dwellers of the region, with Khowar⁹ as their spoken language. Khowar is believed to be an extension from the Dardic family of languages, and besides Khowar there are up to 13 other spoken languages that prevail in the area and out of which a few are innate to the area, such as Arandui, Kalashwar and Katviri etc. Approximately a single culture encompasses majority of the settlements in the area, with shared ancient practices and beliefs, most of which are influenced by the religion. According to the census conducted in 2017, upper Chitral as a separate district inhabited 169,297 people and out of which 48.43% were men and 51.56 were women, and out of which 99.09% people are Dardi Kho speakers. This makes the lingual group a unique culture adherer, without any lingua franca, unlike the lower district that has variety of languages. Yet there are nouns and words, which are borrowed from other languages, as the Khow dialect and it's uses have been subjugated by other established literatures, Bureau Report, (2018, November 21). Upper Chitral gets the status of separate district. The people of the region have their own unique communal assistive supporting organizations and indigenously crafted assistive and reciprocal social relationships which fashion the sphere of the practiced culture (Marsden, 2010). Since the canopies of vertical mountains have great variations in weathers and vegetation, the area across various spaces faces distinctive environments and with varied circumstances. The existing topography has made the region extremely vulnerable to disaster, particularly natural disasters like floods and earthquakes. The people in continuous interaction to the variations and offerings of the landscape have adapted to environment with techniques to minimal losses and anticipatory approaches. Accordingly, the people of the region have crafted an indigenous knowledge system that has been effective ever since the people started interacting with regional landscapes. Hence, study is limited to district Upper Chitral as research arena, all the respondents and data of the study will be taken from upper district which mainly comprises of rural dwellers.

⁸ An indigenous tribe associated with the Indo-Aryan Lingual group i.e., speaking Dardic language.

⁹ *Khowar* as term is composition two words, *Khow* refers to the tribe and *war* means language, so *Khowar* means the language spoken by *Khow* people.

2.2. The Respondents

On account of the nature of this research, there might have been ambiguities or over generalizations if the data were to be taken from the respondents of a single dwelling or village, for the reason that the type of natural disasters and the nature of vulnerabilities may vary spatially. Hence, I have appropriated purposive sampling, opportunistic sampling and convenient sampling¹⁰ to attain data from the diversity. I have not solely relied on purposive sampling to exclusively employ for generalizations and proposition of newly emerging concepts but it has helped in identifying the appropriate cases and contexts to be considered and cover all the potential referrals. While doing this ethnography to record and document the potential respondents who can address the research questions with the essential field knowledge, I intended employ an opportunistic sampling technique to cover the respondents I met during the field. Moreover, to enrich the data, I considered and took on the convenient sampling to assess the accessible respondents. The reason for employing multiple sampling technique is to cover all kind of indigenous knowledge available in the field i.e., to cover the individual, distributed and communal knowledge on the subject simultaneously. Along with the observatory and participatory techniques for data collection, I have interviewed and cross examined 36 key informants, who were selected on the basis of above-mentioned sampling techniques. Amongst the respondents, participants selected and observed through these sampling techniques were both men and women in their youth, adulthood and late adulthood¹¹, particularly the social groups or practitioners who have been in practice since their formative years. The youth I have assessed were all literates and were in their formative years of career, where the respondents in their adulthood were not all literate, and the majority of them were retired soldiers. To get a rich data as per the requirements of attaining data on indigenous knowledge, directed by the literature I had documented the

¹⁰ The sampling techniques that this study has adhered to, and their operational definitions are explained in the section for data collection.

¹¹ Table 1 categorically explains the age groups in which the youth, adulthood and late adulthood are classified.

responses of respondents from the age group of late adulthood¹², these are the people who were not literates and have spent their lives in conducting the daily life chores at their homes i.e., farming, grazing cattle and gathering woods. I also followed the techniques for sample size and saturation i.e., the data indicated the saturation point after covering 18 respondents and the rest were cross examined to reinforce and check the reliability of the data attained, and thus I determined the sample size at 18 numbers of respondents.

Table 1

Demographic distribution of respondents

Age Groups	Male	Female	Total
Late Adulthood	11	7	18
Adults	6	4	10
Youth	4	4	8
Total	21	15	36

Note. This table demonstrates the number of respondents with their distinctive sex and age groups they are affiliated with. Among the 36 respondents 11 male and 7 females were in their late adulthood which is 60 years and above, 6 males and 4 females were adults starting from 30 and above up to 60, where 4 males and 4 females were taken from youth with the ages starting from 24 up to 30.

2.3. The research processes

This time when I went to Upper Chitral, I was not on vacations, neither for any escape from busy life in the city, rather I had a responsibility to conduct field work for the data essentials of my research. Although the nature of the field was overt and I being a full member of the community did not feel the need to put more efforts on rapport building, which I had learnt to familiarize myself in field for research to portray the natives as one of them. Yet upon reaching the destination I felt the need of repositioning and building a repute of ethnographer who observes, participates and penetrates the discourse for knowledge and its conveyance. In the pursuit of provisions for this research, I for the very first instance started it from my home; I reached home and after greetings I sat down

¹² Literary discourse reinforces the idea that indigenous practitioners who are in their late ages have sound and consistent perceptions on priori functional knowledge system and adapted knowledge system prevailing in the current time.

next to my mother and told her about my research and the field. By the way she reacted to my quest for attaining on acquiring field knowledge about the local wisdom for containment of natural disaster risks, I came to an instant realization that rapport building is not just a practice of conforming to whom we are looking at but it is a process of delineating our positions as out and insider simultaneously. I for the first time espoused the synergy of emic and etic approaches to record findings for the research. Buni, my home town and the headquarter of district Upper Chitral was the very first field of intervention, for my convenience initially remained in the orbit of my belongings. Given the historical profile of Buni it was very evident that the dwellers or natives have faced floods as challenge for the formative times of the settlement. The interview guide I had prepared became the baseline tool to identify respondents as per my convenience i.e., the guided questions had made me clear about whom should I reach to grasp the data on indigenous knowledge for the study. Also, guided by the local seasonal calendar, I had on field opportunity of scrutinizing the events of floods and glacial unrests. Although I could not manage to inspect the disaster situations of earthquakes on field, but I profoundly managed to participate in participatory mechanisms ascending in the meantime of summer season, which mark the occurrence of floods in the region and I measured the impacts of earthquakes happened in the past with investigating the local coping mechanism offered to manage earthquake risks. I then went to various susceptible villages in the area after gaining information on their historical profiles and seasonal calendar. Reshun, Charun Ovir, Sonoghur, Raman, Chinar, Brep, Meragram no 2, Muxhgol and Khot were the villages where I spent most of my time in participatory engagement and interviewing the key informants, whom I reached out purposively and conveniently. Shown in the figure 1, the arena comprises of three Tehsils Mestuj, Mulkhov and Torkhow correspondingly, at first, I was eager to cover all the villages of these administrative units which are distinctively identifiable by their given topographical settings. After coming across the historical profiles of various villages in the locale I realized the need of generic purposiveness in my methods to portray representative samples, I then selected the mentioned villages which I purposively visited and stayed in for conducting field work.

There are very clear distinctions of social relationships in the region, the horizontal and vertical lines of fraternity categorically assist people in different aspects of life i.e., the region is not much developed with transportation, hoteliers and innkeepers to facilitate outsiders or guests to accommodate their stay at places other than the local residences, the same is also applicable on the locals. For instance, if a person from Reshun intends to go to the villages of other Tehsils or far in the north in a village like Brep then he/she commutes with the acknowledgement that he/she cannot come back to where he or she had left earlier on the same day, and he or she has to accommodate his or her shelter for the night at the reached destination. Just like that bounded by compulsions and for the suitability of time for field intervention wherever I went to, other than my home town I stayed at relatives, connected by means of social relationships like kindred, affinal kins and friends. These social relationships played the trajectory roles in giving me access into the field, got me acquainted with the key informants and facilitated my stays at various venues, providing me a flexible timeframe to be familiar with field of observation and with the data I found.

Personally, I was very intrigued and unhesitant to rediscover the places and people with new focal lenses. This time wherever I went to, I intended to do what they did, after returning from fields I used to think as if I have become one of them. My changing positionality was the aspect I relished and cherished throughout the time spent in and on the field. Participatory observations in emergencies were moments of realization of vulnerabilities and risks the dwellers were prone to, particularly I participated in the evacuation process at one of the villages where a few days earlier a flashflood had passed over with minimal destructions. Yet again, the natives had anticipations pouring rain, hence they were busy evacuating their essentials from their adobes. Overall, I realized there is dire need of researches on the perception, vulnerabilities and the readiness of the natives with respect to their crafted knowledge system so that affective techniques would be identified to enhance the efficacy of disaster risk management system, I was indeed a part of it and I felt honored to have decided to work on this particular issue.

I for several times questioned my positionality during the field and data collecting process. At times I felt like I was questioning myself; as a full member of the overt setting, I was mindful about what have I learned as native, how for instance I have not been informed about the prevailing knowledge in the field and at other times I was considerably quizzing the natives as if I am exposed to setting for the first time. Throughout the field my primary focus remained participatory observation, I observed, quizzed, and participated in the contexts as per the nature of knowledge I sought to attain. The whole process of data collection, making notes and noting down the impressions have subjective predispositions, hence to objectify the nuances of local wisdom I continually detached and attached myself from the data collected in the field. Usually in Anthropological researches the data interpretations are contested, for the methods of interpretation an ethnographer adopts affect the portrayal of natives to a certain degree. To mitigate the partialities in interpretations I have used intelligent verbatims to fit in the context for coding the data accurately, thus the themes generated are reflections of the context sensitivity of data, respondents' reactive expressions and participatory observations. For that matter I adopted confessional and impressionist writing styles to thickly describe the natives in a frame. As a researcher with a topic of my own interest I had my predisposed reasons for certain causal activities in the field, although I did not interrupt the native with what I had in my mind but sometimes I had my own presuppositions and judgements for certain findings. Therefore, to make the thick description free of researcher's biases, and to not judge the natives I have described my shocks, expectations and assumptions in the description. The themes generated are composed of discourse from the field and participatory observation of action-oriented activities present in the field. For the sake of contextual generalization and analysis of data as per the nature of data, the findings and their investigation run sided by side so that the data is not delineated, negated, or over generalized while portraying the natives. I believe the confessional and impressionist style of description give the interpretations an edge of maximal objectivity while verifying the real-life situations and cognizance of natives.

In a nutshell, during the whole process I have changed my positions as insider and outsider for several times to collect unaffected data for the research. The structure of discourse is often influenced by the anthropological lenses I have been looking through and the analysis for a certain limit are drawn in the light of the influence of data on my social perspectives. Thus, in the pursuit of addressing the preset research questions I have adhered to the synergy of emic and etic perspectives and have complied with them simultaneously to portray the natives and their wisdom to cope with the risks of natural disasters.

2.4. Data collection

On account of the nature of this research, it was not possible collect data from a single dwelling and make it universal for generalization, and also it was not possible to attain on field data from a single sampling technique. As the type of natural disasters and the nature of vulnerabilities vary spatially, hence to record maximal effective and reliable data I used convenient sampling and purposive sampling methods.

Convenient sampling in researches refers to the method employed in non-probability sampling of population, where the representative population is already known or at the convenience of the researcher (Qureshi, 2018). The nearby respondents for the research are always helpful in time management and do not require extra lengths to go for data collection purpose. Also, the sudden and easily accessible events or activities to observe and participate in are the gems on the field which can profoundly enrich the data with essential variations and reinforcements. I started to check the data collection process with a preliminary guide using convenient sampling. When I was all set to go on field, on the very first instance I investigated the nears around me at my own village. Purposively I had arranged minutes of conversation with an elderly person in the community, while on my way to the respondent's place an adult dweller got accompanied and I started an unstructured investigation making him the random handy respondent for my research. Just like that I had come across several potential respondents for the attainment of

thematic data, especially on my way to one of the villages in the locale I saw a group of people busy in repairing an irrigation channel razed off by flashflood, I participated in that random activity and took out the essentials to document in the findings for generalization. The very purpose of employing convenient sampling was to enrich and cross check the data attained and present in the field.

Purposive sampling is a non-probability sampling technique, which is concerned with the decisions of a researcher to consider certain population or respondents for a study, and also a researcher ruling to participate in a certain prejudged or posited event or activity. It is employed for better suitability of respondents and activities with the aims and objectives of the research (Campbell et al., 2020). The generic purposive sampling is purposively conducted to record the responses and observations coming from a population with specific characteristic and events of a particular nature, which are judged by the researcher. Evident by the thorough literature I learnt that the knowledge in indigenous settings is mainly controlled and regulated by the dominant dignitaries and practitioners of knowledge. Thus, to attain data from people in their late adulthood and mainstream practitioners of indigenous knowledge I used purposive sampling cum generic purposive sampling to record data findings. Also, I participated in and observed activities which were by nature integral to the local wisdom and related to natural disaster risks management. The majority of the responses were recorded by means of purposive sampling, I have participated in local activities to curb the risks of natural disasters such as flood, and purposively I recorded responses of key informants on the subject of concern for the current study.

The convenient and purposive sampling methods were exclusively adopted to collect data, together they were employed to collect rich data for thick description and to determine the sample size saturation for data collection. Participants or samples identified through these techniques were both men and women of different age groups. Given by the nature of study I purposively intended to investigate elderly people as population representatives, for the elderly members of the community have observed decades of

social change and have been actively participating in inland knowledge spheres ever since their formative years.

In ethnographies the role of ethnographer sets the primary impression while pursuing potential data keepers and observing the activities. To well keep the standards of ethnographic approach I played the role of an active multi positioned ethnographer to attain vivid information on the subject. Meanwhile the process I observed and investigated the locals, and participated in case activities as participatory member. I was part of on field core activities in pursuit of addressing the research problem, yet I relied on observations, interviews and field notes as great data sources for the research. The primary first-hand data was collected from the in-depth interviews of key informants and focused group discussions of the participants who were taken as samples through the employed sampling techniques. The data collection instruments were semi-structured interviews and unstructured conversations; I adopted qualitative interviewing method to conduct the semi-structured interviews of key informants and adhered to unstructured conversational for group discussions, and priori recognized individuals. Moreover, during the data collection process I significantly counted on field notes as main source data, for the field notes are the intimate data sources from the field.

2.5. Data analysis

The data coming from participant observation and from on field intervention were recorded in field notes. As an active participant observer and ethnographer, I experienced firsthand knowledge of the happening and knowledge present in the field, so when analyzing the altogether data, I already had familiarized with the context and the data I collected throughout the research.

Other than field notes on the setting of the field and participant observation the interrogation of key informants was the major source of the primary data for the research.

For the sake of clarity, unbiasedness and accuracy of depiction I chose to go with intelligent verbatim transcription of the responses recorded from the key informants. Intelligent verbatims are such that they are summarizing, free of third party's distortions and true depiction of the meaningful discourse intended by the respondents (Eppich, 2019). I further went to refine the data with thematic coding of the transcription to generate themes for analysis. In thematic coding usually the common themes, ideas and linkages are identified to make them basis for categorical indexes to generate themes for analysis (Williams & Moser, 2019). By means of thematic coding I was able to index the text of relevant verbatims, notes and memoirs into major themes and sub themes to address the research questions and to portray the natives.

Throughout the findings and their analysis, I have relied on thematic analysis to analyze and covert the index into a representative thick description. Thematic analysis is an influential and elastic tool in qualitative researches, especially in anthropological researches it has been promising, for in ethnographies often times the hermeneutical grounds of an ethnographers are contested which are to an extent made reliable through thematic analysis (Fugard & Potts, 2019). All themes generated in this study are in the light of the principles and rules of thematic analysis, where to my own reflexivity and to control biases in ethnographic writing I have intended to present the thematic data through impressions and confessional narration deciphered into thick description.

3. Literature Review

3.1. Overview

The indigenous knowledge-based practices and the natural disasters have a diversified attention from the scholar and knowledge community. People susceptible to disasters, and development incumbents are already indulged in the pursuit for preparedness and response to mitigate the number of devastations caused by the natural disasters. This coping mechanism does not rely only on one side knowledge but it considers all of the opportunities to alleviate the chances of situational poverty (Baumwoll, 2008). Other than the modern-day science, the indigenous knowledge system, which is also referred as the traditional or local knowledge system is not universal, and lacks many of the general scientific tools/scales for appropriating first-hand knowledge. Yet it comprises of essential stand-points on the ecological, phenological and seasonal knowledge of the changing world and its landscapes. These knowledge trajectories of the indigenous knowledge system emerge gradually, with a significant role, status and position for the knowledge practitioners of any local community. They are based on the primordial observations of the discursive world, its progressions and their relationship over the passing course of time (Syahputra, 2019). The contemporary post-traditional world has advanced with modern day techniques to mitigate crisis, and it is equipped with techno efficient procedures to cope with the crisis situations. Yet there are ancient traditions, based on prolonged observations, locally acquired wisdom, or traditional knowledge systems which offer a great variety of sustainable indigenous practices. Such knowledge crafts, which despite the global modernity and technological advancements are still functional and need a considerate attention to preserve them. Pakistan being geographically vulnerable to the natural disasters observes multiplicity of local methods to contain the hazards of natural disasters timely. Following traditional tribalism and being resistant to the modern-day interventions, the local practices from times immemorial are still incremented, improvised and utilized to mitigate the menaces of natural disaster (Akhter et al., 2017; Ahmed et al., 2021).

3.2. Indigenous knowledge system and disaster risk management

3.2.1. The model of Indigenous Knowledge System

People from all around the world have distinctive understandings of the discursive world around them, they make use of the senses they possess, they start knowing and perceiving, every knowledge gained by them, fashions how they live the way they live. Profoundly, the environmental landscapes and the immediate material conditions play a vital role in setting the offshoots for systematic local wisdom, or the indigenous knowledge system. This setting entails a persistent process of scrutiny; prevailed and continued with the passing course of time, yet becoming integral to the livelihood practices. These practices are repeated, made figurative and scheduled, for they are legitimized as per their utility and they are rooted in the culture they run-through. The lessons learned and experiences earned through these practices tend to shape and determine the relationship among the practitioners themselves, and with the non-human world they interact with. The keepers of traditions transmit the knowledge in form of narratives, ritualistic markers and repetitive rehearses, offering them to the next generations with cultural coherency (Vansina, 1985). These prolonged practices, experiences, relations and observations are referred to as the indigenous knowledge systems, which consume the hearth of a cultured society.

The indigenous knowledge based traditional practices are visible and evident by the relics, artifacts, ritual markers, landscape modifications, belief system and the socio-environmental interactions. The localized knowledge contains significant information to contextualize the empirical or scientific practices with semantic construction of the traditional knowledge that has had taken a systematic position in a certain society, under certain circumstances. Hence the indigenous or traditional knowledge system is believed to be the network of awareness, philosophies and traditions that are well-kept-up, transferred and contextualized in terms of the indigenous associations with culture and landscape (Baumwoll 2008; Bruchac, 2014).

3.2.2. Understanding natural disasters

Disasters are understood as abrupt hazardous events that by any mean tend to disrupt the prevailing state of comfort or the status quo, with losses in possessions, degrading mental health and even posing threats to human lives. According to the Merriam Webster, the collegiate definition of disaster is, “a sudden calamitous event bringing great damage, loss, or destruction” (Merriam Webster, n.l.d.). Be it the human induced disasters or the naturally occurred catastrophes, they are only measured in terms of their intensity to damage or the magnitude they have had hit with, causing a great variety of harms. Disasters thwart development practices, and impede the growth in human societies, ranging from material losses to emotional sufferings and debasing the harmony of the natural and social worlds, (Ahmad et al., 2015).

(The Interco-operation Pakistan Annual Report 2012) revealed that disasters promptly impede the usual state of development activities, when happen. A fair amount of people is exposed to natural disasters in the lesser developed countries, resulting in more causalities and increasing the death tolls. The local inhabitant in disaster prone areas of the low human developed countries are nearly blind of the situations they are in, and they had dealt with; floods, landslides, rock falls, thunderbolts and draughts etc. are the inevitable crisis they least know about how to deal with appropriately. Although the people in risks are less equipped with the essentials to mitigate disasters risks, yet they have their own understanding and response towards them, based on the knowledge that has been practiced over the time and generations, and observations which have gradually made it to the livelihood practices for conditional surviving (UNDP 2004).

3.2.3. Semiotic construction of indigenous knowledge-based practices

The culture that has ran through generations and which has been passed to us is a legacy of symbolic representations, at times of events and others of the objects, which happen and exist around us (Mathur, 2017). The culture stimulates assigning of different meanings to the content and processes that we offer as response to the interactive world

around us. For an instance, we have inherited the behavior of mourning at times of great demise, this is not a knowledge which we have inherited genetically but it is learned and shared, as the culture is understood or transmitted (Horton & Hunt, 1968). Tylor has also proposed a more familiar understanding of the culture, whereas, he believed culture to be the knowledge, ideas, practices and capabilities acquired by people as the members of their society(s). So, our understanding of the culture, knowledge and behavior is solely dependent on the semiotic mediators, for cognizing and practicing them (Hallinger, 1998).

The local wisdom or the folk knowledge relies on the persistent scrutiny, interaction and repeated reactions from the happenings, which occur in the environment where people inhabit (Ellen & Harris, 2000). People of certain settlements have varieties of environmental knowledge, based on their interaction with the landscape they are surrounded with. They read the intentions of the landscapes and the nature through contends they have gone through, and with the knowledge they have acquired over the time (Lewis, 2000). In essence, a person from peasant background might anticipate the yield from crops of the commenced year by measuring the amount of rainfall that has fallen and the indicated measure that is yet to come (Ellen et al., 2000). There is not a one-way route through which the indigenous knowledge is transmitted or understood, it is with any doubt contextual and multifaceted. The knowledge which has been embedded into different criterion and categorical events or objects encompass the society of similar cultural practitioners with a degree of similarity in the understandings/meanings of their presence and prevalence. So, people of alike culture have identical semiotic relevance of the traditional cultural expressions, offered by their culture. Traditional cultural expression is a catchphrase termed by the World Intellectual Property Organization, and it speaks of the local knowledge that has been transmitted over the generations, through stories, rituals, practices and ceremonies etc. (Janke, 2003; Antons, 2009).

The ritual markers are however enriched with symbolic inferences, which are derived from the knowledge which has been observed, practiced and transmitted in a society. The

rituals based on the indigenous knowledge are formulated with laws to abide them, so that they make sense of what is happening and how it has been done. For an instance, the rites of birth, marriage and death of people with a distinctive culture might not be done or appreciated if they do not undergo or comply with the ritualistic and customary laws of that culture (Hunter, 2002). Negi conducted a study to analyze the reciprocal relationship between the habitats and cultures of the settlements from Uttarakhand, Central Himalaya and found a deep link of their religion with the ecosystem they were interacting with. Using the traditional knowledge-based systems methodology, the study found that the inherent taboos of the community related to the natural resources and their preservation were followed by rules and practices. Those rules and practices were derived from the link between their religion and the natural topography, they offered the forests, water resources and landscapes etc. to a supreme deity, with the pledge to sustain them and without exploiting them. Their ritualistic attitudes actually helped in mitigation of environmental crisis and degradation, in the wake of the regulated coercions (Negi, 2010). An indigenously generated knowledge might take many forms over various contextual diffusion, but the essence of wisdom in it remains protected. Ayahuasca, the Amazonian indigenous drink, which was initially originated and utilized in the Amazonian region for spiritual healing, found a way out beyond the boundaries. It was adopted and appropriated accordingly but the essence of the ritualistic value of the brew remains the same (Tupper, 2009). There are many varieties of the semantic entities in every culture and among every indigenous people, which in their respective ways manage conditions to cope with emergencies, needs, conflicts and crisis.

3.2.4. Synergy of scientific perspectives and indigenous knowledge

Acquisition of knowledge and attainment of information does not solely rely on the scientific endeavors, but there are other non-scientific systems of knowledge. The world has already entered into the age of information and rapid globalization, where it has been a challenging task to delineate the information from misinformation (Crovini et al., 2018). Such has been the dilemma of the recognition of knowledge-based systems that are other than the scientific system, and which are prejudiced and misjudged for their

nature and methods of formulating the knowledge structure. Not necessarily a system based on science or western influenced system can be adequate to any context, in any given time. The trajectories of knowledge systems vary across various societies and various times. In research conducted, (Boven et al., 2002) have supported the argument that the formal/scientific knowledge and the western-based knowledge systems are a few amongst many. There are other non-formal knowledge systems and non-western indigenous knowledge structures, which have won through centuries and decades, and are still relevant.

Ellen and Harris have argued that the local wisdom comprises of information, philosophical archetypes and lawful conveniences, which are utilized and arranged in ways which provide a contextual ease to cope with the undesired situations and to meet the desired needs. Whereas, these cultural forms of knowledge are chunked and integrated into the formal ways of knowledge i.e., the scientific knowledge. Also, development occupants as knowledge making institutions, such as the NGOs, while operating in any indigenous community or rural settlement, they have decontextualized and fragmented the indigenous or traditional knowledge to put them into Western and scientific models for swift solutions and to get accredited (Ellen & Harris, 2000).

The perspectives and operations which endorse a top-down approach in terms of the operating in an indigenous community might pose threats to the agency of the local cultural practitioners, whose agentic roles are based on the indigenous knowledge system. Such gross involvements have negated the utility of the traditional practices and have deplored the position of the indigenous knowledge, which starts from the grass root level or which is more of a bottom-up approach. The scientific ways of coping to emergency situations are ought to approach from the bottom to the top, without leaving any essential knowledge and practice in a void. Fischer while exploring the relationship of culture, knowledge and society in terms of change, has argued that not all scientific knowledge is apart from the cultural knowledge and not always they are the same as the doctrinal

science. For the indigenous knowledge is also at time anticipatory and forecasts a situation, as referred to the idea of prehension by Ellen (Fischer, 2006).

Be it any aspect of the indigenous knowledge, they are delineated from the non-local ways by some of the popular characteristics observed by the indigenous knowledge system. Those features are widely accepted by the knowledge practitioners, while studying and observing the local wisdom and indigenous ways of understanding objects or events. The indigenous knowledge is local, orally transmitted, metaphorical, generalized, reoccurring, and traditional. Which are shared and dominated by particular knowledge group, making it functional and holistic as cultured. The science on the other hand greatly relies on experiments, surveys, sampling, empirical evidences, media propaganda and literary community to establish facts for practice and knowledge (Ellen et al., 2000). Thus, the integration of different ontological and epistemological grounds of the multifaceted domains of knowledge give rise to challenges, which pertain the methods of collection, interpretation, access, preservation and the intellectual property rights. Yet certainly adequate while calculating risks and preparing for them with all the available resources, including the variety of knowledge (Nguluble, 2002). Studies have found that integrating indigenous knowledge with modern day operations of science has become fruitful and efficient than ever. Such as the integration of local wisdom into academic curriculum has benefited the scholars in many ways i.e., it has been proven promising for efficient learning techniques and for the perseveration of the knowledge on the other hand (Hewson, 2015). Similarly, the indigenous knowledge plays a vital role in mapping and directing the scientific approaches into the context of disaster risk mitigation (Mwaura, 2008).

Though the IK has been underrated and clichéd as primitive, neo-primitive and outdated, yet it has been proven that the indigenous knowledge contributes plenty of discourse on mitigating the disaster risks, with appropriating the guidelines to pave ways for the science to jump in with handy knowledge of the situation, and to be acted upon (Dube & Munsaka, 2018). The examples form the study conducted in the coastal settlements of

Bangladesh would be significant to quote the implication of the integration of science and local knowledge. Haque found that the people of coastal Bangladesh had nurtured their ecological and environmental knowledge through myths, beliefs and traditions, which were anticipatory and adequate to the situations they were facing, and had to face. The science only tested the capacity and productiveness of their landscapes and suggested quick fixes and remedies to the malfunctioning aspects of the traditional approaches. The people then did not overthrow the knowledge they dwelled, but appropriated it according to the scientific discourse and findings to achieve the peak of compatible interventions to manage and reduce disaster risks. For an instance, the people knew that coastal plantations were effective to avoid risks of disasters like coastal floods, but the science provided them the information on what marine plants might be resilient to high magnitude destructions and how to nurture them (Haque, 2019). So, the indigenous knowledge and science go hand by hand, but with amendments and fixes on either side of the knowledge tenets, to appropriate their integrated approach to the context of their intervention.

3.2.5. Disaster risks and primordial fidelity of IKS

Evident by the data information on the desirable climatic transitions, it is known that the risks of natural disasters are also escalating along with human induced adversities. The global communities are in the pursuit of mitigating the risks posed by disasters, the quest to prevent, prepare and respond to the disasters have been advanced through recent scientific inventions and innovations such as the technological surveillance and cautionary systems. Despite the rapid growing technologies and advanced reconnaissance systems, the techno efficient science has not been able to understand the magnitude and onsets of disasters correctly and contextually. This dilemma has invited the global incumbents to reduce disaster risks to rethink on the matter and integrate the local knowledge on the subject to reduce the disasters and their destructive arrival at earliest (Thapa et al., 2015).

The form and expressions of the induced knowledge and the applications of the lessons learned are contextual and multifaceted, they vary along various times and spaces. For an instance the indigenous disaster coping mechanism for coastal areas might not comply with those of the mountainous and dessert areas, for the nature of disasters and the vulnerabilities to them change with topographical changes (Ahmed, 2010). Mangroves are widely known for their capability to mitigate disaster risks in the coastal areas, people who are settled in the wetlands and coastal plains are actively indulged in planting shrubs and nourishing marine plants such as the mangroves and others. Emilia Gates conducted a study on role of mangroves in flood risk reduction in the coastal areas of Sindh Pakistan and agrees to the notion of the multiplicity of traditional knowledge's expression and seconds the idea of forestation of coastal herb and shrubs as affective for mitigating the damages of floods (Gates, 2020).

Similarly, the dessert areas have different indigenous strategies for disaster risk mitigation, such as the water conservation and harvesting strategies to reduce the impacts and effects of droughts through digging wells, storing water and cultivating crops which consume less water are more effective in dry places. (Ahmad et al., 2004) have had identified scheduled cropping, digging underground water reservoirs and building ponds as techniques for the water conservation strategies for drought mitigation in Pakistan. Agreeing to the study conducted and the uniqueness of indigenous practices along with time and space, (Aijaz & Akhter, 2020) have had seconded the techniques of water conservation for drought mitigation. They stated loyalty of the idea for building dams for water access as ancient and efficient to cope with the severity of droughts in the dry plains and dessert areas.

A case study on "Simeulue" is evident that how the integration of their indigenous knowledge with scientific advancements had successfully mitigated the destruction of the adverse event and how a proper response was offered to rehabilitate the pre-existing order of the victimized community. The story of "Smong" by the "Simeulue", is believed to provide information on tsunami was considered to guide the environmental ethics

alongside science, and the results were highly appreciated by the disaster risk reducing incumbents as efficient and up to the mark (Baumwoll, 2008).

A retrospective study was conducted to explore the earthquake posed individual harms in the dwellings of Hindu Kush region, it was found that in sudden hazardous situations like earthquake there were higher chances to get body injuries and even serious casualties. Considerably, there were higher number of wounded people spotted, who had been injured in the earthquake. Topographical regions like these make a nested loop; being settled in the gigantic rocks and meadows high up in the mountains make the place highly susceptible of natural disasters and readily prone to huge damages and losses (Ahmad et al., 2015; Rafiq & Blaschke 2012).

Areas far from the reach of expressive technical modernity lack the techno essentials and modern-day method to cope with the alarming situations, emergencies and hazards. Chitral due to its geographic origin is more vulnerable to disasters, particularly to the natural disasters, and usually remains cut off from the rest of the outside places. The drowned roads, the interrupted functions of service providers like hydropower stations and telecommunications make it more difficult to apply or get into the advanced approaches for disaster mitigation. Despite all the hurdles the locals in many of their own ways get prepared and give response to the disasters (Qadir et al., 2016). Be it the evacuation of their inhabiting places and storing resources to continue carrying out daily life chores, the communities have their own unique local strategies to escape the gravity of destruction at times of natural disasters.

3.2.6. Methodological interventions and interpolation for the study

The disaster risk management entails a cyclic process to cope with the prospects and menaces of the disasters. It is widely known that the disaster risk management is figurative with cyclic steps like prevention, mitigation, preparedness, response and recovery. Various scholars and development champions have adopted these strategies to

introduce disaster management mechanism and have set these as standards to explore the prevailing local emergency management practices (Guzman, 2003). Author while researching on the disaster risk management have agreed to the systematic model of risk management. Though many vary in their opinions to celebrate and adopt the integrated model for natural disaster risk management, yet trajectories such as mitigation, preparedness, response and recovery have been the steps which are accepted widely (Zhang et al., 2006). Studies are evident that areas which have overcome their vulnerabilities to the disaster risks have been in complete compliance to the sequential disaster risk management strategies (Poljansek et al., 2017). Hence, effective disaster risk management is believed to be an integrated system of these steps, and any system that undergoes this cycle is believed to be compatible for facing the disaster smashes effectively (Etinay et al., 2018; Hosseini & Izadkhah, 2020).

International organizations, such as the United Nations Development Program through backing research statistics, placed its opinion on the severity of the disaster onsets in the near future and ever after. The global statistics on disasters illustrated that nearly 70% of the human settlements are vulnerable to disaster destructions, as more of the human dwellings are either settled in the coastal areas or in high peaks, making them vulnerable to sudden destructions, particularly by the natural disasters (UNDP, 2007). Chitral also shares the same topographical vulnerabilities, settled among peaks with thick and heavy glaciers, landscapes with destructive avalanches and landslides, flash floods and glacial floods, vulnerable to high magnitude earthquake hits, droughts and thunderbolts etc. has the higher chance of risks and destructions by natural disasters. Moreover, casualties and death tolls have been recorded that are caused by disasters, which could have been reduced or controlled if timely preparedness and controlling measures were ensured (Khan & Ullah, 2016; Ashaq & Ullah 2016). There is a need to readdress the mechanisms for disaster risks reduction, with the contextual understanding of the vulnerabilities of the place by assessing the perceptions and traditional knowledge of the locals, and integrating them to the modern-day scientific mechanism to cope with the disasters at

earliest and suitably. Also documenting the local wisdom to preserve the indigenous knowledge could help policy measures to look upon the place keenly and feasibly.

Ethnographies tend to be qualitative in nature, with in depth analysis of the real-life situations and making unbiased drafts of what the natives actually feel and know about the subject matter. Plenty of case studies have been conducted in the arena with qualitative dialogues and interviewing methods to unveil the phenomenal disasters and community approaches towards mitigating them (Griffin, 2017). (Mehmood et al., 2016) had relied on the primary and secondary data sources as data acquisition for the assessment of disaster led destructions in Northern Pakistan. The study entailed structured interviews and focus grouped discussions to analyze the experiences of the local victims of the disaster. Local knowledge is usually cornered by the dominant groups of the place, thus most of the researches conducted have had purposively documented the knowledge conveyed by the dominating entities (Smith 2012; Thapa et al., 2015). Studies also revealed that the indigenous knowledge were documented in the forms of traditional ecological knowledge and oral traditions, through interviews and selective group discussions (Burchac, 2014). Since it is difficult to delineate the information and misinformation and at times the data is also not up to the mark to meet the research questions, the semi structured interviews for data collection in the case of ethnographies are widely accepted as best possible data collection method (Atherton et al., 2018). The research design to investigate indigenous knowledge and practices on disaster mitigation usually followed purposive sampling to get accurate data from the people who had direct involvement in the event, to intact the appropriate data collection (Makondo & Thomas 2018; Nyumba et al., 2018).

3.2.7. Gap in the literature

The threats of natural disasters have been increasing eventually, and the number of compensations is also growing with the inevitable variations in the climatic change. Community dwellings from various parts of the country have their own geographical

vulnerabilities. Disasters onset like seasonal flashfloods, glacial outburst, avalanches, rock falls/landslides, earthquake and drought etc. have been continuously hitting people from different geographical. But people as adaptive beings have had faced and coped with them through various adaptive techniques, since the time of their occurrence. Such dwellings with their traditional practices and local wisdom have usually been parted away from the focal concern of scholars, for they are non-western in nature as excused. (Komino, 2008; Mercer et al., 2009; Hiwasaki et al., 2014).

Such is the case of Upper Chitral that is a far-flung north-western region of Pakistan. Settled amidst the harsh climatic mountainous ranges of Hindu Kush and Hinduraj, which are already in cyclic transformation. Being a cutoff region from the rest of the country in the history and up till the recent decade, it has an ancient understanding of the natural disasters that are occurring across its grounds. The inhabitants of the region, in their own very unique ways have rested with a knowledge system, which has fashioned certain narrativizing, ritualistic, practical and theoretical endeavors to manage the disaster risks. The prevalence of indigenous practices for managing the natural disasters are obvious, but there is a dire need of deep observation and on field approach to investigate the local or traditional activities which are carried out to manage the natural disaster risks. The arena has not been scrutinized with ethnographic intervention to contextualize and understand the indigenous knowledge-based practices for disaster risk management with respect to the cyclic process of management. There is a need of on field scrutiny of the local practices and experiences to contextualize and conceptualize the local or traditional practices. Specifically, the traditional knowledge-based practices that were adhered to manage the risks of natural disasters like floods and earthquakes, which have been long occurring in the region with the prospects to occur in future times too. In particular, the indigenous knowledge-based disaster management techniques for the natural disasters like floods and earthquake, which come about in the region frequently have not been investigated thoroughly. There is a need of directing in-depth scrutiny of the endeavors led by local wisdom to understand and cope with the risks offered by floods and earthquake in the region, with a direct involvement in the field; accumulating firsthand

knowledge of the situations and creating thick descriptions for them. Also, the readiness of local wisdom to appropriate the scientific tenets, to fill the vacuum between the indigenous approaches and modern-day science has not been investigated anthropologically.

3.3. Theoretical Framework

Right away from when the people have started interacting with each other and with the contingent world around them, they started delving the nature of their relationships which they had made amongst themselves and with the landscapes they were interacted to. They travelled through the course of time with prolonged observations, trial methods, daily life experiences and patterned beliefs, which certainly resulted into a system that adhered the knowledge and fact they agreed up on (The World Bank, 1998). This system of knowledge is known as the indigenous knowledge system (IKS), which is the hypocenter of a knowledgeable indigenous community, whereas its expression as visible or in the face value are its epicenter, where they are readily investigate and judged from end to end. The United Nations Educational, Scientific and Cultural Organization has defined it as the knowledge that refers to the know-how, practices and attitudes developed by group of people who have prolonged connections or long histories with their surroundings. It certainly directs the process of decision making on the various aspects of their lives (UNESCO, 2018). Indigenous knowledge system usually marks its position as a profound canopy over the learned lessons, experiences and observations of a certain indigenous community. As the indigenous people express it through multiplicity of traditions i.e. be it the oral traditions, folklores and tales, beliefs and activities, they are called traditional practices (Kimet al., 2017). Thus, the indigenous knowledge is readily exchange with the term traditional practices, for they extract out their origin from the local wisdom of the indigenous people. In the recent centuries the western science has dominated almost every knowledge system around the world. The western scientific approaches have convicted other knowledge systems as traditional or non-scientific in nature, which has decreed the other forms of knowledge as less reliable or more conventional in nature. Albeit the traditional knowledge has been the center concern for sustainability in

livelihoods, resource management, building resilience and risk management, since from the formative years when no experimental science was wide enough to be adopted (Mckinley & Stewart, 2012). Now in this postmodern era, the global knowledge communities have recognized the relevance and significance of the indigenous or traditional knowledge. There is growing concern from all around the world to integrate the two parallel knowledge systems to make knowledge vernacular and integrate the traditional knowledge with the antagonistic other, so that it is made easy for the knowledge practitioners to have a vivid understanding of themselves and the world around them (Truth and Reconciliation Commission of Canada, 2015). Thus in the process of making an inclusive knowledge community, the theory of Traditional Ecological Knowledge (TEK) has started to appear in the literary discourse and in the scientific domains. Although the genesis of TEK is contested, but it is obvious that it is an extension of the traditional knowledge based practices. Levi-Strauss (1963) was the early philosopher to term “science du concert”, which means the native knowledge or the science before the modern scientific inquiries. It referred to the acquisition of the knowledge to understand the relationships of human beings with each other and with the environment they live in (Inglis, 1993). This essential understanding paved ways for the traditional ecological knowledge to be considerate in science and the knowledge domains. Although the TEK shares common proponents with the Traditional Knowledge of Empedocles and Aristotle, and with the Natural Selection of Darwin, yet it holds its own distinctive propositions as in form of social science theory that addresses the importance of traditional knowledge and values adopted as survival techniques and to enhance quality of life. The TEK has emerged as significant proposition to look upon how communities have sustained their livelihoods in certain regions with in harmony to the ever-changing environment around them. It does not solely represent the indigenous knowledge, but it is allocated as the extension of the broader categories of the indigenous knowledge, for an instance the traditional practices in an indigenous knowledge system which have made the core of traditional ecological knowledge (Snively & Williams, 2016, p.8). TEK as a field of study in Anthropology discusses the aggregate knowledge, practices, beliefs and traditions, which ran down generation over generations in form of orally transmitted knowledge, sang songs, folk stories, activities, rituals, beliefs and

philosophy. Unlike the indigenous knowledge, it does not stick to one place and does not only function to provide environmental data baseline but it incorporates the tenets of indigenous knowledge and all traditional ecological practices with environmental plans, climate change tracking and risk management strategies. Later to the emergence of ethno-science and the study of indigenous knowledge by Harlod Coyler Conklin, the field of TEK was first considered to document the indigenous ways of nomenclature and for the documentation the native methods of the classifications of the species. Gradually it took the position for addressing local development based on the evolution of the human relationships and their environment, with their adaptive techniques and native know-hows. The focus mainly rested on the symbiotic features of humans and the nature (Molnar & Dabai, 2021). Houde has identified six distinct aspects of the traditional ecological knowledge to incorporate them with those of the significant other i.e., these aspects may be matched with those of the science, so that they are acknowledged as integral to the mainstream knowledge acquisition. For an instance the very first aspect is of factual observations, which comprises of knowledge about recognizing, nomenclature and typologies of distinct constituents of environment. It is most useful in risk management and to mobilize resources. The second aspect is of the management system which entails the resource management strategies with elements of sustainability, like resource conversion or multiple cropping etc. The third aspect is the past and current uses, it lays the primary focus on the time measurement of the TEK, such as the utility of the surroundings that is conveyed through oral histories. The fourth illuminates the ethics and values, making the relationship of the local beliefs and environmental propositions sensible. The fifth aspect is culture and identity which refers to the understanding of priori lingual system and images giving a living spirit to the current culture, including the narratives, values and social relations that are instilled in a culture as its adaptive components for survival. The sixth aspect deals with cosmology, which refers to how in an order the world functions for the variety of cultures. The particular focus of this aspect remains on the human-animal relationship and how their relationships have tended to influence the holistic social relationships and management strategies (Houde, 2007). All these aspects to be incorporated with science paved ways for integrating theoretical approach like the ecosystem management, which dutifully bespeaks of the significance of

the two parallel doctrinaire knowledge systems. The Ecosystem Management as a multifaceted approach emerged with notion of integrating both the scientific and traditional ecological knowledge, to have a deeper understating of the human relations with each other and with their environment. It mainly focuses on building a consensus to the indigenous knowledge practitioner to integrate their knowledge with the scientific tenets, so that more addressing mechanisms of resilience, sustainability and risk management are introduced. In essence, it certainly speaks of the utility of the modern scientific tool, and never gets away with that only, but also emphasizes the context appropriation and significance of prolonged observations which are instilled in the indigenous knowledge system (Shah, 2019). Thus, their togetherness will go beyond space to understand the cultural landscapes, human interaction with environment and sustainable management of the ecosystem with inevitable hazards knocking unpredictably (Bhatta et al., 2019). As the existence of natural disasters in past and in the future cannot be denied, this theory will help the study to be directed for identification of traditional practices used to manage the risks posed by natural disasters, and how do they get along with the science making an affluent disaster management system (Bafao et al., 2015; Karki et al., 2017).

3.4. The Parallel Scientific Regimes

3.4.1. Local wisdom making the hearth for IKS

While penetrating the literary discourse for indigenous knowledge I came across significant markers of conflict in various knowledge systems. I had assumed the archival knowledge in form of indigenous knowledge might be an agreed offshoot of the universally accepted science. The literature made me question the science in itself. What is science? In the present times what we read in our text books, what we undergo in the classrooms and laboratory projects, and the social sciences' theories to which we readily identify ourselves with, are these the amalgamated knowledge from across the globe? Surprisingly the science in the contemporary times and its methods are exclusively dominated by the Western or colonial knowledge. Every knowledge that is produced or reproduced, in fact the knowledge which is discovered and created do not make it to the scholarly domains, unless they are made referential to and legitimized by the western

tenets of scientific quests and knowledge. (Russel, 2005) briefly argues about the subordination of the inimitable knowledge of a given culture by the western knowledge. He believed the colonial and western discourse have shifted the cultural knowledge at local level, only encompassing the agency of a certain rural community. Regardless of the factual modernity of a culture; as a culture is ever dynamic and adaptive in the given context in which it prevails, the cultural knowledge has been referred as merely story telling in nature. This idea has been enormously reproduced to the extent that now each and every reference on the subject matter which is used in researches, verily legitimizes the western science and invests in a monolithic conception of science. But in fact, the indigenous knowledge or the systematic local wisdom smooths the communications, infrastructure and decision making of the practitioners in a unique cultural setup or in any society. (Flavier et al., 1995) have documented the indigenous knowledge with same degree of inclusivity, they believed the traditional knowledge to be perpetual and persistent, yet not written, and its utility is visible in various cultural activities and decision making. For the purpose of an inclusive approach towards the local wisdom or traditional knowledge, in this chapter I conceptualize the indigenous knowledge system with a more comprehensive understanding of the term. I hope to document a more acceptable and inclusive definition of indigenous knowledge, which is readily interchangeable with the idea of local wisdom to serve the primary essentials for the identified gap.

3.4.2. Understanding Knowledge and Science

Identifying the conception of the process for formulating and acquiring knowledge is contested in academia. Epistemology is always challenged and improvised along with various philosophical canons. The early philosophical quests were made in the pursuit to know how substantially we were created to produce and reproduce knowledge. For instance, the early philosophical debates started with the foundations of rationalism and empiricism, some of the prudent focal lenses magnified the innate capability to acquire and alter knowledge while others believed it as external to human capacity. Yet humans alone are labelled with Sophos for the inquiry of their contingent existence and discursive

world around them, and for that matter human capacity for knowing is not limitless, as John Locke (1634-1704) believed that the knowledge does not go beyond the limits of human ideas. The knowledge in form of agreements and disagreements are dependable to the human capacity of reasoning. With every philosophical work a degree of limit has been put to the validity and scope of knowledge, for instance, Aristotle in his theory of knowledge explains that knowledge is not any kind of fabrication, but the truth which is justifiable in itself. This thesis of knowledge believes that the knowledge can only be verified through our senses, inclining it to an empirical notion of epistemology.

With the passing time formative approaches for understanding the epistemology became concerned with the structure of human mind, and cognitive approaches emerged as science of knowledge laying focus on individuals as learners who dynamically construct knowledge with their cognitive structures (Schuell, 1990). This idea of knowledge construction supports the cultural comprehension of knowledge, which says the human behavior, their culture and their understanding of external symbolic world is profoundly dependent on the existing material conditions and the cultural landscapes. Hence knowledge is confined categorically in terms of its nature and the sources through which it is generated i.e., knowledge can be declarative, procedural, contextual and somatic, coming for intuitions, authority empiricism and hypothesis.

The totality of epistemology as science of knowledge remains debatable, as with the shifts in the philosophical doctrines, the western philosophies dominated the rest of the sophists' interventions. Unlike the formative setup for science and knowledge the procedures and explanations produced by western discourse were taken for granted as science and which still prevails. The global digital division and globalization in form of westernization labelled the other system of knowledge as non-scientific in nature, particularly the native knowledge of other lands and people were discarded as non-scientific. Yet the non-universality of the Western science compelled the scholastic community to rethink on the matter and in the recent decades a shift of focus has been

made towards the local wisdom of the indigenous communities, considering it as native science, which forms the knowledge system of the context in which it prevails.

3.4.3. Indigenous Knowledge System (IKS)

In spite of the technical advancement and the development of progressive scientific era, the artificially intelligent inventions are not considered the extensions or aliments of the natural world. Unlike machines, humans and nature are joined at the hip from the very beginning (Durie, 2004). The relational behavior and the adaptive sociability of humans are inseparable from the material conditions offered by the natural world they live in. It is the adaptive capability and the propensity of sociability of humans, which accumulate the constituents of the complex whole. In a certain culture, the ideology, customs, rituals, norms, conflict management practices, inventions and the innovations have all resulted from the priori acquisition of knowledge, also providing foundations for the posteriori improvisations. Hence the heart of a culture or a society is the unique knowledge system it adheres, for knowledge at times is what the beholder embraces. For an instance the great civilizations known to the human kind had their own unique knowledge systems, followed by their indigenous dwellers, making it unique as per the diversity of the practitioners across various civilizations. This distinctive knowledge system, which took considerably long time to rest as the epicenter of a unique culture is known as the indigenous knowledge system. Thus, indigenous knowledge system is a form of homegrown self-reliance with tracks of progress coming from unique cultural base, in the form of various apparatuses, methods and social organizations, which are readily accepted for managing resources and conflicts. Propagated in the form of traditions, folk stories, rituals, customs, norms, practices and inventions etc. transmitted across generations as potential cultural heritage (Marsden, 1994).

Unfortunately, the indigenous knowledge has been deliberately put into a dilemma; popularly symbolized as distinct from the mainstream science. This might be for the reason that the indigenous knowledge as a system is sustained through idiosyncratic

modes and means of transmission. It is handed over from a generation to the next orally, ritualistically, through customs, norms and repetitive events etc. and in the form of folk stories, metanarratives, practices, behaviors and ideologies. The traditional knowledge essentially entails a human factor as its integral part, all the distinguishing features attributed to it, such as the consideration of traditionality, primitiveness, neo-primitiveness, modernity, and adaptability are inevitably determined by the humans' experiential involvement in it. consequently, these tenets distinct it from the globalized science in terms of the philosophy, methodology and the criterion bases.

3.4.3.1. Synthesizing local wisdom as ancient science

In human societies no process is ever enduring, but the process of evolution. The cultural histories of humankind are evident of the adaptive unity of the natural and social worlds. Although the humans share the psychic unity, yet their acknowledgements of the world around them differ uniquely; bestowing various social experience determined by various natural conditions. Every culture has gone through the crusts and troughs of existence, many of them have vanished and variety of them are surviving. The cultures, which have sustained the historical process of change are rich with a central knowledge system, giving perspectives and providing tools for the practitioners to meet different material conditions, manage resources and resolve conflicts or catastrophes. These centralized knowledge systems are composed of essentials, which have resulted from prolonged observations, experiences, interactions and practices. In a certain culture the indigenous knowledge system is a composition of traditions of agreement, particularly the unity of the social order and the environment in which it exists. The harmony of traditions with the environment is echoed in the songs, stories, titles, customs, subsistence, perspectives, ideas, rituals of demographics and other practices (Durie, 2004; Gul et al., 2012). It is the relationship of the people with their environment in that culture, which determines the constituents of the indigenous knowledge system, where life experiences, patterns of thinking and the social behaviors are considered as the elements of influence which regulate nature of knowledge that is accumulated. Hence the indigenous knowledge or the local wisdom is well-thought-out as the socio-cultural heritage, which encompasses

the history, culture and evolution of the denizens, the relationship amongst themselves and with their discursive environment (Sher et al., 2016).

Although everyday science has reached the zenith of human accessibility, yet a huge portion of world inhabitants rely on the traditional knowledge systems for wellbeing and subsistence in the age of catastrophic natural alterations (Ahmad, 1999). The local wisdom extends a primordial fidelity with the tribal localities and inhabitants of the rural settlements. Be it the local level decision making, simplifying communications, resources management, health care practices or formulating a social order, the traditional knowledge has always remained relevant and prolific.

3.4.4. Natural disasters: Floods and Earthquakes

Disasters and mishaps are apparently understood in terms of the degree of devastations and susceptibility they bring along. Some of them are intentionally or unintentionally induced by human activities, which can be presumed or at least forecasted before their occurrence; with visible hints of human capacity to control them or at least mitigate their prospects to a lesser degree. While there are also hideous yet known tragedies which are inevitable, intact to the natural cycle and unsettling the normal order of the social and natural settlements with high scale demolitions and vulnerabilities (Fritz, 1961). So, the natural calamities or natural disasters are well-thought-out as sudden disruption in the state of being, including both the natural and social state of being. IDNDR (1992) has demarcated the natural disasters as, “*a serious disruption of the functioning of a society, causing widespread human, material or environmental losses which exceed the ability of affected society to cope using its own resources*”. Hence the natural disasters are more of an interaction between the vulnerable human groups and defenseless landscapes, prone to destructions and calamities (Alcántara-Ayala, 2002).

Disasters are often classified according to their speed of onset, which can be sudden or slow, or with respect to the causes which overlap and are not absolute e.g., deforestation have a role to play in the occurrence of floods, where humans are actively known for

deforestation, hence the natural disasters have dual characters of happening, they simultaneously affect the environment and human livelihoods. Natural disasters are widely known for their inevitable occurrence, for they can be mitigated or handled but cannot be eliminated by human capacity. They are not new to this planet, they have been long occurring ever since the know human history, undoubtedly, they have escalated with the rise of human technical intervention and with the population boom, which have stressed the normal consumption of natural resources. Floods and earthquakes are most reoccurring and known natural disasters, which are to a higher degree uncontrollable and unpredictable. Their onset is very sudden and devastating, though the damages by any type of disaster are incomparable, yet floods and earthquakes are known for their higher tendency for destruction and disruption in the normal state of being. Over two decades the floods and earthquakes have intensified and caused more than thousand reported casualties and reportedly they have wedged the public health, especially women (Ahmad et al., 2018).

The consequences and vulnerabilities vary spatially and along with what type of disaster has hit a certain settlement. For an instance, the dwellings of Hindukush ranges are steep and settle over the volcanic routes and unrested tectonic movements. Chitral being settled amidst the ranges of Hindukush and Hinduraj is prone to many-sided vulnerabilities. The steepness, scarcity of plain lands, dry hills and harsh weathers pose a variety of threats to the inhabitants and to the landscapes in the region. Due to high spatial heterogeneity the area is known for incontrollable susceptibilities, i.e., at the glacial outburst and at others the flash floods wipe away the settlements and hopes of the locals (Elalem & Pal, 2015). The earthquakes in the region come along with other shocking disasters, such as landslides and damages to the hanging glaciers, which maintain the continuum of destructions. Torrential rain, water stress and hazards, accumulated debris, rapid glacial melting and the socially fragmented power structures are factors to be considered when exploring the vulnerabilities of the region and its inhabitants (Ishaq & Leghari, 2020; Nadeem et al., 2009). It is certainly not possible to measure how much amount of the flooding or what magnitude of earth quake can cause how much destructions, so it's the

socio-economic condition of the people and the region which are looked upon to measure the magnitude of the destructions caused by these disasters and the vulnerabilities posed by them. The fear of devastations accumulates the inhabitants like that of shepherd's herd, which simultaneously become the hotspot for active or assistive response and also a delightful moment for the political scavengers to serve their purposes. The vulnerabilities prevail in one or any other form, without any promising solution other than the native or locally practiced methods.

4. The Field

4.1. Towards the field for field work

Upon the way to the research field, I got the flashbacks of calamities which I had already seen a decade and half earlier. Casualties were reported, many of the habitable places were withered away and wiped off, the commuting and mobility were hindered, various communication spaces and food security were all caught up with destruction and uncertainties. It was the year 2005 and summer 2007 when the disasters onset of floods was initially observed as potential threat to the settlements in the steep and mountainous areas of Northern Pakistan. People witnessed sudden changes in the weathers and climatic conditions; the series of heavy rainfalls, flashfloods, glacial melting, river belt erosion and frequently hitting high magnitude earthquakes¹³, which had gotten the security of the people into never ending disorder and fears of being recurrently vulnerable to the overpowering catastrophes. The year 2010 was ferocious for upper Chitral than any year before, even the mass destruction of dwellings by the earthquakes in 2005 was over and done¹⁴. Some of the populous villages of upper Chitral had encountered massive glacial outbursts and flashfloods, resulting into damages to the local access, assets and handy resources, such as roads, houses, pastures and woodlands were washed away. I remembered the elders of my community citing the disastrous event as dreadful and deadliest ever to be written in the history of region. Houses were evacuated, livestock was abandoned, people who were resourceful and who could afford to move to other safe places commuted immediately, and those who were trapped with no means chose to go to high steep places to safeguard their lives, along with handy and important possessions. The tragedies did not stop at once, but perpetuated; following the year 2010 every summer in the region started to become nostalgic with the nightmares of annihilations for the inhabitants, year after year the villages in upper Chitral received massive floods and the occurrence of earthquakes inclined. Reshun, the southernmost village of Upper Chitral was terribly haunted by glacial outburst and flashfloods in the year 2013. Houses in the orbit of the deltas and water channels were vanished over the night, a few

¹³ Ajani, A., & van der Geest, K. (2021). Climate change in rural Pakistan: evidence and experiences from a people-centered perspective. *Sustainability Science*, 16(6), 1999-2011.

¹⁴ In 2005 the tremors had turned down many shelters at various susceptible villages of Upper Chitral, Charun Ovir was one of them where people had observed massive residential destructions.

casualties were reported, fresh water sources and water pipelines were highly destructed, the area was unable to receive any instant aid, for the roads and tracks were also blocked due to the gathering of flashflood residues. Subsequently, the dry habitats in the region of Tehsil Mulkhov Upper Chitral had to face huge destruction by the flashfloods in 2015, casualties were witnessed, hearths and skirts of the villages were wiped away leaving behind fears and traumas for the inhabitants. October 26th of the year 2015 shook the entire northern belt of Pakistan, where Chitral was estimated to be 41 miles in the orbit of the epicenter of the quake, the high magnitude hit and its aftershocks crushed down many of the monolithic adobes or mud hut erections. The village Charun Ovir of Union Council Charun district Upper Chitral faced huge devastations, I remember volunteering in the field for evacuation of the livestock and moveable assets and also, I shared hand in the stockpile management for the community to ensure food security and basic aids. I witnessed one of the chaotic and traumatic events I still cannot let go of, seeing people screaming and crying for their houses which had already turned into dusts was highly unpleasant for me. Despite the high magnitude quakes Chitral had less casualties as compared to other affected areas, which already had modern day finest erections, I somehow believe the traditional understanding and perception of disaster management to be the cause for making the community resilient and effectively responsive to such disaster risks. Afterwards in 2016, the village Brep, which is located miles ahead of the village Mestuj observed vast destruction by glacial outburst and flashfloods which together changed the village map and profile. Casualties along with receding houses and perishing resourceful lands were observed, meanwhile other areas, prominently Buni, the headquarter of upper Chitral observed floods annually with increasing glacial water and disrupted continuum of the flow from fresh water sources. Before my intervention into the field as an ethnographer, I already had these recollections of historical profile of the region in my mind, which I had seen, heard and also came across as affectee.

Figure 2

River Yarkhun eroding Mestuj road and southernmost part of Reshun Village.



Note. The Glacial outburst back in 2015 had caused a blockage in the course of river Yarkhun, which changed its direction and river started eroding the farmlands and houses of the locals of Reshun village, (Author, 2021).

4.2. The setting

Upper Chitral as a separate district shares border with the village Barenis of district lower Chitral at South, in the West and North it shares border with Afghanistan and the Eastern boundaries distinct the region from Gilgit Baltistan. Majority of the settlements dwell in between the mighty Hindukush and Hindu Raj ranges, making it the valley of indigenous, whereas some of the vales are in the hideous water gaps and cols of Hindukush and Hindu Raj. The region is alienated with three Tehsils, which are Tehsil Mestuj, Tehsil Mulkhov and Tehsil Torkhow correspondingly, with each comprising of spatial variety and nesting several villages. The villages of Tehsil Mulkhov are located in the Western

ranges of Hindukush adjacent to the area of Tehsil Torkhow and parallel to the dwellings of Tehsil Mestuj that is extended in the majority of the lands and has most of its dwellings on the Eastern belt of Hindu Raj. Nonetheless miles ahead of the village Buni there are villages on either side of the mountainous trap. Most of the regions in Tehsil Mulkhow observe water scarcity and little rain, resulting in accumulation of debris and dry sand, making the area notably dehydrated for years. The adjacent regions of Tehsil Torkhow are full of water resources, but settled in the steeps and hills as there is spatial scarcity of plain lands. Tehsil Mestuj on the other hand dwells gigantic hanging glaciers, glacial lakes and vast highlands covered with thick snow and glaciers. The villages have settled near to the water gaps and lands with water coming from glacial notches reserved in the deep narrow strips of vertically elevated craggy mountains. The villages in the arena are such that they have settled amidst the highlands with water sources mostly coming from glaciers and hoarded avalanches. The villages of Tehsil Mestuj, particularly Reshun, Buni and Brep recurringly receive floods every year and are populous as compared to the other villages in the valley. The glaciers of Hinduraj are stretched beyond boundaries, the Buni Zom and other sister peaks are veiled by thick heavy snow and glaciers, which together build up the hazardous canopy for the village Buni, Reshun and other hamlets in between, yet remain the source for cherishing their livelihoods simultaneously. Whereas, villages commencing ahead of Mestuj including the village Brep are settled in between rocky hills with fragments of glaciers and congregated avalanches which last for a year and more, unlike the far most valley of Borghil adjacent to Wakhan corridor, which marks the genesis of river Kabul, locally referred as "*Yarkhunogh*"¹⁵ which literally means coming from Yarkhun¹⁶ or can be referred to as river Yarkhun. Broghil has approximately more than 40 glacial lakes and nests the Chiantar¹⁷ glacier and many more small glaciers, but the region is stretched over plain lands with a few hills and steeps, making the place damp and wet, hence it is not very

¹⁵ Before entering Afghanistan, the river flowing through Chitral is known as Yarkhunogh, Yarkhunogh literally means coming from Yarkhun.

¹⁶ Yarkhun is a valley in the north of upper Chitral, which commences at the southern border of village Brep and ends where Boroghil valley commences.

¹⁷ Chiantar is one of the renowned and the biggest glacier in Upper Chitral, it marks the genesis of River Yarkhun or Kabul River.

vulnerable to debris accumulation and flow which consequently and gradually result into destructive floods.

Figure 3

Scenic view of mountains of Hindukush ranges.



Note. Mountains of Hindukush ranges stretched over Tehsil Mulkhov, a scenic view from Shakarandeh, Buni, (Author, 2021).

Chitral cumulatively inhabits up to 18 distinct tribes with Kalasha and Khow the most celebrated ones, for they belong to the Dardic Indo-Aryan lineage i.e., they are the indigenous of the area. Khow tribes constitute 92% of the total population and have spread across the valley hailing from every corner of the region. Khows are believed to have Aryan ancestry, migrated from Central Asian regions, Afghanistan and Kashmir, mostly branded for their indigenous language, traditions, music and handicrafts. In the region one can observe 12 varieties of spoken languages, some of them are indigenous to

the region like Khowar, Kalashawar, Dameri, Katviri and Yidgha etc., whereas others have been brought along by the emigrants who for their own reasons had to migrate to the valley. Yet Khowar is the prominent language widely spoken in the region, especially in Upper Chitral. Although the tribes have dispersed across the regions i.e., albeit the diversified majority of the tribes can be easily traced in Lower Chitral, but they can also be found in Upper Chitral, with Wakhi and Kirghizi tribes distinct to the Upper district. Despite the diversity of kinship and familial histories, Khowar is spoken by the dominant majority of denizens of Upper Chitral, which has tended to mold the practices, beliefs and ideas into a unified monumental culture. Tehsil Mulkhaw and Torkhow of Upper Chitral are completely monolingual, where Khowar is the only language spoken by their affiliates, while Tehsil Mestuj is also considerably dominated by the speakers of the same lingual group, yet the inhabitants hailing from the Northern areas of the region, particularly the residents of Boroghil valley speak Kirghizi and Wakhi, contributing to the diversity of languages and practices.

Figure 4

The famous Ckhakasto Zom.



Note. Chakasto Zom is a sister peak of Buni Zom, the mountains of Hindu Raj. Chakast literally means a seashell which conceal the pearl in its heart, (Author,2021).

Being a member and resident of the locale, to my observation I have seen 169,240 people of district Upper Chitral significantly divided into kindred, clans, townships and traditionally connected cultural membership¹⁸. The social relationships vary along the variety of interactive and communication spaces, the bonding, bridging and assistance observed between kins might be different in nature when they act in clans and in the same way they play different parts at community or aggregate level. Social relationships of the place make the trajectory for the prevailing order of social support system i.e., the functions and survival of the vertical¹⁹ and horizontal²⁰ fraternities are overlapping and difficult to understand in seclusion. For an instance, the intervention and utility of modern technologies and markets in the area is a recent phenomenon, I have seen people lending oxen to plough fields, people from neighborhoods voluntarily gather to harvest each other's field crops and exchange of food items between households. When someone dies, traditionally the house of mourning is ought not to warm up the stoves for making food, rather the member households from "*Gram*"²¹ assist the mourners with food, turn by turn until the auspicious time when the rituals of death and mourning are over. People at times of marriage gather earlier to start preparations, and offer prestation in form of cattle, currency and bridal attires etc. This inheritance and visibility of assistive and reciprocal social capitals make the community growingly cohesive, for they are purposefully performed to mitigate the collective burden, give psycho-social support and craft a society with high virtue of norms and values. I have personally experienced that over the time the access and availability of technologies and markets have invited transitions in the social capitals and have left some of the ancient practices long abandoned, such as keeping oxen did not only mean an ease of access but also symbolized the status of a household, a tractor in the field did not only make ploughing the fields. Yet the communities have their own functional social order in form of social groups like village organizations etc. which tend to enhance the welfare and wellbeing of the dwellers in all needy times. The geography of the place is the reason behind the multi-layered susceptibilities prevailing in the district. Poverty although does not relate to

¹⁸ The interpersonal liking based on cultural or ethnic homogeneity.

¹⁹ Based on kinship or common ancestor.

²⁰ Based on neighborhood or sharing common spaces.

²¹ Gram is more of a village council in nature based on the principles of assistance to share and mitigate collective burdens and to cherish rural solidarity.

the disasters directly, but it has significant indirect consequences for the social and natural circumstances, to illustrate, the vulnerabilities for natural disasters are determined by the socio-economic status of at-risk communities and the vulnerable tend to pressurize the natural settings. Wholistically the households are of low income-strata, where the spatial scarcity perpetuates the tendencies of risks and devastations. I have seen residents inhabiting near the streams and channels becoming immobilized at times natural disaster like floods, and those who settled in high grounds face water and food shortage, whereas the earthquakes do not miss any chance to make the situations even more ferocious.

Coming from the literature I had learnt that the traditional knowledge can be easily scrutinized in populous places and amongst the dominant groups of an area who determine and control the nature and flow of the knowledge. I have observed a pattern of stratification among the dwellers of the region, people are highly bound to the sense of prestigious history, possession of lands and subservient strivers, fraternity and dignities in designation of their families in the erstwhile princely state. For example, “*Charwelu*” was post in the administrative unit of the monarchy, comparably equal to tehsildar in the local government of the contemporary power structure, the descents hailing from a family whose fore member had once been dutiful at this post are still called out with the same designatory name, same as the members hailing from the former royal lineage are accosted as “*mehtar*” or the king. The populous regions and the dominants groups were already known to me, so getting an access into the field was not very difficult for in the first place. I spent majority of my time in the already declared disastrous redzones, which are Reshun, Charun Ovir, Buni, Awi, Sonoghur, Laspur, Brep, Meragram number 2, Warijun and Khot, and continentally these are the areas with larger number of households and with concentrated residents belonging with the powerful caste likes or with the clans who have remained dominant throughout the history. The landscapes of these villages are such that they are considered the beautiful areas of Upper Chitral and actual resourceful in real time, hence the prevalence of the dominant social groups in these areas does not surprise me.

5. Local Wisdom for Natural Disasters Risk Management

5.1. Natives' cognizance of natural disasters

“Afat Khodaio ghafat wa, Khodai anogoyan. Khodai angoyan insan hato mashkiran, afaatan insan mashkiran, hato korum shai no boyan. Haya dunya haya zemin Khodaio noo!? Ma oche ta no. Hamo kya waqt ki napak biti shum diss ki hamosum praw wa khur kiagh behchitai zemin di napak hoi. Haya boshairan khio bachen? Zemino nigiko bachen, zemino nigeran insano kardu gandagian safar koriko bachen. Ispa adrakha parwarish biru, haya luo pisa taleemiafta no manimi, kino no birai tu hanisen haya daika ei xhagha bar bar hera kuchawen, bar bar ki kuchetaw hes Kuchai boi. Hoten kia rer tan Kuchay Kuchai. Hes di hash tan insan ghalat diss doyan Khodaio diru dunyosum biko Khodai wa kiagh di koyan. Hate ei salo bolmuxhia Charuno ovira ei dura qandraq chit giti zoman pherki haya sumaragho muxho yu nisi sher. Ma che ta wasa shera hash aleshiko, niki noo? Espa mashkisian, espa ku ki gheraru goyan hato gherusian magar tan khaspo no pechusian, tan shumio no pechusian.

Disasters are God's resentment. God brings upon disasters where humans intentionally summon them; humans deliberately invite disasters through their misdeeds. Does this world not belong to God? Neither it belongs to me nor you. If you deal it with errors and obscenity²² then what good is left in this polluted world. Why do you think it rains? Indeed, to purify this world, He wipes off the grimy marks of humans through rain. We hail from highland pastures, you who have attained modern education will not believe our narratives, to prove me wrong, continuously scratch at some particular place on your leg you will lacerate it. This is called self-immolation. Just like that, humans continuously maltreat this world which is bestowed upon humanity by God, hence He does what He want. In the past year the earthquake had created a trench which stretched from the Village Charun Ovir to Sumaragh Buni Gole, penetrating through the mountains in between. Can you and I do that? We are attracting disasters; we know we are wrong yet we do not let go of our misdeeds.

²² Errors and obscenity in the context refer to the deviancies in the societal/cultural norms and values, where the people are highly inclined towards religious ethos and patriarchal practices.

Whether it is individual, distributed or communal knowledge, the native understanding of natural disasters is based on observations of the events, which are spontaneously correlational. Considerate of my past experiences and the recent intervention in the field I have come to know that the natives of the arena behold mystical perceptions towards realizing the occurrence of the natural disasters, and their causes. Although, the people recognize that they are powerless in indicating and identifying how and what exactly the nature is compensating, but they realize it in the account for the punitive human activities. They somehow accept and believe that humans have contributed in intensifying the occurrence of disasters. The above excerpt is an expression recorded from a respondent who is in his late 70s, it tells a lot about his journey of life and his understanding of the nature around him. Even though his response is reflecting sentiments of religious dogmatist, yet he has stressed the agentic role of humans and their relation with the environment. He has emphasized that this world or the landscape we are surrounded by do not only belong to us, our harsh consumptions and our maltreatments of it fractures the harmonizing fabrics of social and natural being. The essence of his message is implicit, where he tries to explain the reciprocity of exchange between society and nature i.e., if humans continuously deal nature with atrocities, then the nature will must reciprocate with the same.

I have observed that people see natural disasters as kind of punishment from the supreme deity given in the account for the maltreating and misbehaving attitude of the people towards their inhabiting landscapes. Majority of the respondents believe that it is obscenity particularly which arouses the anger of God, and with varying versions of understanding obscenity across spaces. For instance, the village Buni headquarter of District Upper Chitral is a township with growing diversity of dwellers and flexible to transformations over the time and accounts for higher literacy rate as compared to other villages in the valley. The dwellers of Buni have responded with a belief that obscenities²³ are the very basic causes for the occurrence of natural disasters, where they

²³ Obscenities in the area are usually referred to an antagonistic approach towards the socially conservative values which have accompanied with the ideas and teaching of Islam, especially when one does not conform with the widely wore attires and prevalent gender roles.

consider homosexual activities, and socially prohibited intimacies²⁴ to be the absolute obscenity, yet they consider all significant other misdeeds, like overconsumption of resources, deforestation and rapidly growing population to be the reasons for the incidence of natural disasters. The villagers and traditional practitioners from the villages of Tehsil Mestuj almost share a commonness in understanding the prevalence of natural disasters like floods and earthquakes. For example, while conducting the preliminary interviews for the research I came across a respondent who confessed that she had witnessed an illicit physical encounter of a young boy and girl in the woodland of the village and a few days later a thunder bolt first struck the place of incident and then it struck in between the mountains causing glacial lake outburst which wiped off the place of incident at earliest and then destroyed the whole village. Whereas, the other two Tehsils of Upper Chitral dwell in inhabitants who are to some extent inclined with religious and patriarchal conservatism, they also believe obscenity to be the very first and very explicit cause for the occurrence of natural disasters. But their realization of obscenity is very basically attributed with the attire and movement of the women, and the consumption of forbidden things²⁵ out in the nature. To my scrutiny I was surprised with the responses coming from the dwellers of villages from Tehsil Mulkhov, they believe obscenity and vulgarity to be the absolute cause for the anger of God, where obscenity and vulgarity is only associated with the women.

“Xurgini chan biti trang palunan anji yu nisiko afat no di kiagh goi? Ei kama sal prushti haya xhagho tan daq juwanan awa tetan naman no gamin, magam hatet aih hera, aih he xhang doko pashisana hera bi tara pee bongan diti mahfil koraw oshoni, ju bas acha hon giti hera chake laghal kori af nisi baghai. Safansar nast hetan duran awai, espa safo azmasisha pestani”.

²⁴ Socially prohibited intimacies are more of mala prohibita in nature; this constitutes of actions which contradict the morally accepted and adhered values. Prohibited intimacies may include pre-marital and extra marital affairs, or even sometimes the interaction of young boys and girls in public spheres who are not in any close social relationship i.e., affinal, kindred or allied.

²⁵ Consumption of substances and performing activities which are disallowed by the religion and which are not declared valid by the culture e.g., women attiring in western clothes which are culturally declared inappropriate for use.

If the young girls spring out in half naked clothes, will there be no disaster? A few years ago, boys from the same place, I will not name them, up there, can you see the upper slope (respondent pointing at the steep over the village) they were having a party of alcohol and cannabis there, not even two days had passed a flood came and right away from that place it wiped off whatever came in front of it. First of all, the flood destroyed the houses of those who were partying up there, and we all were put to test the punishment.

There is a saying “*Khowar Torkhowa axhi Mulkhowa bordi sher*”²⁶ celebrated across the places of Upper Chitral with a sense of pride and integrity. With that in my mind I was wondering if the language is intimately linked with culture, then in a place where Khowar is nourished I might get ancient philosophies of the natives unveiled and rediscovered. But to my disappointment I was entertained with gendered narratives on the subject of my research. I found people highly inclined towards whole men supremacy. For instance, the above excerpt was responded by one of the villagers at Warijun Mulkhov, the response indicates that there is a firm believe that obscenities by women and agnosticism by men are the reason behind the prevalence of natural disasters. The village is settled in a slope with sand and dry soil, a narrow water channel runs over the village at elevation and above the channel debris is accumulated and dust whirl with wind frequently. In a monotonous conversation with the elders of the village about the village’s historical profile I came to know there used to be a spring lake high above the village which gradually withered away, and there used to be thin forest of *Ghondolik*²⁷ (Fresh Cones) which were over consumed by the dwellers leaving no marks of greenery. I was surprised how the majority of the dwellers negated the fact the unrooting plants could leave the sand and soil drifting and that too in the slopes, increasing the risk for flashfloods in heavy rains. Upon asking that why not they consider deforestation as the major cause for the destructive flood that has already destructed the village, they responded in way that this cutting and uprooting plants in the hills is not new, their fathers and forefathers have

²⁶ Khowar as language was born in Torkhow and it was brought in Mulkhov.

²⁷ This is a multipurpose symbolically significant plant, it used as firewood, consumed while erecting adobes, helps in arousing djinns or enchantresses a person possesses and serves to prevent malocchio.

been doing the same to run the daily household chores and then never any such catastrophes had happened. They believe it to be the modesty and simplicity of in the livelihoods and especially by then they believe the people were unaware and unaffected by western culture and now that they have entered into the digital world, technologies such as television and mobile phones have spread obscenities and vulgarities, begetting punishment of God upon them. Almost everywhere in the region people associate obscenity with disasters in a direct relation. A decade earlier the village Sonoghur which is miles ahead of the township Buni, had observed highly devastative glacial floods, the people of the place believe that alike disaster had happen centuries before and pious saint had buried an amulet underneath a stone in the watercourse and had advised the locals to restrict their women from crossing that certain place. Coincidentally according to the locals some girls went on a picnic a few days prior to the disaster and they had crossed the saint's mark, broke the charm of his spell and made the place impure which resulted in massive floods. I wonder this might not be the case with earliest hunters and gatherers who were settled in the region, for they could not afford surviving with women restricted to the boundary walls and veils, I assume various inflowing cultural and religious values have instilled this sense of purity and pride amongst the mainstream culture practitioners. Although in the light of experimental science and empiricists' notion of truth claim it is hard to believe that these profanes such as consumption of forbidden things, wearing unusual attires and unrestricted mobility can cause disastrous upheavals. Yet we cannot negate the fact the people abide their orientations and positionalities as per these conducts of the communal culture to maintain their harmony with the nature.

There is essential knowledge on the distinction of floods and their phenomenal occurrence; people can distinguish flashflood and glacial floods and can measure. The flashfloods resulting from heavy and rapid rains are caused by the amalgamated debris flow with buoyant rain water. People call it "*Mondroxhogh*"²⁸, it is actually the debris flow and muddy waters coming out of narrows opening in the mountainous slopes which are combined with remains of wood and small herbs, when fall into the delta of the

²⁸ The buoyant muddy water running down from slopes to drainage basin or water course, causing an increase in the level of water in flashfloods.

stream the altogether make up contagious huge mudflow which results into high destruction of woodlands, agricultural lands and habitats. Whereas the people believe glacial flood is usually the over flow of the glacial lakes which frequently erodes the sand and soil in the highland resulting into amalgamated mud flow which is highly destructive. Upon asking the tendencies of risk offered by these floods the natives responded with glacial flood as more dangerous than the flashfloods for they have observed and believe that a damaged glacier with glacial outburst does not stop at once but continuous to tide with shock waves irrespective of the weather and time.

“Sha Yoz phat bik bo khatranak. Hes hash tan phat no boi, ho soro halmast khamir. Halmast yozo hani pahana pat phat koi ki he mula shiru chat ajaluq diti bedap he bakhen ye nisir, hatesum ajaluq dyaw goi tan taa giti achi nuhunjika pat”

Glacial outburst is very dangerous. It does not rip and explode on its own, the thunder bolt hits it and shatters it deep down to its roots and to an extent that the glacial floods underneath the ice comes out with shock waves and continues to flow until it is rested again.

Although this response has come from an individual, it is not merely an individual's perception, it is rather based on centuries old scrutiny of the locals who have been in interaction with the outer world ever since they have settled in the region, and have passed their knowledge to next generations. For instance, people of the place throughout past and present times have been in an interactive continuum with the glaciers in the highlands with the intention to rear cattle, harvest mushrooms and other herbs, and to travel across places, particularly in the ancient times. So, to their observation they have seen glacial ice with trenches and deep glacial lakes, which are if looked into the gaps or in the middle of it the light reflecting the objects and its depth at some distant point disappears, making it dark and fearsome. Based on these observations the locals have named it “*Sha Yoz*”²⁹ which literally means black ice. Whereas, “*Halmast*”³⁰ is a

²⁹ The local name for glacier(s).

mythical creature, certainly the lightning strike or the thunderbolt. This name carries fearful perception of its occurrence, as it is known for the destruction of whatever comes in its grasp, especially it is famous for consuming everything detrimentally. I have observed that the glaciers and amalgamated avalanches are usually found high up in the unreachable elevations or in rugged and narrow gaps between high Rocky Mountains. One can always observe clouds over these glaciers and snowy mountains, usually with intermittent lightening in cold weather, which happen to occur frequently in the summer season, so when in the summer it rains over the mountains with thunderstorms people of the place become afraid of the bolt or “*Halmast*”, which according to the credence of their knowledge has the tendency to hit and tear apart these Glaciers, resulting in the overflow of the glacial brook underneath it with critical shock waves.

“Khodayo diru zemin, espa Lalich kori hera haya kutu sawze, zeminan pologh kori eghoten iskoch koriko kiagh boi ta khyal, Khodaio qahren wa, afat goi. Charuno Oviro no poshtawa, roi ugho sora janjal koriko, tan muxhi eghoten no khomiko, daq kumoru kumoran daq chaleko hash bolmuxhi giti lo kanduri khatarnak bolmuxhi are ish kura hani nuqsan no areni kanduri ki hetan zran arer. Ma xaw hamit hash hami afat, insan tan hawalo ki rokhsitai Khodai to yadi diyer.”

God has granted this earth, with greed we have erected structures here and there, we have confined this land with fences, what else could happen, it is certainly God’s anger resulting in disasters. Have not you seen the village, Charun Ovir? People used to fight over the water, they were not in a harmony with each other, boys double dealt girls and vice versa, hence the earthquake had hit them worst as compared to any other place in the region. My son these disasters are such, if human forget who they are then God reminds them.

If we look at all the provided excerpts, it is common throughout all them that the natives firmly believe that they are temporary in this world where this world and all the things in

³⁰ The thunder bolt, narratively seduced as one of the living things.

it belong to the supreme deity or to the God. Whether it is Earthquake or floods, the natives perceive them as a test and punishment for the nature in the wake of the growing anomies in the society. For instance, in the above excerpt the responded has hinted the greedy and unfaithful nature of humans causing disruption in the organic eco-cycle, in a place where people are highly inclined towards religious beliefs and that too are not vernacularly deciphered³¹ might not reflect on over consumption of resources at the first place. This belief is prominent amongst the elderly practitioners of knowledge in the communities, who are multi lingual and have witnessed the rise of Islamic fundamentalism in their lifetimes. While the adults and youth have a peculiar and hybrid understanding of the natural disasters, upon asking and observing I have scrutinized the adults who are literate have the flexibility of sheer acceptance of other reasons such as deforestation, over rearing of cattle and spatial scarcity for settlements to be the reasons for natural disasters' induced risk, yet they cannot delineate the transmitted social beliefs on obscenity and vulgarities causing natural calamities. Given by the fact that the region has higher literacy rate for the youth, so the youth are pro scientific reasons for disaster happenings. I have observed the elderly dwellers repenting for their deeds and for that of other at times of emergencies, while the youths are not remorseful for whatever causes the tragedies expect for exploitative actions committed by the people. I have observed a gap in the transmission of the communal beliefs over the generations, acquiring modern education can be one of the causes but it remains a fact that the beliefs and understanding of natural disasters in indigenous ways have changed over the time. For example, a young respondent in his late 20s had said:

“Qudrati afat kurar goyan ae ma brar, het safe spa tan kishman, payan adrakha aliko drono phur niki, kan manan diti khatum areni, ya jeep gani bim himo load diti seri bezemiko tan hon goi wa. Chara bi dur koriko bolmuxhi tan ta duro yu ghere wa. Espa e miki ran na haha! juwanan goltu bi tara piyaw he hono espaten yu angomian re.”

There no such thing like natural disasters, these are induced by us; the cattle have perished herbs in the pastures and highlands, cutting down plants excessively, or if the

³¹ The plurality and appropriateness of other values with the indigenous values and practices.

people load the glacial snow in the jeeps to sell them in the markets, then floods are inevitable. If houses are built on a hilly slope, then the earthquake will for sure abolish them. One of my uncles say haha! (satirically) the youth consume alcohol nearby the water streams and are thus inviting the floods.

With the provision of his own understanding on the natural disasters the respondent has also tended to negate the belief of his elder in the community. He satirically expressed the belief of his elder who is also of the opinion that consumption of forbidden liquors has caused the floods. This might be due to his firm belief on what he learnt to be the phenomenal causes of the disasters. As he has initially stressed that disasters are not natural and he has provided deforestation and spatial compulsions as factual reasons for the occurrence of natural disasters with maximum human involvement. This belief does not come from the tales and knowledge transferred by his father and forefathers, it is rather his own research or may be knowledge acquired in the educational institutions. The ancient or the old knowledge system for the understanding of disasters and natural disasters is based on blaming unusual and alien activities such as wearing western attires, the interaction of boys and girls particularly when they are in hideous relations and ungrateful attitude of humans towards the nature and God.

5.1.1. Commemorated mythoi on floods and earthquakes

If the locals are asked about their ancestral heritage, surprisingly every kin group has its own cooked up history of migrating from other regions, mostly from Afghanistan and Central Asia, where they believe that they were once used to be the ruler of the place or profoundly connected to power relations and have firm believe in their genealogical supremacy. It is not surreptitious that the diversity of tribes and clans were once emigrants at some point of time in the history, they verily have come from different cultural and religious belongings. And also, if we look at the indigenous language of the region i.e., Khovar, which is a Dardic language or the language spoken by Dards who belong to Indo-Aryan group of people, commonly and predominantly settled in Northern

Pakistan, Afghanistan and in Central Asia. So, coming from different roots and in the wake of social change, if not evident by written facts in terms of the modifications the language and culture have encountered, one can straightforwardly assume that this current culture in practice cannot be identical to the one prevailed in ancient times. Be religion and diversity the factors of this molded culture in practice, various immigrants had brought along different belief system and practices which were gradually brought into the real cultural spheres. Being an active member of the community based on what I have seen and observed throughout my life I can tell people of the place are fond of music and storytelling, which are highly appropriated with myths. Usually, the stories and beliefs for daily life practice contain the idea of existence of celestial beings and mythical creatures, for instance when an animal such as cow or other cattle die in sheds build adjacent to the local houses, people say “*Shiri*” is angry or upset for some reason. “*Shiri*” is a mythical creature believed to be the protector of cattle in the sheds from the evil. And when an animal from the cattle dies at pasture they say “*Shawan*” is upset, where “*Shawan*” is the protector of cattle at highland pastures. Just like that there are myths attached to happenings of disasters. Elders of the community believed that the floods do not come by their own capacity, it is rather brought and directed an otherworldly creature called “*Hono Gor*” which literally means enchantress of the flood. And sometimes it is believed that creatures like djinn, fairies and witches inhabit in the pastures, highlands, mountains and near to the glaciers, when an progeny of these beings accidentally dies or dies due to human activities then the superficial creatures cause a flood which carries the dead body of their offspring to the houses of the settlers with destroying everything it meets, until the dead body of the creature, which is called “*Uru*” is found and buried facing the place where it has come from and with appropriate rituals burial and charity, the flood continues to abolish the dwellings and belongings of the human inhabitants. Unexpectedly where ever I went on the field to examine and observe the understanding of the locals on natural disasters like floods and earthquake, I came across stories full of unbelievable events and fictional creatures. Such as a respondent in her adulthood from the village Brep responded in this way:

“A xhaw afat kiagh boi, kia ishnari ki ta buhtuwetai afat wa, espaten chhek haya hon, hamoghar lot afat kiagh boi. Prushti zamana aih he golo bila he dok sher kia he achtu ki

baw e safar ugh goyan piko bash e wa hash khadur ugh sher hosum hate ugh amusht baw hash royan guruli nawastai, guruliogh reni hatoten, wa hase tan hash hon gyaw royan niamatan alaw duran alaw xano sha korawastai. Biko aih he rizan doko teka peer astai hase ho dam diti dam band kardu birai. Kanduri saala acha e kama sal prushti he hon hash wa achi hai giti tan pashisan tabah kori pechi sher. Roi aih bi lalinian ki hate peer o zenakh af chori sher, biko to kol di pheru honi wa hate dua kura behchuran kia, hate dam asar khatum biti hash hon haye.”

My son what will be a disaster, anything that comes with ferocity is a disaster, for us it is the flood, what else could be rigorously disastrous than this. In the old times up there behind that high ground there are two watercourses, one of them is potable and the other is already polluted, the unclean water was contaminating the clean watercourse resulting in diseases like goiters, the contaminated watercourse is known as “Guruliogh” the one causing goiters, and it is the same rivulet which has caused many devastating floods. So, over the Riza brotherhood’s high ground a saint lived up there who had these floods stood still with his charm, the floods had stopped by then until a few years back it came and you can see what devastations it has caused. Upon reaching his grave people observed that his jaw bone had already fallen off to the ground, so if his remains had turned into dust and ashes then how can his incantation be still influential.

I have found fables like this almost in every flood prone or at-risk community I visited, observed and participated in. In every flood prone village in the area you would certainly get to hear tales and fables like this, there will be a saintly male character in the story who with his charm and spells gets the floods stopped. Specially the belief of enchantress coming with the flood is widely celebrated so in the majority of stories the saint restricts the harmful entities within their borders and allowing the dwellers to sigh with relief. The dwellers of Buni believe in one such story, I personally belong to this village and ever since my childhood I have been hearing a story of a saint who rode a stick and changed the root of the stream to the current watercourse path. It is said that the stream once flowed in the middle of the town and had huge destructions with massive floods every year, upon requesting by the villagers the saint carried a twig, rode it and

flied to the genesis of the watercourses and with his stick he drew a line paving new way for the water to run down to the river and ever since then the stream flows in that direction. The natives truly believe in pious saints, wanderers and sorcerers, even though none of the living denizens have witnessed it themselves yet they have faith in these stories and believe people with charms to have influence on the natural disasters like flood.

Various indigenous communities have distinct understanding of the landscapes and happenings around them, people make the natural phenomenon symbolically meaningful by associating them to their living conditions and the belief system they have already inherited. Believing the fact that Khowar is a language of Dards who are progeny of the Indo-Aryan people, one might not find it surprising that it has been an offshoot of old Sanskrit, hence different beliefs are inclined towards Sanskritic and Vedic belief system, if not in their truest form but they share sheer correspondence with their essence. Typically, the natives of the region believe that the world has been created on bulls back and the earth has rested on its horn, and whenever the bull shakes it, quakes all the inside entities. This belief shares a correspondence of essence with the tale of four elephants carrying this earth on their back written in Vedas, which according to some traditions is also believed to be a bull carrying this earth on its horn. In both of the versions it is evident that the earth is rested on or above an animal which intends to bear the weight of the earth but as for the animal cannot stand still with a continuous gravitational pull so it causes earthquakes.

“Haya dunya reshuo srunga thee shak birai reni, hes hatoten qayeko e srungar e srunga pesak birai biko hes pura dunyo lengak birai espa hoten bolmuxhi resi.”

The earth has relaxed on a bull’s horn, whenever the weight of earth bothers the bull on a horn then bull shifts it to the other horn, and meanwhile it shakes the earth, we call this trembling of earth “bolmuxhi” or earthquake.

This perception prevails throughout the area, particularly amongst the illiterates and people in their late adulthood. I believe this is one of the ancient and oldest belief which has been transmitted to the contemporary times with minimal changes. Although the pursuit and acquisition of modern education and contagious religious attributes have caused alteration in the current belief system, but somewhere deep in the discourse one can still find the original tales and their roots. I have observed appropriations from religious scripts which people readily express as their hope for not being subjects to disastrous quakes. Such as, one of the key informants had responded that:

“Hami zom mikh na haya dunyo teko, hamo sora mul biko no lakoni”

These mountains are fixes on the surface of the earth; they do not let it turn upside down.

This reconciled belief is actually an influence of the religious ideas on the traditional knowledge, in essence, given by the fact that there is no other religion in the arena except for Islam, and this believe comes from Surah-An- Nahl 16:15, where Allah refers to mountains as holding nails fixed on the earth so that they do not let the earth tremble with shocks. Recording the response from an illiterate elder of the community I do not have any second thoughts on any the origin of this believe but Islamic teachings.

These tales, folk wisdom and beliefs might have been in their original forms but culture as a dynamic human product absorbs and appropriates other traits and values. In the ancient times, the Northern regions of Pakistan, particularly the dwellings in the mountains used to remain cutoff from outside mainland due to geographic and climatic compulsions, so for knowledge practitioners who had no other options left except for mythical presumptions on the phenomenal surroundings. The folks are well aware of what tendencies disasters like floods and earthquakes have to destroy the habitats and the resources, also they know how they are composed and in what way the must happen but there is either lack of investigation or the natives might have not been equipped with necessary tools and adequate techniques to dig out causes and reasons for calamities like floods and earthquakes. This also indicates the lack of innovation or a lag in the

traditional cultural system, as per the nature and origin of the language and the indigenous lingual group one can easily say they are centuries old but why have not they evolved with modern techniques or what has hindered them to get apart from myths and find empirical causes still remains a thoughtful question.

5.1.2. Vulnerabilities of the locals

It is certainly not possible to address or infer the natural disaster induced vulnerabilities at individual level, hence the susceptibilities of the at-risk communities are generalized to get a wider perspective of the natives for agenda setting when managing disaster risks. The vulnerabilities and weaknesses are multifaceted and vary along the changing landscapes and verities of natural disasters which occur in the region. A village settled near the water stream might be vulnerable to fluvial floods unlike a village settled on a slope amidst the mountain rocks which might be vulnerable to earthquakes to a great extent. In the past and in the recent year I have seen many disaster calamities at different places inside the region, i.e., when in 2010 it flooded massively in the village Buni, people had no idea of what they were facing and how are they going to cope with it, all of the villagers who were settled nearby the fluvial stream evacuated at once, leaving behind cattle, elders and disabled who were difficult to carry and all other belongings of the household. I assume this had happened because they natives of the place had not confronted any such catastrophe ever before. The flood did not stop at once, it was made known that the flood was caused by the glacial outburst by looking at the ice bergs flowing with the flood. So, the locals had the prevailing ancestral knowledge about glacial outburst that it would not stop immediately but will continue to flow and bother the dwellers even in the coming years unless it is healed naturally. Thus, for the fore coming disasters the dwellers had sort of prepared themselves mentally and with resources i.e., the community dwellers had already kept the safe evacuation plans in mind and had isolated their especial belongings to carry along when they leave their houses which are located at prone hotspots. So, with time and with nature of the menaces the priorities of vulnerabilities also change, yet some of them remain stagnant, such as the building erections, agricultural lands and woodlands.

The topographical setting of the arena is such that there are no plain lands, most of the houses are built at the bumpy steeps or near the water streams. In the wake of the fact that more than 75% of the total area is covered by mountains and the rest is occupied by the houses, woodlands, agricultural lands and barren plains, so there is a spatial scarcity for residency, urban transition and internal displacement. The biggest fear of the dwellers is the fear of losing their abode, if in any case the villages and houses are razed to the ground the victims do not have any other place to get settled in. Also reinforced by the literature it is true that the residents and households with low socio-economic status have occupied the most vulnerable places, so they are left no choice but to wander in vain if the floods and earthquakes ever razed their adobes.

“Espa safosar lot buhtuni haya ki, hami egan kutu espasum sheni egan phonansum, he golo pashisan he gucho espa zemin pura awai hamitan di ki awai wa espasum kiagh behchitai, bolmuxhi wa di khair duran ki yu gheretai espa hetan wa sawzesi”

Our biggest fear is that we have only these muddy adobes with small farmlands, you have seen the watercourse, our lands adjoining it have already been wiped away, if it wipes away our adobes and these lands then what is left, earthquake is not a big deal if it destroys our houses, we can rebuild them.

This is a response taken from on field respondent at the village Reshun, the village has always been a flood prone area, but in the recent decade the upheavals have been witnessed in disaster calamities. When on field I met some of the villagers inside the water gap where the two narrow glacial streams meet, people were busy in reconstruction of the water channel which

Figure 5

Footprint of an evacuee in the village Brep.



had been washed away by a flashflood a few days earlier. Upon requesting I got the chance to sit with the elders of the community who were guiding the young villager to place firm boundary walls for the water channel. The seasonal calendar and historical profile of floods in the area had left me shocked. The people of the place actually get ready and prepared for managing the flood-induced risks by the mid of May every year, according to the natives they witness a rise in the water level of stream earlier in April and by the mid of May the water starts getting turbid and muddy, mixed with the eroded soil. This muddy water continues to eat away the adjoining lands, up until it is June when the rise in temperature tends to increase the water level, this is the time when people start to keep their eyes and ears open to cope with any sudden disaster onset. This happens to continue steadily if the place does not get any unusual rain, up until it is late July when it starts raining. The rains by end of July and in August buoyantly carry all the hoarded and residues, and when it gets the momentum while flowing down, it only rests when it reaches the delta of the river and in that case too sometimes a heavy flood blocks the river, resulting into river belt erosion, which tends to destroy the only jeepable route of commute throughout the district. Parallel to the southernmost part of the village Reshun, on the other side of the river, there was a

huge sandy terrain, the place had wide opening, usually people went there in winters for duck hunting, thus the place is known as “Alliyan”, originating for the local term “Alli” which means duck. In the prior destructive

floods, the river Yarkhun was blocked at

the same place and stagnantly increased, until when the blockage was removed the place was completely destroyed and the barren sandy terrain parallel to the village had started eroding, I myself have witnessed the erosion and falling of the sandy dunes into the river with dusty winds wafting in the nearby places. Up until the recent year the situation worsened, the river ate away considerably large agricultural lands, the roads were vanished, many houses disappeared over the night and the villagers were left with no option other than

leaving their ancestral home places forever. The historical profile of flood prone areas like Reshun, Buni, Brep, Sonoghur and others is such that they have witnessed causalities, destruction of houses, agricultural lands, woodlands and livestock have been harmed. These had all happened somehow in connection to the scarcity of lands for safe residences, the spatial and resource scarcity to build high protection walls to guard their belongings. The potable water is usually initiated from the highlands where spring lakes are found and where the stream is far from being polluted by the dwellers for their daily household chore’s purpose, and through pipelines they are made available in the villages for the villager to get a pipeline link and satisfy their daily life water usage. Also, the channel for irrigations is extended from the belt of streams and the watersheds which are purposefully utilized to irrigate the farmlands, forests and other greeneries. The menaces and consequences of the floods are such that they wash away the pipeline making a shortage of the potable water and also wipe of the drainage of the irrigation channels so the crops in the farmlands wither away in matter of few days.

Figure 6

School kids crossing a water stream after the flood has destroyed the road and bridge.



Note. Source, (Author, 2021).

“Oh! xhaw safosar taklif he hon, yu giti pipan aliko xoyan aliko pikoten ugh len no boyan af niyamat puli phuff bonian. Kanduri saal hoi he qesma zekhti gosian”

Oh! son flood is the most difficult one, it wipes off the water pipelines and irrigation channels and making shortage of drinkable water and the water to irrigate the crops. Several years have passed we are facing it.

This is indeed a consistent vulnerability faced by the dwellers of all the flood prone village of the district. People at times of flood face the shortage of drinkable water as a damage in the pipeline and in its initial sources affect the whole drinkable water supply of that certain area in which it happens. And usually, the floods come by around the season when the natives irrigate their crops, so at times of floods most of the farmlands are left dry with crops left dehydrated. This past summer I witnessed rice crops at my village were dehydrated and most of them had withered away, upon reaching the source of channels I saw sediments and residues had filled the irrigation channels. Earlier to that day there was light rain in the highlands which caused a drainage basin that carried thick mud down to the stream nearby the village and almost all of the irrigation channels were destructed.

Due to the geographic and climatic compulsions and considering the lower income strata of the natives, their adobes are erected on mud bricks. Up until recently in the 2000s people started concreting the foundations of their houses and still in the area majority of the houses are constructed by mudbricks. While some of the areas which are settled in the highlands such as the village Charun Ovir and Barumkagh Kosht, and villages settled near the river belt like the village Biyar, the majority of the houses are vulnerable to the razing quakes. It is mainly because the adobes in these villages are settled over sandy soil which is not stiff enough to hold the mud bond together and firmly erect an adobe on the surface. The natives have no absolute fear of the earthquake, despite the fact that there prevails an indigenous mechanism to cope with earthquake induced hazards. The people

only fear it when they are high up in the mountains or in the newly erected concreted houses, yet it continues to threaten them in the form of posing harm to the cattle sheds which are not as firm as the houses of the people.

5.2. Traditions of harmony

Even though the cognizance of the natives is inclined with superstitions and traditional or religious rigidity, there also prevail significant indigenous traditional methods which have sustained the unity of the social life and the natural situations. In essence if the risks brought by floods and earthquakes were to be managed and cope with by only eradicating what the natives perceive as obscenity and vulgarity then there would not have been possible to survive or rehabilitate after disastrous tragedies. As discussed, the perception and idea of vulgarity and obscenity arousing the anger of God might have been borrowed by the religious ethos, the traditions of the place and the knowledge crafted in the community date back to the times when Islam was not introduced in the region, even before the arrival of Islam in this world the region had its own established social order, this is very much evident by the history of the language spoken in the region and Dardic lingual groups in the region who sometimes between 1500BCE and 500Bce had settled in the region. Before Islam, the Kalasha people or the Waigali language along with Khowar was prominent in the region (Halfmann, 2021). By then and now if we look at the practices of the surviving Kalashas, they worship idols and the community is more of matriarchal in nature, which contradicts the current cognizance and practices of the Khow people who were at one time in the history shared a complex akin to the Kalashas. Now that the Khow people observe Islamic homogeneity, one can basically assume that many of the beliefs and the value orientations have been borrowed from the philosophy of the social groups who promoted Islam as religion in the region. Despite the historical hurdles the natives have sustained the olden traditional knowledge system, some of the knowledge crafts have been incremented duly and other have been overlooked in the process of social change.

In the wake of the recurring natural disasters like floods and earthquake in the region, every then and now the disasters have been coped with the significant indigenous knowledge initially. As the risks induced by the floods and earthquakes and the devastations caused by them had existed before even any humans were settled in the region. With primeval settlements the process of observation had started, since then with the continuum of scrutiny and amalgamation of principles from other interactive social groups the people of the region have built a disaster management context which is deeply embedded in the real culture of the region. The traditional knowledge practitioners have variety of functional strategies to manage the risks of floods and earthquakes. As an active member of the society, I can reflect on many traditional practices I have observed and been involved in, such as since my childhood I have heard and continuously been told that “*Hon tan giru xhagho shor sal acha di goi*”, which means that a flood might temporarily change its route but it will flow in its oldest route even after centuries. This proposition has been made by my father and forefathers, certainly it is based on the prolonged ancient observations of the natives who have endlessly confronted the challenges and risks induced by floods. So, whenever a person or people intend to build a new house in the region, at the very first instance they ask the elders about the land where they intend to build a house, whether the flood had once flowed across that particular place or not. Just like that the traditional practices for natural disasters are rooted with many explicit and implicit knowledge trajectories.

5.2.1. Traditional modeling for flood risks management

There is a diversity of knowledge-based mechanisms which have structured the traditional ecological knowledge system in the region. The beliefs, practices, ideas, innovations and observations have formulated a strategic indigenous knowledge system which tends to address remedies for the risks induced by floods with cyclic management techniques. Although I have known some of the techniques before the field intervention, even I have personally involved in some of the significant disaster management activities, yet while interviewing the key informants and upon scrutinizing the setting in the light of the set objectives I have come across several traditional knowledge-based practices which

are new to me or in my village they have been overlooked as per my observation. The criteria of these knowledge-based techniques are such that fall in the categorical methods of disaster management i.e., they can be categorized as preparatory, responsive, mitigating and recovery techniques. So, my efforts will be directed to present them in the chronology I have just mentioned. Before introducing the traditional maneuvers, it is essential to know these pragmatic approaches and activities as social actions. Parson (1937) had argued that social actions are composed of motives as an integral part of it, a social action is purposeful, principled and has a certain presumed end. so, while considering these traditional practices we must see them in their social context, and already keep in mind that they have been performed with certain anticipated results and which are not continuous but are self-sustaining as per their utility.

5.2.1.1. Anticipating the floods

The natives have their own crafted system of beliefs and practices based on observations and experience which have been effective while forecasting the prospects of floods and their hazards. The prolonged scrutiny of the natives has made it certain that in a seasonal calendar the summer is the only season that has nightmares in the store to shock the people with destruction. Usually in majority of the villages in the region they have both houses at the highland pastures and also and down in the villages. In summer the villagers shift to their houses at pasture lands, where they rear the cattle and accumulate resources such as dairy products, woods and animal dung for the commencing winter. While living in highland pastures they observe every single entity they are surrounded by, be a ring-shaped worm one them, which lies beneath the soil crust and does not come out except for when it anticipates the flood threat or heavy rain. According to the natives when in highland they see this worm coming out of the ground they get indulged in the preparatory activities to keep themselves safe from the flood and rain, while remarking the popping out of the worm as symbol of menace that is yet to come. Just like that unusual behavior of the cattle in the sheds helps the locals in anticipating the hazards i.e., in the summer season when its cloudy the natives and particularly the elder knowledge practitioners can tell whether the clouds will shower or not, and if there are dense rainy

clouds which make the cattle uncomfortable or when they try to escape the sheds it is certainly a sign of danger, probably the flood which is predicted in advance. Other than summer season when the cattle get terrified the natives foresee the prospects of earthquake, for they believe the animals become aware of the natural disasters in advance. I have observed when the red ants come out of anthills and when the red billed cough all of the sudden start flying in the sky with twists and turns then the elders say it is about to rain. Although many a time I have seen this proposition as flawed, but I have also seen it raining after the phenomenal movement of these birds and insects.

“Hate lot honar prushti tajub poshtam, xhingogh khalawa malaw rah rahi tip biti astani tan mallar yu nisaw, shali mal etu diti doghetani. Ma tat hate waqta tan re asitai kia afat espa sora sher re. To luo ghon hon gyawastai, giti he xaaghan lin kori af nistai, he gogh chawat hami mal nast tan pesaw baghaw hetanten pata biruo ghon.”

Prior to the sever flash floods occurred in 2010 I was surprised to see plenty of scorpions and rodents fled away, the sheds resonated with moos and bleats of cattle. My father had forecasted a danger by that instant. He was right the flood was upon us, it came and obliterated the natural habitats, these insects and cattle had already fled away as if it was known to them.

Upon hearing this response as an experience from a responded I was thinking whether these are super imposed, or can it be possible that these events have coincidentally occurred? But to my surprise this response has not come from a single place or respondent, its rather observed in every flood prone area, particularly in those villages which are vulnerable to flashfloods and which have drainage basins in the glacial surroundings. The access to weather forecast and broadcasting technologies are new to the place, a decade earlier there were a few numerable households in the region having televisions and radios, and prior to the technological advancements the natives solely relied on the observation of the walking and running of insects and other animals.

Other than the unusual movement of the animals, the natives hold an account of ancient shamanism and divinatory prophets. The shamans observe a reputable status in the community, they often get visitors who believe in evil possession, cure for miserable diseases and to predict what the future has to offer them. Just like that the divinatory prophet reads out holy scripts, pick particular spells and recite them to unfold the prophecies which nature has veiled for the commons. Earlier in September when I reached the village Brep I saw just recently a flash flood had expunged the flood protection walls and filled the surrounding farmlands with slushy deposits. I had to visit a key informant conveniently and meanwhile the discussion he told me about a divinatory prophet who had predicted the recent catastrophe earlier than it happened and when I requested if could meet the prophesier, fortunately he was nearby the house of the respondent. When I reached the prophesier, he confessed what I had heard was true, he says he has inherited this knowledge from his father and fore fathers. Although he did not disclose the process and spell charms, but when requested to see if there were more floods to come, he picked up rosary and started murmuring. A few moments later he stopped and put down his rosary and claimed that there are no more flood risks even in the next commencing year the nature will not bother the villagers with any uncertainties and destructions. They say this method has been primordial to their ways of knowing the nature and changes in it, this method is not only effective for anticipating floods but it also utilized to identify auspicious time for various events such as marriages, growing and harvesting crops and foreseeing the death of an aged person etc. So, the prophecies of prophesiers, predictions of the fairy possessed people and necromancies have pledged primordial fidelity to the traditional knowledge system in the region.

Just like the prophesiers and fortune tellers, there are indigenous knowledge practitioners who believe in the planetary movement, stars, moon and the sun to portend the future. These fore casters are locally known as "*Hamal utak*" who perform a very keen and sophisticated processual activity of forecasting the called "*Hamal utik*", which is more of a calendrical system to predict events of the commencing year. "Hamal" can be referred as productivity, yield or fertility, the practiced is typically carried out on the 20th or 21st

of March, considering 21st march to be “*Nowroz*”³² which literally means new day. Nowroz can be traced back to the Sasanian pre-Islamic period of 3rd to late 6th century Zoroastrians, in the Persian calendar it is the beginning of spring and the new year which brings along the bliss and prosperity (Sharma & Yosufi, 2018). On this day the forecasters decorate the gathering with the traditional instruments to foresee the productiveness of the commencing year. Commonly the foreseers possess round shaped smooth stones and spiky metallic rods, they behold the fixed stars and the moon along with planetary movement, and at a particular time in the orbit of midnight of when 21st of march is commenced they penetrate the pebble with rod. At that certain point of time the pebble becomes doughy enough to be pierced with a metallic rod, this section of the practice does not closely relate to the indications for the forthcoming seasonal and climatic changes, but the practitioners also observe the weather on this particular night. According to this traditional exercise, in the orbit of midnight of this day if it rains then the native practitioners presume the year to receive heavy rains and the fertility or productivity of the year will not be significant for the natives. The foreseers or the “*Hamal utak*” say “*Hamal ugho baghai*” which means the productivity or fertility has drowned, and if in the night the sky is clear with glittery stars and with mild winds, then they consider it a good portent and believe the fore coming year to be productive, fertile and least destructive. The fertility drowned in water does not only indicates a catastrophe for the crops, but also a major threat to the landscapes, for receiving heavy rains mean higher are the chance of occurrence of floods.

5.2.1.2. “*Tzaq*”

Traditions of unity are such that the humanly practices or traditions have been fashioned in ways which keep a balance between the social and natural worlds. Usually, the traditions of unity are referred to the resource management and mobilization in social context with given natural conditions, just like that the harmonizing traditions are performed to maintain the social and natural world in a harmony. Harmonious traditions are meant to keep coping strategies for the uncertainties arising in the social and natural

³² Celebrated as new year and start of blessings with spring in some parts of Afghanistan, Iran, Central Asia and in Norther Pakistan.

worlds, balancing and compensating the social and natural circumstances is a major motif of the harmonizing traditional wisdom. “*Tzaq*” can be considered as one of the indigenous traditional practices which intends to keep checks on the interaction of natives with their landscape, particularly on the consumption of resources from the highland pastures. Although I hail from the same region, but to my astonishment I had never heard about it or seen it before, be urbanization or availability of resources at market be the reason for quieting of this centuries old tradition in my village. When in the field I interacted with the key informants, I repeatedly came across the concept of *Tzaq* as practice which was agreed upon by the locals to keep a balance in the consumption of natural resources like woods and herbs in the highlands, or in the pastures specifically in areas which surround glacial lakes, glaciers and in the sandy slopes in the mountains and hills. This practice is phenomenal with coercions, and it is not bounded by any particular time to begin an end but when it begins, it begins with a motif. For instance, mostly the villages of upper Chitral are settled near the watercourse and water gaps, which run down from the highland or the elevated glacial cols, these gaps and cols are mainly utilized for rearing cattle as pasture and also the woods found in these areas are cut down for various purposes including, making fire for cooking food and erecting a traditional adobe. Predominantly, in 20th century epoch there were poor market interventions, the livelihood of the mainstream dwellers was inclined with ancientness, people rear cattle, went hunting, and cut the woods in the elevation to make living and surviving in the harsh region. And the social order of the dwellings is such that the elders of the villages who are the messengers and ambassadors of the traditional folk ways usually decide the proponents and verdicts of the socially assistive structures. So earlier to the declaration of the *Tzaq* sanctions, a knowledgeable member from the community is send to visit the highlands where woods, grasses and other herbs are in abundance and where the communal inhabitants rear their cattle. While on his way back to home if he carries wood and grasses then it means there are resources in abundance which indicates that the villagers can carry on their consumption of resources from the highlands no matter how. But problems arise when he comes back with only one of them or when he comes empty handed. In case of when the messenger comes back empty handed, the elders of the village or community declare *Tzaq* or the sanctions; none of the villagers are then

allowed to cut down the woods and bring them home, or to rear their cattle unless and until the revisit of the messenger and his indications of wealth in the pastures. If he comes with wood only then it means villagers can go for fire woods, cut down trees for making living happen but they cannot rear the cattle in the pasture for the absence of grass means the greenery is near to extinct, and he comes with grass only then the dwellers can rear the cattle but cannot cut down the trees and bring them home. In case of violation, if any of the dwellers is caught violating the rule, it is already agreed that the woods which the violator intends to bring home would be burned until ashes whirl with wind and the finest of his cattle will be slaughtered and distributed amongst the beneficiaries of the agreement. According to the locals, often times the sanctions were also suspended for a week or two to loosen the pressure on community and to restraint poverty.

“Tzaq tha jam oshoi kia, kanduri wakht adrakh band biko kan bordaw oshoni, nogh kan axaw oshoni, hash mondorxogh no gyawutani, ugh jazab baw oshoi ya khali safar tan af nesi boghaw oshoi kia rai kiagh no angiti”.

Tzaq as sanction was a better option, once it was ordered the highlands were closed for the consumers, giving a relaxing time for the trees and vegetation to grow and regrow, no drainages and flash floods were observed, the plants and greenery either absorbed the buoyant water or it reached the basin without sediments or residues.

The above excerpt is evident of the experiences of natives in an ordered system where some regulation imposed by the community were intended to recover destructions and prepare for the natural uncertainties especially flashfloods. To my scrutiny I have observed people talk about *Tzaq* with remorseful sentiments as if it has not been sustained or abandoned. “*Tzaq*” as of a sustaining mechanism provided a timeframe for the nature to restore its relishing landscapes, particularly afforestation and growth of small plants were marked during the sanction period imposed by the community. To my acknowledgment I have observed the discourse and the very essence of this phenomenon

is to balance the production against consumption. Quintessentially according to the natives, they did not sow any seed or planted trees, the Juniperus trees and other plants grew naturally and the locals only consumed what nature had produced on her own. So, the mass consumption of woods in the highland contradicted the pace of balance in growth of nature, hence the sanctions were to slow down the rate of consumption, provide a span for the organic regrowth and maintain the natural world and social world in a harmony to avoid disaster uncertainties and ambiguities.

5.2.1.3. “Yoz Chakek”

“Prushti zamana haya anen diti Bashqarik gyaw royan mari malan alawastani. Espa e wawi aih nisi tush oche trup gani he yozo chakeru birai, biko rah band hoi no wa khyo gonian kia. Hash lash biti hes sha yoz gheri sher”.

In olden times the looters via the highlands and through mountains used to intrude our land, killed our people and

looted away the resources. One of our fore great grandmothers with threshed stalks and rock salt had transformed the snow into ice, which gradually turned into glacier and blocked the mountain pass for the intruders.

This excerpt comes from a resident of village Buni, who claims to be the descendent of the earliest natives in the village. According to him, although the highland and pasture were subzero since the formative times yet there was not any glacier in above the rocky elevation, rather there used to be a mountainous pass which paved the ways for intruders to come and loot the villagers in ancient times. In the wake of those awful incidents his ancestors chose to create a blockage of ice in the route to block the intruders from killing and looting the dwellers of the village. Just like that this narrative is common across all the settlements which are settled below gigantic icy mountains in the region. Although the plot and

Figure 7

View of Buni Gole Glacier.



Note. There is a claim that this glacier is centuries old and has been created by the natives through their traditional practice of crafting glaciers, (Author, 2021).

protagonist vary along the tellers and believers, yet the nature of conflict and the method of transforming snow into glaciers remain the same.

As told and heard, people with hefty threshed stalks crumbs, rock salt and sometimes with horse buns used to withstand snow from melting and transformed it into ice. People at first identified suitable locations such as fissures and long deep ditches in the Rocky Mountains at freezing cold temperature to spread layers of stalks crumbs and salt, then accumulate snow above the layered mixture and spread layer of stalks and salt mixture above the snow, until a considerable huge amount of snow is accrued with stalk crumbs and rock salts to prevent it from melting. Gradually when it snows and sleets over the accrued snow, it transforms into ice and perpetually gains size, progressively becoming a glacier with a glacial lake underneath.

This is a conventional method utilized by the natives with readily available and easily affordable materials to create sources of water and acclimatize to the rapidly transforming world in the age of contagious global warming. In the opinion of the locals, they also used to employ this method to mend the damages in glaciers and ice sheets for perennial accretion of dry ice. This method has been disappeared from the mainstream local practices, upon asking and observing the discourse of the natives I have come to know that not lately or recently any such method has been practiced to cherish the nature and safeguard the social world. But there were rumors about employment of the method in the Arkari, a village of district Lower Chitral at the border with Afghanistan.

“Prushti hash oshoi la, ma tan tat tan lothoransum tush bare yoz qandraq biko hato etu chakaw boghdu birani. Espa kia hash kia no poshi asusi. Hen haya muxhi Arkaria kura hash kardu birani, yoz chakeru birani tan ugh kam behchaw giko”.

It prevailed in the bygone time; my father used to tell us that he had carried wheat stalk crumbs along with his elders to repair the trench in the glacier. We have not seen any

such practice in our lifetime. But yes, just recently somewhere at Arkari people have practiced this technique to accrete ice, to increase and sustain the level of useable water which had lessened.

The above response has been recorded from a respondent in his early forties, if in his lifetime he has not seen any such method then it implies long disavowal of the conventional methods, where in the lifetime of his father they had used the technique to cherish and repair the damaged ice on the dot at earliest

5.2.1.4. “Bup Dik”

Given by the social and physical settings of the area, it is known that modern technological advancement is a recent phenomenon in the region. Prior to technical accessibility tools for communication like mobile phones, media and broadcasting, the primeval techniques of communicating solely relied on conventional signs. For example, before integration in Pakistan the monarchical state of Chitral has been a subject to various foreign intruders, so at times of intrusion the message of threat was conveyed to the center using fire as sign or signal of danger. If observed closely once can still see the small stone erections at hill tops, which were built at visible distance from each other, so whenever the watchers at the border felt any threat, they used to burn woods at the hill tops. Correspondingly the watcher at hill next to the first place of fire burnt the woods at his watch duty for signaling the next in the line, by this way through signaling fire, the message of thread was conveyed to center of the state where commanding authorities took actions accordingly. Just like that, “*Bup Dik*”³³ is a technical method of conveying the message for flood threat through sound produced by blowing horn. Usually there lives a shepherd in the pastures and highlands of the settlements, who for most of the time in year except for winters stays there and technically the shepherd is the very first person to become aware of glacial outbursts and water accrued in the drainage basins. Hence whenever there were flood risks from glacial unrest and from heavy rains, the shepherd

³³ A kind of early warning system through producing loud resonating sound.

as integral to his watch duty goes to nearest place to the village where the sound produced by blown horn is potentially resounded, and audibly signals the nearest resident who further produces a sound makes the dwellers aware of the threat so that they can evacuate at earliest. The sound produced by a blowing horn is a sign of flood threat, where the horn is signifier and the sound produced is signified; giving a significant meaning to the context which is already known and agreed upon.

“Bup diko hawaz nasty u toraw oshoi na, biko espa he hawazoten loli ushtri kura wahcha xhagah boghawutam”.

The sound produced by blowing horn reached earlier than the flood, we upon hearing the sound used to run away to the safe zones.

This call from a dutiful trusted person indicates a potential threat, and conveys a message for the villagers to save their lives along with their belongings at earliest. This technique was employed as preparation and response to the risks of flood and it is a significant risk management strategy embedded in the local and traditional wisdom for managing risks of disaster like flood, especially those caused by glacial outbursts. To my observation mobile phones, and forecasts by incumbent disaster managing organizations have replaced the horns and the sound signals produced to warn the dwellers. In the majority of the areas like Buni, Reshun, Brep and Sonoghur the natives confess that they were warned before the floods by the shepherds living in their pastures, rearing their cattle, who made phone call to the locals living below in the plain lands and warned them about the floods that were yet to reach the villages destructively. Also, recently I have observed that a designated team form an incumbent NGO had installed a device in the opening of the watercourse near to the glacier at village Buni, which measures the rise in water level and signals a device installed at the hill above the village that produces alarming sound to warn the villagers about the coming threat. This new technology is just an incremented form of the traditional mean used by the natives as early warning system.

5.2.1.5. Other traditional maneuvers to prepare for floods

Ever since the primordial times, hunting has been integral to the communal practices of the region, at times it was necessary for living and others it has been a desired pastime. The people are fond of hunting migratory birds and regional or domestic birds, yet they are not hunted throughout the year but according to the seasonal calendar of their breeding, nesting and fleeing times. Thrushes like black throated thrush, song birds and chiffchaffs are not hunted in times of seasonal pollination and especial when the seeds are ripened, for they carry the pollen grains and seeds to distant places, becoming agent for afforestation. Thrush Birds are not hunted in the month of March and up till late September, for according to the prolonged observation of the natives they spread Juniperus (*Sawrooz*) seeds and seeds of other plants like Cupressus (*Sadabahar*) and Saccharum (*Shol*) in the highlands and steep slopes. This results in growth of floras and vegetation in the barren and least vegetated hills and slopy areas that basically control the overland water flows which are major contributor of flashfloods.

As the locals mostly rely on livestock to earn and feed themselves in such a harsh climatic zone, they frequently interact with the nature, especial in highland pasture to rear the cattle and feed domestic animals. Goats, sheep and bulls are usually sent to the highland pasture when summer in the region commences, natives of several villages such as the dwellers of Reshun, Brep, Meragam no 2 and Bang etc. also have pasture houses, for in the summer they get shifted to their pasture houses to rear and look after their cattle. In this meantime of rearing the cattle in highland pastures people make sure that the cattle are not grazed excessively in a single area only, but they continuously change the grazing lands to ensure that the vegetation is not consumed to an extent that they wither away. This changing strategy of grazing lands mitigates the stress laid on a single area, and provides a significant time for the vegetation to regrow and become ready to harvest until the cattle are brought back cyclically. This technique is necessarily adopted by the natives to sustain the roots and growth of greenery in the highlands, because these are the original places of the drainage basins and overland water flows, where the greenery absorbs considerable amount of the water, holds the soil with close fitting of roots and do

not let the water carry away the sand and soil, which when accumulated result into massive flood.

Before the concept of concrete erections, the nature and composition of protective walls to contain the flood in the watercourse and stream was different. The natives used to build rectangular frame of long poplar stems (*Terek*) knotted and coated with flexible shrubs to resist fast flowing water from eroding the edges of sandy lands. The protection walls, locally known as *Lambur*, are built at places which are susceptible to the over flow of water or at places where the flowing water directly hits.

Figure 8

A Traditional protection wall at the edge of water stream.



Note. Source (Author, 2021).

Now that concrete and steel are easily available the natives are no longer indulged in practicing the old methods, yet at certain irrigation channels and especially high up in the upper pastures where cements and other materials cannot be carried with no trouble, one can still get to see the conventional protective techniques to contain the flowing water in its route.

5.2.1.6. Traditional approaches to respond and retrieve

The vulnerabilities of the natives are multifaceted, the risks they are prone to are inseparable, an obliteration in one aspect of their social life inevitably affects the others. For instance, the irrigation channels in most of the villages are not only utilized for irrigation purpose only, rather they purposefully use it ignite electricity with mini hydro power stations installed in the channels. The flood destructing the water pipelines do not only create water shortage but also creates food insecurity and the roads drowned in floods cut off the region from the rest of the neighborhood for considerably huge time. I

was shocked to see the only route connecting Upper and Lower Chitral had almost reached to the edges of spiky mountains, where nearly 300 meters of plain land had eroded and washed away by the river. The only cause is flood in the village Reshun which was observed year before that had change the direction of the river and gradually it eroded the major parts of the village and the only route of transportation. Despite the multiplicity of dilemmas, present social support system in the region makes up a communal assistive structure which is entailed with knowledge-based practical techniques offered as retrieval remedies for the destruction caused by disasters like floods. “*Gram*” is social organization based on the principle of assistive reciprocity found in every village and comprises of certain limit of households who are obliged to behave in way that reduces the collective burden. “*Yardoyi*”³⁴ or sharing hands is the element of reciprocity embedded in the heart of *Gram*, similarly there also prevails the concept of “*Awlad*” which extends this reciprocal mechanism beyond the limits of *Gram*, based on the member households that are beneficiaries of same resources or events.

During the floods, when the local houses or possessions of the locals are if suppressed underneath the muddy residues of flood, the immediate neighbors and members of *Gram* to which the affected is affiliated with gather and share hand to recover what is concealed in the mud before the rested mudflow is dried and hard to excavate. This sympathetic action committed following the destruction befalls in the category of *Yardoyi* or the communal assistance, which is done without any obligation of reciprocity but with the spirit of altruism. All the affected belongings of affectees from same village organization or *Gram* are therefore retrieved by the affiliated members of that certain *Gram*. Whereas if the affected belongings are beyond the affiliations of *Gram*, for example, in most of the cases the irrigation channels are resolutely built to irrigate the farmlands many villages, hence whenever a mutual resource of more than one village are destructed during the flood, all the dutiful and rightful dwellers of the benefiting villages gather to rehabilitate the destructed channel. This phenomenal mass involvement in rehabilitation of channel is known as “*Awlado Mon*” or the duty of all, and it is mandatory for the beneficiaries to

³⁴ Reciprocal assistive system based on bonding and bridging between people in a fraternity.

attend and share their hands, if not then there are coercive measures to make it just for all the participatory village dwellers.

“Yardoyi brarginian wa dehchian muxhi boi. Awlado mon mulko boi, yardoiya no ki baw di khair awlado mona bik bo zaruri”.

Yardoi is among fraternal ties and residents of same village, whereas Awlado mon is observed at town level, one can skip Yardoyi but not Awlado mon, for it is mandatory.

Meanwhile the field work for this research I was at home in the summer and it rained for three consecutive days, the increase in water level mixed with debris caused a mud flow which destructed the irrigation channel of my village and the village adjacent to it. A relative from the village came over to my house to inform the time for communal gathering for restoring the water channel. I was tired already to join them, but my mother insisted to go there, if not for the sake of work, then to just show up and mark my presence in the gathering for my absence could have been a punishable offence and a violation to the principles of *Awlad*. I went to the site and participated as intended, the elderly people of the community were suggesting and giving advises to effectively put effort in the task and the young members dutifully put efforts to restore the channel. In times of emergencies like floods usually the mutual resources such as the irrigation channels, water pipelines and roads are toppled, hence bounded by the responsibility, beneficiaries of the resources are obliged to mark their presence and share hands in restoration of what has been damaged, particularly the male household heads. This is by nature a masculine activity, where women are least involved in the restoration tasks, yet there is minimal role of women observed. As a part of their responsibility the women cook meals and send them to the work site as refreshments for the male members at work.

Although the floods come with devastating effects, yet they come with abundance of resources for the locals. The massive mudflows raze the woodlands in the upper pastures and woods near watercourse, and bring them along while flowing into the course. The natives preparedly stand by the edge of watercourse with long sticks to scavenge the woods carried by flood. They drag the wood stems to the edge of stream with the help of long sticks which are attached to a hook like metal at the fore top. Also, when the flood is finally rested then the natives dug out the woods in the floodplains and accumulate the woods to use for conducting daily household chores, like cooking meals and for fire purpose. The local houses are usually built on stone foundations, and most the erections are observable with stones composition, especially the boundary walls. Hence the natives also gather and accrue the stones in the floodplains to make use of them in building houses or sell them to those who seek to purchase stones for building houses and others.

As mentioned, usually the natives at flood prone area are vulnerable to water shortage, which is a huge prolonged challenge face by the communities at flood risks. To cope with the water crisis and to purify water the natives dig trenches in the shadows of trees concealed with awnings, usually near to the water source to readily store and consume water. These trenches to store and filter water are called "*Sardawai*", metaphorically or as allegory the coldness and purity of water in *Sardawai* is compared to the aloofness and innocence of beloved in the local poetries. So, whenever there is shortage of drinkable water, native reach these trenches at earliest. Also, when flood is settled even though the waterflow is polluted and unconsumable, the thin, clean and neat water finds its way out somewhere near the floodplain, usually where pebbles and gravels are rested. This clean water cropping up near the flood flow is locally known as "*Sarwaliogh*"; stored in bottles and other water containers by the females and children among the dwellers, who carry it to their households to meet the water shortage with readily solution.

I have observed people offering benevolence and charity as gesture of gratitude and gratefulness when the flood is finally over. And also, the reputed pious among the dwellers calls Azaan to acknowledge the helped offered by God, as per their perceptions. These integrated practices and knowledge play a part whole in portraying the collective

behavior of the natives and reflect their perspectives and approaches to cope with the flood risks and other catastrophes.

Figure 9

A woman collecting wood remains in the residues after flood.



Note. A woman collecting twigs and wood pieces in the muddy residue remained after the flood. This is usually practiced across the region, for the region in the majority of the dwellers are from the low social income strata who cannot afford to buy firewood and gas from the market, and also the area lacks the facility of gas lines for household, source (Author, 2021).

5.2.2. Local methods to manage earthquake risks

As by nature of earthquakes, no major scientific innovations and inventions have been able to predict earthquakes prior to their occurrence. Even in the modern days, scientists are only able to locate and identify the volcanic routes and drifting tectonics plates, which

can only be purposefully used to warn settlements as located in vulnerable zones. The primeval practitioners had solitary awareness of the destructive tendencies of earthquakes, with few drills offered in response to it. Though the natives behold mythical understandings on the nature and occurrence of earthquakes, yet they have structural and non-structural remedies offered to destructive earthquakes. The structural coping mechanism is more about the adobes they have erected, which are considerably resilient to the instable movements in the surface of the earth, making it a preparatory part of the coping mechanism. While the non-structural remedies include safe site selections and actions that prevent from being a victim.

5.2.2.1. Adobes in traditions

Unlike what is recently observed, the traditional domestic spaces were concentrated with mud and wood houses, or adobes which reflected the spatial distribution of structural functions. The composition of these adobes is such that they withstand to the externalities and risk of the harsh climate and disasters like earthquake. Archetypally these adobes are erected on stone foundations, where they excavate the surface for the layouts of structure, and then build stone foundations in the ditches which are then raised up above the ground up to two to three feet. The brickwork recommences over the stone base with mud bricks, which are composed of sieved soil mud and grained with stalks or straws to increase their elastic strength. Alongside the erection of brick walls, when the foundations are laid strong wooden pillars are fixed into the surface in a manner that fashions the interior load bearing structure of the house. Usually, apart from living rooms, shed or other structures, at the epicenter of a house a multipurpose chamber is build that is where the normal house chores are conducted, fire woods are stored, dairy products, and other foods are persevered, which is also utilized as bedroom and serves as mirror signifier of the wealth a household owner possess. This particular chamber is known as “*Baipash*”³⁵, which is the most sophisticated amongst all other rooms and structures build in a household, and the local inhabitants spent majority of their time in this room. All other rooms and mud huts are in conforming resemblance with this chamber, where this chamber itself is

³⁵ Heart of a traditional adobe.

decorated with several spatial and constructive varieties, hence the structure of *Baipash* can be relied upon to generalize the assembly of all other traditional buildings. So, when after the stone foundation the brick work starts, strong wooden pillars are fixed at the edges and corners of *Baipash*, the pillars at four corners of the chamber carry long rectangular woods, fixed in way that if observed from above, they make shape of a square. To bear maximum weight, small wooden pillars are placed in between the corner Pillars to lift the load of the thick rectangular wooden boards laid over the pillars, except for the sympathy pillar in between the two corner pillars lifting the rectangular wood at the fore front. This sympathy pillar in the middle of fore front is thick in size with aesthetic decorations, locally known as “*Shero Thun*”³⁶. Then after when the height of the brick walls reaches the elevations of the pillars, small flat wooden poles and rectangular wooden boards are quadrangularly arranged and fixed over the large wooden boards settled on the pillars, this process continues until a stupa like structure is made with a hole left open in the center, known as “*Kumal*”³⁷. These wooden boards, making the roof of the structure are layered with thick sieved mud with higher concentration of straws, and dried twigs in large amount are spread over the mud layer. A huge amount of mud made of sieved soil is then mixed with stalks and straws for sealing and roofing of the structure. Thus, the adobe is mainly composed of mud, woods and stones, where woods are consumed more than any other component for building the adobe. This particular composition and decoration of the adobes increases their elastic limits and giving them the perk of compatibility with vibratory movements and swings, which make them resilient to the quakes, tremors or instable movements in the surface of the earth. Hence, at times of earthquake these adobes are to a great extent safe zones for the inhabitants, and usually when the earthquake hits, people present in a house gather at the fore front, under the withholding and withstanding strong pillar i.e., *Shero Thun* which is strongest of all the pillars. This structural remedy for the quakes is mostly relied on, for there are very few non-structural coping mechanisms which might prove significant for the locals but rationally and logically they cannot be universalized to cope with earthquake disaster in any form of disaster management.

³⁶ Strongest pillar in the house.

³⁷ Source for sunlight and ventilation.

5.2.2.2. Non-structural coping mechanisms

“Bolmuxhi ki arer no delik, lash hate xhagha dob delik, dawa nagah thor bin ki hoi falich bin boi”

When it quakes, a person should not run, rather he or she should sit down immediately, for if a person falls while running during earthquakes, he or she is then paralyzed.

There is a common belief among the natives that if a person falls during a rush for safe zone meanwhile the earth is trembling, then the person is paralyzed. Since and so far, I have not seen any such case yet this responsive belief was recurring in the interviews and group discussions I have conducted. Even, a few of the respondents claim that in their lifetime they have seen it happening. In the wake of this normalized belief, the natives observe to be content and stay steady and still during the quakes, usually in open areas. To my observation it has been an essential part of the conflict handling during the quakes, for this belief restrains the natives from creating more troubles for themselves in the pursuit of escape from the tremors.

The natives are certainly aware of the aftershocks of the earthquake, hence in form of remedy a guard amulet is tied with a thread and hanged on nail in the mid pillar at the fore front which is *Shero Thun*. Apart from their believe that the charm of this amulet safeguards their lives and property, the amulet³⁸ significantly serves to make the natives aware of the quakes, for when it shakes the amulet also swings to-and-fro indicating the earthquake even in less magnitude. Thus, the inhabitants get the chance to evacuate from the house earlier, when a movement in the amulet is observed which serves as sign of warning system for the natives. Also, when in a day the quakes occur frequently then the natives go for open grounds near the hilly areas, particularly at places where are minimum chances of landslides and free from buildings.

³⁸ Amulets serve to satisfy the natives in almost all the aspects of live, either it is a disease or a disaster, the locals lean on the charm of sacred amulets.

5.3. Natives, local wisdom and science

Despite being a subject to the waves and different phases of globalization the natives behold and own their traditions with pride and as matter of identity. Evident by the vulnerable socio-economic status of the locals it can be expected that the majority of the natives deprive modern conveniences of communications and networking, e.g., not all of the residents in the local can afford digital accessories like smart phone and television etc. And if exceptionally majority of the dwellers own modern digital accessories, then ambiguities rise in their usage, for a greater portion of the sample size, particularly the traditional knowledge practitioners are digitally illiterate. Thus, natives find the incorporation of scientific advancement with traditional knowledge as highly challenging when it comes to manage disaster risks, yet the science and its technological modernities have been effective in coping with risks induced by disasters like floods and earthquakes.

“Nogh dawro har kia jam, science tha beshi jam kia xaw, boshikar poya hanisen taten pata boyan kiawaqt wa kanduri bashir re. Espa haya tan hon giko gujur yu kori call arer hon af hai re biko espa nast ushurtam. Hash tan chaqa science o wa haya dawro khasipan ki hush korin hoi tha faida kia, khas kori espa kia rewayat kia saqafat ki sher hatosum zam korin ki hoi durdana”.

Every aspect of the modern time is appreciable, science is even much better; prior to the rains one gets to know about when and how much will it shower. Even when we observed flood, earlier than it reached the local shepherd had already informed us about the flood and thus we fled at earliest. Just like that, science and modern tactics are very productive, only if they are utilized with informed procedures, especial if it is incorporated with our traditions and culture, it will prove a golden hallmark.

The above response reflects how in a greater extent the natives rely on the scientific tactics to find an escape from the disaster calamities. To my observation technical

advancement has been effective in collective assistance and in disaster risk management, especially in conflict management and preparedness for the disasters. For instance, during the field I visited Brep village of Tehsil Mestuj, upon reaching there I saw a group of villagers were busy in excavating the residues out of the watercourse. After interacting with the villagers, I came to know that they were all mobilized and gathered by means of contacting each other through cell phones, whereas in the olden time it took a lot of time to mobilize the community members for such activities. I observed that even the village councils and organizations, such as the *Gram* is also mobilized via phone calls to gather and sit to resolve or set agendas for the communal welfare. The natives on a great deal rely on science to increase efficacy of their social assistance and coping mechanisms. Yet there are also people who account the technical advancements to the very cause for natural destructions and negation of the traditional value-oriented practices. In a village of Tehsil Torkhow I was shocked to see that the natives do not use technological informative sources like television, and are resistant to media technologies which are control and cannot be appropriated, for they consider it to be the source of obscenities and vulgarities which arouse the anger of God, thus resulting in natural disasters. Despite their resistant attitude towards controlled media and technologies, they are flexible with using technologies like cell phone and other media devices like computers, for they believe these technologies can be appropriated to the context they are living in.

I have observed that the seasonal calendar for disaster and preparedness in the local dwellings start with information provided by the media and news agencies, which timely update the weather forecasts. Also, incumbent organizations building communal resiliency to cope with disasters have identified red zones for the quakes. In a nutshell different outside information and knowledge groups have informed the locals about vulnerable hotspots and weather conditions, which in a great deal have been effective in preparing for and mitigating the disaster crises. Agencies and organizations, such as National Disaster Management Authority (NDMA) have continued to inform and equip the locals with risk management skills, admirable the agencies sent letters to various

communal hubs including mosques and large gatherings to inform greater fraction of the population about the forecasts and fore coming natural threats like climate change etc.

5.4. Subjective scrutiny

Western science and modern scientific knowledge system have long negated the spirit and significance of indigenous knowledge system based on local wisdom and traditional maneuvers. The acceptance and consideration of indigenous knowledge for contextual understanding in terms of development and growth is a recent phenomenon. It is high time to reconsider and redefine indigenously build knowledge systems to incorporate them at micro and macro level for development. Particularly, on account of contagious climatic tensions the due time for keeping social and natural worlds in harmony has come, which is nearly impossible to achieve if knowledge systems other than monolithic scientific dogmas are not taken into account for sustaining and cherishing the socio-ecological diversity across the world.

Amongst many other global tensions, disaster risk management has been the most concerned and vitally practiced across the world. The rapid phenomenal global warming and climate change has consequently affected and impacted natural resources like glaciers, water sources etc., also it has been impactful on geological phenomenon, for it has catalyzed volcanic eruptions and earthquakes. The universality of scientific methods has led to comparative negligence in the social behavior of the global inhabitants i.e., notwithstanding the global unrest in landscapes people have continuously abused the natural resources, for the hope of universality of scientific methods has unintentionally promised to fix every liability which is not in all true. The scientific risk management strategies adhered to cope with risks of disaster in one part of the world might not be at all efficient in the other parts of the world. Although scientific methods are promising in risk mitigation but they cannot be fully effective if not contextualized and incorporated with the local practices of the locale where they are applied in. Hence there is dire to consider, preserve and incorporate the local wisdom or traditional knowledge as

indigenous science to get along with scientific methods. Thus, it can enhance and inform development interventions like natural disaster risk management to make at risk communities resilient to disasters at earliest. Particularly considering the traditional wisdom at first place while intervening in developing countries for disaster risk management will not pressurize their poor infrastructure, and could be sustainable, as evident by nature of their dwellers they dwell a special place in their daily life practices for the primordial loyalties of their traditions.

Chitral in terms of its topography and people has its own unique natural and social history. The land is surrounded by ethnically heterogenous areas comparatively larger in every aspect, it dwells almost up to 17 ethnic variety yet the homogeneity of oldest known tribe i.e., the Khow tribe has managed to sustain its value oriented and ritualistic cultural embodiments throughout the known history. Historically it has remained a princely state since the reigning times of Kalash, various intruders had claimed their share and diversity of emigrants for various reasons have been observed through the history up till the soviet invasion in Afghan, when after receiving the refugees, the people had faced consequences and became resistant to the immigrants. The emigrants who fled to Chitral did not come empty handed but with their beliefs, cultures and practices which were to a degree diffused in the mainstream culture e.g., a variety in the local cuisine is reflective of the diffusion in material culture at some point of time in the history. Diffusion is integration; borrowing values, practices, rituals and cultural traits form from other culture and by appropriating them into the context, the recent Khow culture overlaps its cultural tenets with those of the other vast lands' cultures. In essence, if the Khow culture is scrutinized closely it has become a melting pot of different cultural knowledge and values, for one can clearly observe the lingual patterns of the Indo-Aryan lingual group, it has beliefs coming from Hellenic traditions, it has embedded the values of Islam, the Zoroastrian rituals and the Buddhist influences are still visible in the mainstream cultural practices. And above all the material conditions prevailing in the region and the interaction with natural landscapes has molded the culture to its adaptive capacities.

Chitral has remained a solitary biggest district of Khyber Pakhtunkhwa up until 2017 when it was divided into two separate administrative units, which are district Lower and Upper Chitral. The majority of ethnic variety remained in Lower Chitral, whereas Upper Chitral observes the presence of Khow and Wakhi tribes only, where Khow tribe is in awe-inspiring majority. The geography of Upper Chitral has restraint it from frequent exposure to the mainland diffusion, which in other sense has continued to persevere the original essence of Khow culture. Thus, the knowledge attained and observations made in Upper Chitral can serve mirror reflection of the indigenous knowledge system of the indigenous tribe.

The interactions of social and natural worlds have continued to craft knowledge system to maintain their harmony. If we look at the indigenous natural disaster risk management strategies they bespeak of the continuous interaction and exposure to the natural disasters occurring in the region ever since the primordial times. And the natives' understanding of natural disasters and remedies offered to manage them are solely based on cultural traditions and values with an inclination of religious influences. For the natives, natural disasters none other than God's resentment that is aroused by the misdeed and offensive behavior of the dwellers. Be it the floods or earthquakes, their occurrence is associated with the obscenities and vulgarities committed by the natives in their social contexts. Although the nature and understanding of obscenities and vulgarity vary along people of various spaces and various affiliations, but it can be generalized that they do not consider rational logical reasons such as global warming and maltreatment of natural resources in contemporary times. Apparently, the native associate superstitions and myths with the phenomenal occurrences of natural disasters like floods and earthquakes. These myths are in their traditions, and have been transmitted over generations regardless of the social changes in the society. For instance, the data refers to the beliefs of locals in enchantresses and evils causing the destructions, while the native believe the pious saintly elders who have religious knowledge to hold the whip for subjugating and directing these evils. Yet in their traditions of harmony and unity the natives have fair account of traditional practices to manage the disaster risks of floods and earthquakes.

The traditional model for managing flood risks starts with the folkways of anticipating floods earlier than its occurrence. Knowledge attained from prolonged and centuries old observations have equipped the natives with traditional methods to get prepared for the fore coming disaster. For example, the natives behold the locomotion of tiny creatures like insects, rodents and reptiles, an unusual movement other than their routine informs the knowledge practitioners about the hidden threat yet to come. The knowledge practitioners behold the movement of cloud and flow of wind to indicate rains causing flash floods and exercise traditional practices like *Hamal Utek* to foresee the sum of rains to be fallen in the season and thus fashion a seasonal calendar in preparation for the anticipated risks. The accuracy and precision of these knowledge-based practices are unquestionable, for they have pledge primordial fidelity with the natives, and they have been in practice since no modern of scientific approaches existed in the region.

There are also action-oriented endeavors which have been offered as response, risk mitigatory and recovery strategies for the risks posed by floods. *Tzaq* is one of the major traditional methods performed to be mitigate the chance of flashfloods and to recover the destruction caused by floods in highlands. The coercive measures for accountability and maintenance of had controlled the over consumption of resources across the region, it remained significant when they way of livelihoods were inclined with conventionality and without any intervention of modern consumerism. Now that the markets have provided diverse options for consumption at ease, method like *Tzaq* has started to disappear from the mainstream traditional practices. Only areas in the region which are lacking the choice architecture and availability of in market consumerism still continue to behold this old tradition, and that too in negligence.

Among the traditional methods for managing flood risks *Yoz Chakek* and *Bup Dik* have their significance in harmonizing the natural and social worlds of the native dwellers. It is not secret that the folktales and narratives across various spaces in the locale are referent of the olden practices to create and sustain sources of water. The natives in past were involved in practices that cherished the nature and thus got reciprocated with endless

benefits in their lifetimes i.e., the natives from various villages celebrate their own historical triumph in creating glaciers and sustaining remnants of avalanches. Although in their stories they refer to various other reasons, but the purpose of forming glaciers was to keep running the sources of water for different purposes, be water for drinking a major one of them. Unfortunately, the rate of urbanization and growing urban infrastructure have occupied the natives; busy in pursuit of surviving and living qualities lives they have abandoned their traditional knowledge heritage. Nowhere in the locale practice like *Yoz Chakek* is rehearsed currently, anyhow the knowledge essentials for forming glaciers and sustaining avalanches have not been transmitted to the next generations. The knowledge and tales of forming glaciers have stagnantly remained with the natives in their late adulthood, the younger deprive of these essentials, which might condemn the coming generations to reconsider their ancestral knowledge heritage to bring the nature into harmony. The modernism in their livelihood has either forced to abandon their practices or have increment them to a conforming degree i.e., action oriented indigenous practices like *Tzaq* and *Yoz Chakek* are nearly vanished, yet risk mitigatory practice such as *Bup Dik* has been incremented. The horns for producing resonating sound as of warning sign has been replaced by mobile phones and news media. Globalization of technologies has concurrently made it difficult and easy for the natives to maintain their traditions of unity with the nature. In essence the media and pop culture has negated the local wisdom to manage natural disaster risks before and after the catastrophes, e.g., the youth involved in hunting as sport are unaware the consequences they have created for the nature and themselves. Yet the media and technologies have found escapes out of disaster conflicts in form of giving early awareness about the forecasts and exercises to mark people and their belongings safe.

The adobes resilient to earthquakes were although significant for curbing the risks of earthquakes, yet they had their own consequences and difficulties for the natives. Particularly the amount of wood consumed to erect these adobes had pressurized the natural balance; it is nearly impossible for the people of lower income strata to purchase wood from the market so an easy way was to consume woods from woodlands and

highlands, in either case they immensely contributed to deforestation. As the winter remains for months in the region, especially in highlands, so it was difficult in the winters to shovel off the snow from the flat roofs of the adobes and to maintain them when the rains affected any portion. Hence conical houses with metal ceiling and concrete plasters have replaced the mud huts and traditional adobes, making it easy for maintenance yet vulnerable for the quakes, as for the natives cannot afford to build modern safe architected houses which come costly in the region.

The practical sphere of indigenous knowledge is dominated by males of the community, the folkways and traditions are in majority transmitted to the male members of the community. The females are restricted to certain boundaries and to household chores. This might not be the case in the very past, for in the tales of forming glaciers and scrutinizing the movement of animals to indicate threats contain the role of women. It is since the near past that the region has evolved into patriarchy rigid in nature, which has subjugated the female community members in the spheres of local wisdom and tradition in itself in the area is now referred to what the fathers have left for the generations. Young males are somehow aware of the traditional practices and the ancestral histories are deliberately narrated to them, whereas the females especially young are unaware of the indigenous knowledge heritage which had eased their lives relatively, especially at times of disasters. This indicates a huge gap in the transmission of traditional knowledge and a trend of inclination towards masculinity in the traditions.

6. Conclusion

Ever since the human societies and their social groups were established, the interaction among themselves in form of social relationships and their dealings with their surrounding landscape as of ecological relationships started to become visible in social spheres. The action oriented and philosophical social groups did not only manage to survive and balance their livelihoods, but their observations, learnings and actions extended beyond their needs for subsistence. Generations over generation have passed, societies have observed major functional shifts, and the planet earth has changed enormously, the course of social change has transformed every aspect of the social and natural worlds with respect to their adaptive capacities. The only thing which does not change by nature of its process is the knowledge system which humans have crafted. Either scientific or non-scientific, all types of knowledge have evolved from prolonged contextual, desired and undesired scrutiny of the social and natural aspects which all together form the basis for the knowledge hearth of the human societies.

Such is the case of indigenous knowledge system or the local wisdom this is effectively eminent in the domestic spaces and local spheres. Yet in the wake of scientific modernization and change in classical perspectives, scholastic communities and the predominant western scientific practitioners have long negated and contested the indigenous knowledge as under qualified. In the recent decades, scholastic communities across the world and different schools of thoughts have started debates on the inclusion of indigenous knowledge as native science for making knowledge sphere context sensitive. Particularly for development practitioners, the consideration and inclusion of local wisdom and their incorporation with development interventions has been an important trajectory for catalyzing positive growth and sustaining development, especially in developing and under developed countries.

Setting the preservation and contextualization of local wisdom or indigenous knowledge as an issue in communal development, especially in rural areas, I chose to conduct ethnographic research on indigenous knowledge system of the research arena, which is district Upper Chitral of Malakand division, Khyber Pakhtunkhwa Pakistan. And in the wake of the growing attention given to the climate change and disaster risk management,

I confined my interest to discover the natural disaster risk management practices based on the indigenous knowledge of the arena, particularly those for natural disasters like floods and earthquakes. Primarily the focus of my research rested on addressing how the natives behold natural disasters, what are their vulnerabilities, how in accordance to their primordial traditional knowledge or local wisdom they cope with this disaster, to what extent their practices are relevant and how do they see science incorporation with their indigenous knowledge. To get informed responses and reliable data, I opted participatory observation, field observation and very importantly I employed sampling techniques enforced by literature as per the nature of this research to select key informants for addressing the research questions, which are in a manner designed to resolve the recognized issue and fill the identified gap for this research.

Initially it was both easy and difficult for me to conduct this ethnography smoothly, for the setting was overt and I was already a full member of the community. Yet with the learned ethnographic techniques and tools I managed to maintain my positionality in way that it did not affect my primary findings and my ways of generalization. Despite hailing from the region, after conducting this ethnography my perspectives and understanding towards the community I live has changed. Usually, it is believed that the people of the arena or the natives I have studied are modest and innocent in nature, but I would go with the claim that people out there living amidst the mountains are still in sheer negligence. The natives behold the natural disasters as punishment granted by the supreme deity for their misdeeds, and surprisingly the misdeeds are none other than deviant behavior of individuals. The deviancies in the radical religious values and patriarchal customs are recognized as the primary reasons of resentment by the supreme deity. I did not find any response cognizant of the human actions contributing to the rise in unrests in natural landscapes, except for a few negligible responses. Although in the past, probably prior to the advent of Islam in the region, there were practices and beliefs which are attentive of the course of human actions and are informed as compared to the cognizance of the natives they behold in the present. In addition, the natives celebrate myths and fantasies when it is about understanding and controlling the natural disasters. The natives are in the

favor of involvement of supernatural deities and paranormal activities in the social spheres and natural landscapes. Usually, the tales talked about the course of floods and the tremors of earthquakes, there is an existence of a supernatural creature causing it and righteous and pious saintly man then offering remedies to these misfortunes.

As the residents of the region widely observe spatial scarcity of safe sites for residences, an overwhelming majority of the population are settled in susceptible hotspots. The vulnerabilities of the locals are their low income and spatial scarcity in the region. The remoteness of the region and rural settlements perpetually increase and recreate their vulnerabilities; they cannot afford to move outside the region, which is highly exposed natural disasters, especially the floods. The reasons they are stranded amidst the threats are their inability to afford erections which are resistant to floods and earthquakes, secondly, they take their affiliation with the land they live in as the basis for their identity. Living in a dilemma is never easy for them; although the floods and earthquakes both are potentially menacing, yet the natives fear the flood more than earthquakes and consider themselves more vulnerable to floods than earthquakes. It is because of the scarce land for residences and farming, the flood unlike the earthquake razes off the settlements, and replace the farmlands and adobes with big stones and thick impenetrable residues. Hitherto, it is also found that they consider the flooded areas as easily rehabilitated, unlike those which are eroded by river, and they observe the flood residues good for farming lands. Even though the vulnerabilities are multifaceted and vary along various spaces, yet the spatial scarcity to settle in and evacuate at times of emergencies remains a major challenge.

The natives have extraordinary traditional heritage of coping mechanisms offered to fight the threads posed by natural disasters like floods and earthquakes. Especially there are significant traditional practices offered to mitigate and manage the flood risks. The practices guided by the traditional knowledge practitioners are cyclic in nature, for instance as of early warning system “Bup Dik” was observed primordially, which is still in practice but different in nature i.e., the modern technologies like mobile phones and

signaling equipment have replaced the conventionally used horns used to produce sound as warning sign. Moreover, embedded in local wisdom the knowledge practitioners observe behaviors and movement of the animals and insects to anticipate the fore coming threat, which has served to prepare for the unknown threat coming about in the future. To verify and determine the nature of threat the weather conditions were observed and special knowledge bearer like the foreseers and fortunetellers were consulted, who also indicate the nature of threats by means of traditional knowledge. “Tzaq” as a sanction and blessing has served to prepare for and recover form the menaces of natural disasters, specially curbing the flashfloods, for the greenery and plants in the steeps contained and absorbed the rain water and did not let the buoyantly flowing rain water to accumulate in drainage basins or carry away the debris. “Yoz Chakek” is one of the significant risks mitigating traditional maneuvers to create sources of water and to repair the damages in glaciers, which essentially curbed and controlled the glacial outbursts. Traditionally it is cognized that catastrophic situations created by floods and earthquakes are collective problems and challenges, so the togetherness to share hand for rehabilitations and mitigate the collective burdens can be considered as retrieving and recovery strategies, embedded deep in the traditional system. When the recovery strategies of the natives are observed it can be said that the natural disasters particularly the flood does not only come with menaces, but also with blessings. The natives collect and accumulate the woods stuck in residues brought by flood and also, they take out the large wooden stems and trees out of the flowing flood water. Natives also gather the stones left after when the flood is settled and make use of them in building erections and other purposes.

Unlike the traditions offered to manage the risks attached with floods, there are no significant practices to cope with the menaces of earthquakes, other than the traditional adobes which are in itself dilemmatic. The traditional adobes are multi-purpose, and structurally resilient to the tremors, for the composition of their structure makes them longstanding to the earthquake tremors. The amount of wood used in these adobes offers them safe and resilient shelter for earthquakes, but it also contributes to increase their vulnerability in other way around. Since the woods used to erect these adobes are cut

down in the highlands, uprooting and deforesting these trees continuous to increase the amount of debris accumulation, the strain and stress behavior of the soil becomes unusual and it is easily carried away by the heavy rains and eroded by the floods.

To my observation and from the discourse I have seen a gap in the cognizance and practices of the natives. Looking at the ancestral traditions of the locals and their belief on the reasons for occurrence of natural disaster, I'm unhesitant to state that at some point of time this new knowledge and belief system has been integrated to the local knowledge sphere, through diffusion and exposure to the outside world. Most probably the religious conservatism, and other male-controlled cultural values have influenced the social and cultural sphere of the region; practices with sanction and other traditions of harmony prevailing in the indigenous knowledge system give minimal attention to the skins and attires of virtue and what is prohibited by the religion. Some of the beliefs, for instance the firm beliefs of the locals on morally corrupted deeds causing the disasters might have been integrate in knowledge system in the recent past, to my scrutiny even a decade earlier such nuances of actions were not a part of the mainstream perception. This gap in the theory of their knowledge and their practices indicates that the process and mode of the knowledge transmission have been altered or even hindered imposingly.

Struggling with an exposure to the fast change world around and the liquidity of diffused knowledge has somehow left these practices at the verge of extinction. The development practitioners and the educated fractions of the population are ignorant of the fact the in many ways their traditional heritage is near to collapse. The comparative negligence in their attitude has blocked the transmission of indigenous knowledge utilized for managing risks of natural disasters. Practices like Tzaq and adobes of mud can be still prevailed in the arena, yet with multiple challenges to withstand amidst the rapidly changing society. Traditional knowledge of Tzaq, Bup Dik, Hamal Utek, Yoz Chakek, and many more are unknown to a remarkable majority of people from the youth, also these practices are not practiced in their wholistic essence but are adhered to partially as suitable with who performs them. Despite these hurdles these traditions of harmony are

still relevant and are remembered as their identical heritage, handed over by their forefathers. And the natives are highly of the opinion that modern scientific knowledge should be incorporated with their tradition to achieve maximum efficiency and project the direction of growth and development in according to the methods embedded in their culture and appropriations by their local wisdom.

There are many underlying issues which are when unfolded can give a deep insight into the tenets of their knowledge system. For instance, the integration of various religious values and pop culture playing their role in influencing the traditional knowledge are when studied a closer observation of their social behavior and perceptions can be recorded. In a nutshell, then natives have plenty of traditional knowledge treasure, yet they are awaiting the practitioners to critical revive them and make use of them to purposefully preserve the knowledge and utilize them timely and needily. Thus, there is a need of historical research on how and when this knowledge was produced and regulated, what has altered their nature and how the process of transmission of the traditional knowledge has been hindered. This might be a uniqueness and matter diversified traditions for the people who are intrigued to read about the denizens of the arena, but for them it is a matter of surviving among dilemmas, hence the policy makers should inform the development practitioners to give their first attention to the indigenous knowledge system while intervening in such remote areas. Particularly the policy makers should regulate rules for the development organizations who are incumbent in the front line for disaster risk management, they should not negate the traditional knowledge, for the vulnerabilities of at-risk societies are realized by their inhabitants and known for others.

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Appendix

Figure 10

Ariel View of village Reshun District Upper Chitral.



Note. The glacial outburst and series of flashfloods in the past had blocked and changed the course of river Yarkhun, which resulted in erosion of Southern part of village Reshun and consequently eroded Mestuj road too, (Author, 2021).

Figure 11

Flashflood at village Brep has concealed the shelter of a shepherd in the locale.



Note. Source (Author, 2021).

Figure 12

Scenic view of Istor Naal, sister peak of Terichmir Hindukush Ranges.



Note. Picture taken at Donu Zom, a mountain in Hindu Raj ranges (Author, 2021).

Figure 13

View of Kosht Mulkhov from Pawasun Charun.



Note. Pawasun is a highland pasture, and summer village of the villagers from multiple villages, which are Charun, Charun Ovir and Kuragh (Author 2021).

Figure 14

A visit to Buni Gol glacier, which is claimed to be half natural i.e., the locals claim that it was created to resist the intruders and for sourcing fresh water.



Note. Source (Author, 2021).

Figure 15

Meeting with a key informant in his late adulthood.



Note. The man in the middle, Mr. Sher Baja Khan is in his late adulthood and is referred as the guide in the mountains by the locals. According to him, he has been observing and knowing the behavior of nature ever since he had accompanied his father to the highland pastures when he was just 12 years old (Author, 2021).

Glossary

Adrakh	Highland, specifically highland pasture
Alli	Duck
Awlad	Brotherhood, particularly horizontal fraternity
Awratan	Women
Baipash	The central multipurpose room in a traditional adobe

Bap	Grand father
Bolmuxhi	Earthquake
Boshik	Rain
Deh	Village
Char	Slope
Dur	House
Gaan	Wind
Ghondolik	Fresh Cones
Ghoghchawat	Insects and worms
Gram	More of a village organization for social support
Guruli	Goiter
Hamal	Referred to fertility
Halmast	Thunderbolt
Him	Snow
Hon	Flood
Hono Gor	Enchantress of the flood
Khot	Cloud
Kumal	An opening in the middle of the roof of a traditional adobe
Kulanu	Men
Lambur	Protection Wall
Lothoroan	The elders
Mon	Obligation

Mondrokhogh	Water flowing into drainage basins and streams during heavy rainfalls
Nan	Mother
Nogh	New
Paranu	Old
Peer	Saint
Rah	Way/Path
Raisht	Avalanches
Roi	People
Sardawai	A tradition method for underground water preservation
Sarwaliogh	The filtered water popping up through the pebbles due to the push by dense flood mud
Sawrooz	Juniperus
Sha Yoz	Glacier
Sha Yoz Phat Bik	Glacial outburst
Shawan	Mythical creature that protects the cattle in the highland pastures
Shero Thun	The central pillar in a traditional adobe
Shiri	Mythical creature that protects the livestock in a domestic household
Shol	Saccharum
Tat	Father
Thun	Pillar

Uru	Dead body of the offspring of mythical creature in the mountains
Waw	Grand mother
Xhaw	Son
Xhur	Daughter
Yor	Sun
Zom	Mountain