

**Changing Pattern of Spatio-Social Interrelationship of
Hunting Community in Upper Dibang Valley,
Arunachal Pradesh**

A Dissertation submitted

To

Sikkim University



In Partial Fulfilment of the Requirements for the
Degree of Master of Philosophy

By

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February 2020

Date: 07/02/2020

DECLARATION

I, **Mohan Sharma**, hereby declare that the research work embodied in the Dissertation titled **“Changing Pattern of Spatio-Social Interrelationship of Hunting Community in Upper Dibang Valley, Arunachal Pradesh”** submitted to Sikkim University for the award of the **Degree of Master of Philosophy**, is my original work. The thesis has not been submitted for any other degree of this University or any other University.

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All the assistance and help received during the course of the investigation have been duly acknowledged by him.

We recommend this thesis to be placed before the examiners for evaluation.

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“Changing Pattern of Spatio-Social Interrelationship of Hunting Community in Upper Dibang Valley, Arunachal Pradesh”

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Acknowledgements

Writing this dissertation has been long journey which begin in 2014 when I was introduced with the term wildlife conservation and Mishmi Takin by Dr. Ranjan Kumar Das. I joined Sikkim University with an enthusiasm to work in the field of Conservation, nevertheless I found no geographer working in this field. Therefore, my synopsis got rejected. At this moment, I was fortunate to meet Dr.Uttam Lal, who not only allowed me to work on it but boosted with his ideas, encouragement, guidance and support. He gave me the freedom to work independently, I am greatly thankful to him for his continued support since then. It was indeed a privilege to work under the guidance of patient and learned teacher like him. I consider myself fortunate to carry out this work under his ever-vigilant guidance and without him this thesis would not have been possible.

I take this opportunity to thank Dr.Rafiul Ahmed who taught me the meaning of conservation. “Conservation is not how the people perceive; we can't conserve species by demarcating the territory.” Dear Sir, only because of you, my approach to conserve the non-domesticated species got fabricated. Otherwise, I would have wasted my life by doing transact survey, habitat mapping, photography and accepted myself as a conservationist. It was a great privilege to have a discussion with you.

The fieldwork was not possible without the support of locals, among them my hearty and lovable thanks to my brother, Mr. Kanki Miri. Without him Dibang Valley would remain the dream project. Thank You for being in every step of my field days. I am thankful to NabaJongo Tacho and Nani Ashaya who gave me a place in their family. Nani-Naba thanks for everything. Nani Ashaya I am missing your kitchen. It was a great time with you all.

I wish to place on record my deep sense of gratitude to Naba Manmohan Mihu who provided me the data related to wildlife sanctuary. Discussions on the topics with him always helped me to clarify my doubts and raise more questions.

Next up, thanks to Naba khogo, without you the four months of my field days would have become very boring. I had a great time with you, understanding the hunters and hunting with a cup of beer. Respected Naba, lots of love to you.

Some of my greatest memories were hanging out with my friend Achili Mihu, Napi Mango, Anda Mihu, Eta Miu who assisted me in the field. Jungle safari would not become possible without you people. Achili you are the Best.

Sir Ananta Meme, Jibi Phulu ji, Ngasi Mena ji, Jando Tayu ji, Junti Miko ji your experience and analysis has guided my work through various ways.

I convey thanks from the bottom of my heart to the greatest soul of Dibang Valley among them the prominent one are: Beke Sir, Janata Umpey, Anju Di, Asinda Mipi, Nani Chami,

Aunty Di, Ram Vaiya, Naba Tamange Milli, Chacha Miu, Ayome Mihu, Navin Rondo, Naba Doro, Eco Miri, Emi Mekhola, Bachan Sahab, Dipen Molo ji, great priest Naba Emuko and Sipa who made a great contribution through various ways during my field.

I take this opportunity to thank my senior's Mr. Ajit Kumar Singha Daa and SantanuSamantaDaa for their guidance in map making. Their amazing knowledge on GIS was indeed very helpful. It would not have been possible to complete the map without them. They are the God-gifted people for me.

I thank my Sir/brother Mr. Tulsi Sharma who is the lab in-charge of the Department of Geography, Sikkim University. He has always supported me, inspired me in my work. I believe anyone can learn map making in a very short span of time under his guidance.

Thanks to Dr. Ambika Aiyadurai for talking to me and sharing her views on conservation. It was a privilege meeting you during my field study. However, I can never trust your 'five star' ma'am.

I thank my friend Arshad Ahmed, Kiran Dalvi and Previsika Rai for assisting me in various grounds.

I'm so thankful to my friend Suvechha, who always supported me for making my fieldwork and dissertation writing successful. You were the one, please send me the money, I will never return it. Friends like you are people I can depend on. You are amazing. Truckloads of thanks.

I am thankful to my brothers and sister Sanju, Kishore and Binti who have always supported me, inspired me to remain motivated. I extend my thanks to my parents who have been my constant source of support.

(Mohan Sharma)

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Abbreviations

ANT: Actor Network Theory

CBD: Convention on Biological Diversity

CHANS: Coupled Human and Natural Systems

IUCN: International Union for Conservation of Nature

ASTER: The Advanced Spaceborne Thermal Emission and Reflection Radiometer

GDEM: Global Digital Elevation Model

GPS: Global Positioning System

GIS: Geographical Information System

NASA: National Aeronautics and Space Administration

USGS: United States Geological Survey

PALSAR: The Phased Array Type L-band Synthetic Aperture Radar

PRA: Participatory Rural Appraisal

WWF: World Wide Fund for Nature

WII: Wildlife Institute of India

WTI: Wildlife Trust of India

WLS: Wildlife Sanctuary

NTCA: National Tiger Conservation Authority

DWLS: Dibang Wildlife Sanctuary

TR: Tiger Reserve

H.Q: Headquarter

BSNL: Bharat Sanchar Nigam Limited

SRP: Short Range Patrolling

LRP: Long Range Patrolling

NGO: Non-Governmental Organization

MLA: Member of Legislative Assembly

DC: District Commissioner

DFO: Divisional Forest Officer

IMES: Idu Mishmi Allied Society

IMCLS: Idu Mishmi Cultural and Literary Society

GREF: General Reserve Engineer Force

ST: Scheduled Tribe

RTI: Right to Information

MW: Megawatt

NPV: Net Present Value

CA: Compensatory Afforestation

CAT: Catchment Area Treatment Plan

LED: Light Emitting Diode

Chapter I

INTRODUCTION

The Himalayas embrace complex system of nearly parallel ranges of tertiary mountains which are one of the youngest formations and predominantly have a northwest to southeast orientation. These fold mountains, originated as a result of tectonic movements of continental plates and is believed to be growing even today. The formation of the Himalayas resulted in new barriers and corridors, which influenced the dispersal of flora and fauna. Being the meeting point of two biogeographic realms viz, the Oriental and Palaearctic, the Himalayas provides various habitats that were occupied by primitive as well as newly evolved species. Alterations in cropping patterns and development activities in the Himalayas have led to the shrinkage of much prime wildlife habitats (Vinod, 1999)

Arunachal Pradesh is mountainous, its terrain consists of lofty, haphazardly ridges that separate deep valleys and rise to the peaks of the Great Himalayas. Forest are the mainstay for the people of Arunachal Pradesh and the richest biogeographical province in Eastern Himalayan zone. The State has 20% species of country's fauna, 4500 species of flowering plants, 2400 species of pteridophytes, 23 species of conifers, 35 species of bamboos, 20 species of canes, 52 Rhododendron species & more than 500 species of orchids and is considered as one of the 12 mega diversity "Hot Spots" in the world (Balasubramanian, 2017). Arunachal Pradesh is part of Indo-Myanmar biodiversity hotspot and one of the 200 globally important eco-regions. The state is also home to 26 indigenous communities, 80% of population are primarily agriculturist using shifting cultivation (Aiyadurai, 2010).

Dibang Valley, one among the districts of Arunachal is located in the North East corner which is composed of mostly mountainous and rugged terrain. Right from the emergence of the humans in the valley, forest has played an important role and become the mainstay for the people's livelihood. The physiographic factors have rather shaped the socio-cultural activity among the Idu-Mishmi community comes under the Scheduled Tribe, inhabiting in

the Dibang Valley.

Among the Idu-Mishmi community the most or all food was obtained by foraging (collecting wild plants and pursuing wild animals). Hunting of animals and plants was the major things for livelihood and the goods for barter. It continues to support the people's livelihood and has played a significant role in the management of the ecosystem because the traditional institutions are geared in conserving the non-domesticated plants and animals. However, the government institutions and the notion of wildlife conservation contradicts with the traditional Idu-Mishmi practices and resulted a complication in the continuation of the Idu-Mishmi way of living.

It is important to document various dimensions of Human-Animal relationship in the valley. The study tries to bring forth discourses related to the hunting practices. How the cultural practices affect the animals and how animals influence the socio-cultural life of the people? In a broader sense it sets out to interrogate the emerging issues in the Valley. The study is rooted in exploring Idu-Mishmi journey between change and continuities.

I.1.(i) Placing Animals in Geography

Geography is an interdisciplinary subject. Geographers build on major emphasis in spatial analysis, human environment interactions, place based and regional based analysis to encourage communication and interaction with myriad other disciplines (Baerwald, 2010).

Research in Biogeography existed before the term biogeography. Bennett points that the field of Animal Geography is broad and overlaps several sub-disciplines. The sub-discipline of Animal Geography can be divided into four non-exclusive units, namely, a) descriptive zoogeography b) ecological zoogeography c) historical zoogeography and d) cultural zoogeography (ethno zoography). Bennett mentions that the major research in animal geography has been done by the non-geographers. The human dimensions give the geography and the geographers the most obvious reason for undertaking research in animal geography (Bennett, 1971).

Cowell and Parker highlights, biogeography embraces four fundamental themes, which are in many ways shared broadly by all of geography. First, there is a prominent focus on spatial patterns and processes, investigating the wide range of biological, physical, and cultural forces that affect the distributions of plants and animals, and reciprocally, the significant impacts of distribution on process. Second, much of biogeography emphasis landscape change, often as a result of vegetation dynamics across the range of historical time frames, from the century to geological epoch. Third, biogeographers have long addressed the human/environment interface, assessing the role of humans in modifying biotic communities, as well as analysing and informing conservation practices. Finally, much more modern biogeographic research displays a keen appreciation of linkages among physical biological elements of the environment (Cowell & Parker, 2004).

Table: I.1. **Trends in Animal Geography**

Period	Trends in Animal studies
Before 1900s	There was no boundary between geographers and other naturalist who studied animals. The arrangement of species, natural factors and distribution was studied
1900-1940	The Biogeographical issues were addressed with an approach of environmental influences on different phenomena
1940-1960	This duration accounted for the calls for quantification. Carl O Sauer introduced the concept 'Cultural ecology' which guided the animal studies
1960-1990	The resurgence of traditional biogeographic concern, incorporation of new ecological models and humans' impact on environment drew the considerable interest
From 1990	Newer trends in animal studies expanded its horizon to understand the animals through various lenses- <u>Feminism and Animal Geography</u> : The modern feministic approach extends beyond boundaries of species. It investigates the role of place in shaping human-animal interactions <u>Marxism and Animal Geography</u> : The extension of Marxian concepts like exploitation and alienation helps to highlight the social and ecological hierarchies which shift over time. Newer trend in Animal Geography comes up with the concept derived from human, social and natural sciences. It tries to couple the human as a framework to understand the Animal Geography

To place the animals into the study it is important to understand the trends of animal geography. Geographers like Cowell and Parker, Julie Urbanik and Charles H. Smith has

tried to understand the trends in animal geography. The table I.1 below illustrates trends in animal geography.

Period before 1900s: There was no boundaries between geographers and naturalist who studies animals. The work on biogeography was dominated by naturalist. The literatures speaking on biogeography can be traced through the work after the geographers like Alexander Von Humboldt who worked on botanical geography. He explained the pattern and distribution of vegetation types regulated by the climate. He was the first person to describe the human-induced climate change that he mentioned in the cosmos which is a great contribution for the beginning of biogeography (Walls, 2009).

William Swainson forwarded the theories of animal geography which were based on the distribution of animals and natural arrangements of species are discussed (Swainson, 1835).

Charles Darwin work on 'On the origin of species' by means of natural selection are some of the notable work in biogeography. Biogeography before 1990 was dominated between ecological and historical biogeography.

Period between 1900-1940: Alferd Russel Wallace who studied animal distribution across the earth surface or at regional scales. He established patterns of spatial co-variation between animals and other environmental factors. Wallace practised historical biogeography with an interest in the subject of evolution (Huggett, 2004). His views on species divergence and the theory of natural selection in general is closely tied with the distribution related matters (Smith C., 1989). He looked natural selection as being, more simply, the removal of unfit. He made a wide range of contribution to biogeography, physical geography and ethnography (Smith C., Alfred Russel Wallace, Geographer, 2010).

After Russell, a German geographer Fried Rich Ratzel came up with an idea of Animal Domestication. He primarily believed that the domestication of animals is a major part of transformation. Ratzel was a German geographer and ethnographer who coined the term 'Lebensraum' meaning 'Living Space'. His initial insight was that a social group of human

beings in many ways functions similarly to an individual, organic organism, namely seeking the necessities for life and sufficient space in which to find or produce them (Lebensraum). Ratzel's Lebensraum essay, subtitled a biogeographical study, is an early exposition of how relations between the bio and geo are politically molten. The Lebensraum essay, at moments, suggests that space is an outcome of the dynamic between life and earth (Barua, 2018).

A homogeneous approach can be seen in the work of the geographers till 1950's. It can be better understood from the book written by Ellen Churchill Semple. Broadly her book was focusing on the issues of climate, evolution history, historical similarities, society and states, migration, etc (Semple, 1911). Biogeographers kept every theme to study the animals under the umbrella of geographic factors and influences that is fundamental notion of determinism. Period between 1940-60: Biogeographers during this period started studying the plants and animals by using quantitative techniques. The vegetation and animals were studied by using different models. However, after 1950 Carl O Sauer based his study in the concept of cultural ecology. Time and change are the basic concepts in Sauer's cultural geography. He rejected evolution as a basic for the study of culture. He believed that geography should be devoted to the study of the areal facts and not in search for general principles (Solot, 1986). Sauer argues how humans influence animal population and distribution (Williams, 1987). Sauer influenced animal geography through specific and non-specific way.

Period between 1960-1990: Rise in Biology began focusing more and more on the traditional cataloguing of animal species, their distribution and evolution. The development left the geographers with an interest in animals to begin to focus more on human-animal relations in place and space (Urbanik, 2012).

The work on traditional biogeography experienced a resurgence during the late 1960 because the environmental issues became the growing part of societal agendas (Cowell & Parker, 2004). In this period the biogeographical work was based on how humans' impact

on animals.

From 1990: The discourse in studying animals in the field of geography has been drastically shifted. Geographers expanded their horizon to study the animals. The major shift took place from human centric animal geography to animal centric animal geography.

Biogeography started questioning traditional assumptions of equilibrium and predictability. Issues of human impacts focussed on the modification of disturbance processes and increasing relevance to cultural and political ecology (Cowell & Parker, 2004).

The broader shift took place from the idea derived by the feminist animal geographer. The feministic approach extends beyond boundaries of species. It highlights that the impacts on animals occur through biotic, abiotic and the combined influences (Harris, 2003) where the idea of interrelatedness lies.

The development of 'Critical Animal Studies' took place which lies between 'Sexism' and 'Specism'. Sexism questions that how animal exploitation through hunting, butchering, milk and milk production etc is gender oriented. The concept of specism emerged from the philosopher Peter singer which means giving preferences to our own species over another. Such notion developed the concept of ethical issues in the field of animal geography. Geographers started questioning about the animal rights, moral rights, and utilitarian positions of the animals. The animals were categories as a human-animal and non-human animal (Urbanik, 2012).

Such idea was largely supplemented by the Marxist idea. The concept of 'Eco-Marxism' helped the geographers to understand the ecologically destructive tendencies of capitalism. It tries to understand the socio-economic and cultural shift historically that has been applied to the study of animals that the people separate into lowly in the contemporary culture and economic production (Drake, 2015).

The British geographer Riorden in his article 'New Conservation and Geography' state that conservation practice in geography is very different from the previous conservation

philosophies. They have linked the present environment dilemma with other social problems such as war, racial strife, poverty etc are questioning the priorities by which the nations attend to their affairs and order their business (O'Riordan, 1970).

Newer trend in Animal Geography comes up with the idea taken after environmentalist, feminist and humanistic approach where the concept like eco-feminism, ethics, political ecology and the theory like Actor Network Theory (ANT) is been extensively used. This new framework tries to couple the human-nature and any non-human actors which fold the nature society dialectic in one concept. It folds the study which tries to flash the drivers (actors/actants) impacts the subject. Animal geographers in a contemporary scenario believe on the importance of coupling the human and nature. It argues that there need to find the drivers which impacts the change in small/large scale. We need to find the drivers and the role plays by it for bringing change. Animal geographers are employing ANT to investigate larger networks.

The above discussion helped to understand how the geographer has studied the animals through the changing time and reflects the shift in the contemporary animal studies in geography. This study is done by the idea derived by the contemporary animal geographers. The study carried out in the Dibang Valley district of Arunachal Pradesh.

I.2. Overview of the Literature

Mountains are the most fragile environments on earth endowed with rich biodiversity and water. Equally mountains are home to the world's most threatened and endemic species. As well it is the region provides diverse goods and services to the human society. Convention on Biological Diversity (CBD) specifically developed a programme of work on Mountain Biodiversity in 2004, which aimed at reducing the loss of mountain biological diversity at global, regional and national levels.

The Himalayas have attracted innumerable great saints and sages for prolonged meditation on its lab amid its picturesque, pious and peaceful locations by the banks of splashing and

roaring mountain rivers and rivulets. This young mountain range, the Himalayas, could be broadly divided into three regions, namely, the central Himalayas, the Western Himalayas and the Eastern Himalayas. The Eastern Himalayas include the high-rise Sierra of of Bhutan, Sikkim, Arunachal Pradesh and the other states of the north-eastern region. It is true our knowledge of the large portion of the Himalayas is far from complete (Dhar, 2006). Physiographically, the Arunachal Himalaya can be divided into three distinct belts: the foothill belt (Sub-Himalayan belt), the Lesser Himalayas and the Greater Himalayan belt with alluvial plains of the Brahmaputra to the south. These three belts are characterized by distinct lithological assemblage, regional structure pattern, fold styles and metamorphic grades. The area consists of shale, schist and conglomerates of the Himalayan system. Infact the entire state is almost wholly a rugged mountainous rivulets and mighty rivers cascading down from upper elevations. All the major rivers of the state, namely Kameng, Subansiri, Siang, Dibang, and Lohit drain almost in a north-south fashion except for Noa-Dihing and Tirap and join the Brahmaputra after entering Assam (Tripathy, 2006).

There has been quite good number of works done in these regions to understand the floral and faunal diversity. Many human and social scientist have tried to understand the cultural diversity of this region but there has been a limited work done under the framework of Animal Geography. The study will try to focus on the Idu-Mishmi and their relationship with Tigers and Takin. The available and related literatures have been categorised into three different aspects and overviewed in order to understand the nature of studies and problems.

I.2.(a) Cultural and Socio-economic Aspects

Aiyadurai make a remark that Arunachal Pradesh is one of the remote and lesser known state of India. Around 61% of the total geographical area of the state is under forests making people dependence on forests. The state has around twenty-six indigenous groups and 110 sub-groups and one of them is the Idu-Mishmi group of people in the districts of Dibang Valley, Lohit and Anjaw. In Arunachal the people's dependency on wildlife is very high.

People have strong cultural linkages with the wildlife that are closely intertwined with their local animistic religion (Aiyadurai, 2014).

Upper Dibang Valley remains rather secluded due to inaccessible terrain. Very few literatures are available which highlights on the Dibang. The Dibang Valley was largely attracted to the Britishers because the region served connectivity to the Tibet and also because of the rich biological diversity. As according to the language of literature the area was inaccessible because of the terrain and mostly the unfriendly behaviour of the people.

The colonial literatures on Idu-Mishmi are based on the Mishmi of Lohit Valley.¹ Recent decades have seen some scholars taking up study of Dibang Valley. Anthropologist and naturalist use the term Mishmi Hills² which indicates Lohit and Dibang Valley. It has been found that much of the information on Mishmi are largely based on the Mishmi of Lower Dibang Valley. The Upper Dibang is largely neglected.

Shakespeare gave an account of the origin of the Mishmi. According to him the original habitats of the Mishmi were supposed to have been the highlands of north-east Tibet. Whence with the chins they moved south, remaining in their present locality while the other people moved further and spread out (Shakespeare, 1914).

Mills gave a brief narrative of people, place and their culture. According to him Mishmi represents the early wave of migration and known to be the first migrants apparently about 500 years ago. He described Mishmi have a mongoloid feature, but some have hooked noses. In colour they vary from a strikingly pale yellow to a dark brown. They believe in spiritual goddesses named 'Maselogini' and also, they believe in sun god named 'Nani Intaya.' He also gave a very brief note on their dress, marriage, birth and death rituals. A general understanding of Idu-Mishmi can be made through his writing on the Mishmi of Lohit Valley (Mills, 1952).

1 In 1980, Dibang Valley district was split from Lohit.

2 The Mishmi Hills are located in Central Arunachal Pradesh on the Chinese side, they form the southern parts of Nying Chi prefecture in the Tibet Autonomous Region. In India, Mishmi Hills were declared as a district bifurcation of Sadiya Frontier Tract in 1948.

Mills has mentioned that Mishmi have a very primitive way of agriculture (Paku). The dependency on agriculture is rather a recent thing in the area. The tribes were food gatherers and hunters. In the later part they have started shifting way of agriculture which is known as *MupiMra* in the region. Maize (*Ambo*) and Buck Wheat is grown in the hills. Even today there are very few lands devoted to rice cultivation. When Idu use to practice shifting cultivation then they use to clear the newer land. Individuals used to move in a newer land. Today each household owns the land of their ancestor. Land near the village is more or less permanent agriculture (Mills, 1952).

The British administration in the hills had limited control over Mishmi due to their non-corporation and hostile attitude to the visitors. The strategic location of the Dibang Valley was of major interest to British frontier administration because of its proximity to Lhasa, the forbidden land (Aiyadurai, 2014). The same note was forwarded by Bailey. He narrated the difficulties he faced during his visit to the Dibang Valley. He besides mentioned about the murder of Mr. Williamson and Dr. Gregorson during their visit to the hills (Bailey, 1912).

Idu-Mishmi used to raid the neighbouring areas and practice head hunting. Chakravorty highlighted an incident which took place in 1861 and 1866, they attacked a village on the kundil, belonging to ChoukengGohain, the Khampti Chief (Chakravorty, 1964).

Mills talked about the religion of Idu-Mishmi, where he highlighted that Mishmi hill is surrounded by Hinduism and Buddhism, but in no way resembles any of it. Nor it has Tibetan influence of Buddhism nor did the Hinduism of plains have any influence on it. In a similar fashion (Bhattacharjee, 1957) talks about Father Nicholas, Michael Krick and his friend Father Bourri came with an intention to spread Christianity in the Mishmi hills but they were not successful. Which shows the isolation, and the love of culture among the tribe (Mills, 1952).

Idu-Mishmi are migrated from the Tibet and inhabiting the area since more than 500 years. People were dependent on hunting and foraging way of living. They practiced barter with

the valuable flora and fauna into Tibet in the one direction and the Brahmaputra valley of Assam in the south. The barter economy has no more remained but the people still follows the same routes to the Tibet for hunting. The culture of the Idu has always intermingled with nature and wildlife. The (culture) tradition, norms, believes, practices, folklore etc are comprised of nature and wildlife. Unquestionably the dependency level of the people to support their livelihood has been diminished with time. Although the isolation of the region still bounds the people to be largely dependent on hunting/foraging way of life. Therefore, to understand the 'Human-Nature relationship and to figure out the 'change and continuities' among the Idu-Mishmi, it is important to couple the human and Animals. The second section of the literature review deals with the Human-Animal couplings.

I.2.(b) Coupling Human and Animal: placing Tiger and Takin

In the fundamentals of Biogeography Richard John Huggett elucidated the idea of conservation. The conservation of species must go hand in hand with the conservation of communities and ecosystems. Species are part of communities and they cannot be conserved in isolation (Huggett, 2004).

Doubleday made a remark that to contextualize wildlife conservation struggles, animal geographers have grounded their work in the idea that people and animals co-construct places, landscapes and ecosystems. By viewing biodiversity and conservation landscapes as co-constructions, both can be understood as per formative structure rooted in political contexts, practical constraints, ecological processes, partial knowledge, interspecies encounters and resistance to management. The framework requires agency to be understood as part of the assemblage bound in current and historical relations among human and non-human. It suggests that the non-human poses epistemological and ontological problems for humanist and post-humanist ethics, and have linked the study of non-humans to materialist and ethological approaches to the study of society and culture (Doubleday, 2018).

Liu introduced the concept of coupled human and Natural systems. The concept focuses on

the patterns and processes that links human and natural systems. It talks about the scale; how large-scale phenomena emerge from local interactions of multiple agents in turn influence local systems. It also focuses on the complexity and surprises that how the things occur unexpectedly and also argues that there is a non-linear relationship between Human-nature couplings vary in time and space (Liu &etal, 2007).

Carter mentions that Coupled human and natural systems (CHANS) or coupled social-ecological systems are integrated and complex systems in which humans and nature interact with one another. Using combined social and environmental perspectives to understand how people and wildlife are interlinked, together with the mechanisms that may weaken or strengthen those linkages, is of utmost importance. Such integrated information is lacking (Carter &etal, 2012).

Interdependence between species is undeniable and animals are very much connected in our lives through different means (Urbanik, 2012). Highlighting the Upper Dibang Valley, people are very much connected with the nature. Historically the livelihood has been dependent upon nature. The foraging activity was the good for barter which still supports their livelihood largely.

To comprehend the Idu-Mishmi journey between the change and continuities the study of human and animal relationships will broaden the horizon. The study will be focusing on the prominent animals occupying significant position in the cultural institution of the society has beenpursued by emphasising on Tiger and Takin.

The Tiger (*Panthera tigris*) is a large and wide-ranging cat that occupies a variety of habitats, it serves as a top predator. According to the IUCN the tiger is listed as an endangered under criterion C1 because of the population of mature individuals may be fewer than 2500 individuals (Song, Smith, & Mackinnon, 2008).

Mishmi Takin (*Budorcastaxicolorortaxicolor*) is an ungulate which is found in Dibang Valley. Its distribution in China is split into two sections by the extreme northeast tip of India and

Northern Myanmar. However, there is no recent distribution data and the geographic boundary is also uncertain. Takin is distributed in China and Myanmar but Mehao wildlife sanctuary area (Dibang valley) is the place where takin can best be seen. Mishmi Takin is listed as an endangered by IUCN (Song, Smith, & Mackinnon, 2008).

Highlighting the Bhutan Takin and its range, Sharma mentioned that the Takin occurs in steep mountain forests above 1300m, with higher densities in the temperate rhododendron-bamboo-coniferous forests above 2500m. They migrate to the subalpine and alpine scrub zones up to about 4000m in summer. The preferred elevation is between 1500m and 2400m in China. The highest elevation at which takins are reported is 4200m in Bhutan, 3030m in Myanmar and 3300 in Shaanxi province in China. The lowest record in India is 700m and the highest is 4273m (Sharma &etal, 2015).

There is no adequate data that gives us information on Mishmi Takin. However, tigers have always been studied by the biologist, naturalist and people coming from different background. Besides Geographers has always tried to understand the Tigers with their own lens. At times by the economic geographers to understand the structure and agents involved in the informal trade of Tigers. Ever and again experts in GIS have tried to find out the movement data into models and visualizations. Some has kept the continuity with the classic biogeography by mapping the habitats evolution and distribution. Furthermore, the work on political ecology of tiger conservation can be seen.

The ultimate aim of the human-animal study or to be more precise the aim of study on wildlife is the conservation. Each and every species plays an equal role to bring an stability in the ecosystem. Large mammalian predators and large herbivores exert a strong influence on community structure within the diverse range of habitats they occupy, so their extirpation from an ecosystem is of grave ecological concern. Protecting wide-ranging megafauna requires talking the 'representation' approach designed for habitat conservation and adapting it to species conservation, so that we not only conserve individual populations but also the

site of the adaptations and ecological interactions associated with them.

In the context of Dibang valley Ambika Aiyadurai helps to frame the understanding of the human-animal relationship and to frame the research problem. She mentions Human-nature relations are diverse, multifaceted and often contradictory, especially the relationships with animals. Mishmi claim tigers to be their brothers and take credit for tiger protection as they observe rituals and taboos against hunting tigers. Drawing on this notion of relatedness with tigers, local residents of the Dibang Valley questions the government's plan to declare the Dibang wildlife sanctuary into Tiger reserve (Aiyadurai, 2016).

On the other hand, Takin is also an endangered species and is indigenous to the land but it is hunted and the meat is highly valued. The question arises that what kind of beliefs are set in the cultural institutions which influence the Human-Animal relationships. What is the role of the place in shaping human-animal interactions? The conception of place indicates the material and symbolic. Material includes the usage, consumption, creation as well as behaviour norms and rituals that the humans create or take part in shaping the animals. Symbolic has different forms that how animal signifies strength and determination. Some as a symbol of God, wisdom and misfortune etc.

Other animals are included in the study but not in greater detail. However, Tiger and Takin are placed as an umbrella species to see the linkages of wildlife and community there along with other animals. Tigers are placed at the top of the hunting side and Takin among the prey side.

I.2.(c) Hunting and Wildlife Conservation

The idea of this section is to understand hunting, the role of hunting and to look at how wildlife professionals/conservationist has visualised hunting and wildlife conservation.

Hunting is the master behaviour pattern of the human species. It is organizing activity which integrated the morphological, physiological, genetic and intellectual aspects of the individual human organisms and of the populations who compose our single species

(Peterle, 1977).

Askari mentioned hunting or the pursuit and killing of wild animals and games have been both a necessity and a sport since the earliest times in man's history. It was at first a necessity for the supply of food and to maintain man's existence, and then it became a sport for the well-to-do and civilized peoples and as a source of income for the common man (Askari, 1968).

Animals have been killed for a variety of reasons, and among them the slaying of tigers has ranked uppermost. In Mughal and British India tiger was hunted for prestige as well as for taking trophies. Tigers-hunting was a sport for centuries. The Mughal rulers Shahjahan and Aurangzeb made huge 'shikar' parties and killed numerous birds and animals. In colonial India the British hunter-narrators carried on with their big game hunting and proudly boasted of their skills in their books. The forest laws during the British rule also enabled these hunters to carry out their slaughter without any intervention. They often deprived the villagers and the tribal people of their basic rights in the Jungles. With the scanty remain of big game in the jungles of India the British administrations felt the need to impose shooting regulations to prolong their hunt. As a result, many prominent authors of Shikar tales started preaching the need of Conservation (Dutta, 2012).

There are many scholars who gave their views on hunting and wildlife conservation. According to Paudel the human interference in the last remaining wilderness areas has resulted in a drastic decline in population size and distribution range of many species of wildlife. However, actions aimed to minimize the effect are often launched too late, usually after species and their habitats have been seriously affected (Paudel, Hais, & Kindlmann, 2015).

A general view towards the hunting can be reflected through the writings of Gopalaswamy where he highlights that most large mammal species are threatened globally by over hunting and habitat destruction, consequent upon rapid human population growth and economic

development (Gopaldaswamy&etal, 2012).

Hunting has made ecological unsustainability. Ecological unsustainability is most simply defined in a single-species context as populations declining continuously over time, rather than populations reaching nonzero equilibrium (Coad &etal, 2013). Despite high levels of de jure protection, wildlife populations in most parks in the tropics are negatively affected by hunting. Conservation efforts have hence been considered to fail in relation to protected area management and regulating trade in wildlife products (Nielsen &etal, 2013). The rainforest rich Arunachal Pradesh, a biodiversity hotspot is an area severely affected by indigenous hunting (Aiyadurai, 2014).

Aiyadurai who is working extensively on entire north-east India and specially Arunachal Pradesh mention hunting is a serious threat to wildlife worldwide. The rainforest-rich Arunachal Pradesh, a biodiversity hotspot, is an area severely affected by indigenous hunting (Aiyadurai&etal, Wildlife hunting by indigenous tribes: a case study from Arunachal Pradesh, north-east India, 2010).

Sokos mentioned Social issues are at the root of most wildlife management challenges, and issues surrounding hunting are not exceptions. In recent decades public acceptance of hunting has decreased in many developing countries. At the same time traditional justifications for allowing regulated hunting are becoming less resonant with non-hunters, and even among wildlife professionals. The wildlife professionals from the Indian sub-continent can be cited as an example who has always stood opposing hunting (Sokos&etal, 2011).

A wide range of scholars strongly opposes hunting and mentioned that hunting is the major factor in historical decline in wildlife plus it is ecological unsustainable therefore hunting can never be acceptable.

On the other hand, there are some scholars who has reveal slight politeness towards hunting. McCorquodale made a remark that to hunters, hunting is a very cultural activity with

significant social contexts. But many conservationists believe that hunting cannot be accepted because hunting cannot support the carrying capacity of the wildlife. Such idea of conservation of species leads to come up with different approaches and methods towards conservation. Establishment of parks and sanctuaries, restricting of people entering into the protected areas. Shifting/relocation of villages has also been done to reduce the human made disturbances and to make conservation effective (McCorquodale &etal, 1977).

Conservation in the present scenario has changing its way. Government, conservationist and local people support hunting and believe that 'regulated hunting' plays a key role in wildlife conservation. Hitchcock points that hunting has played a key role in the economics and social systems of local communities in Botswana. The government of Botswana decided in 1979 to establish a Special Game License under the 'Unified Hunting Regulations'. The purpose of this special license was to guarantee rights to those people who belonged to communities that foraged for a living or who were remote area dwellers, who depended on hunting and gathering for a subsistence and income (Hitchcock &etal, 1996).

In 2006, in the United States three million hunters hunting in both public and private land. In terms of conservation they have the Sporting Conservation Council. Deer hunters in Michigan, contributing in excess of \$80 million in seasonal economic value to the hunters (Knoche&Lupi, 2012). Sport hunting is also practiced in Northern America, Germany, Italy and many more.

Sokos mentioned Social issues are at the root of most wildlife management challenges, and issues surrounding hunting are not exceptions. In recent decades public acceptance of hunting has decreased in many developing countries. At the same time traditional justifications for allowing regulated hunting are becoming less resonant with non-hunters, and even among wildlife professionals (Sokos&etal, 2011).

Bailey mentioned that in tropical rain forest carbohydrates may often be the limiting resource for human population. In such region, the diversity of animals, potentially

important sources of protein and fat is high but their biomass is low and the distribution of individual is patchy. Such visualization can be made towards Dibang Valley. Dibang is a district with a huge animal diversity and it served and still serving a great source of protein to the people who are settled with a very few in numbers (Bailey, 1912).

In India the government has banned on hunting. To great extent wildlife professionals has never accepted even the cultural/regulated hunting. Therefore, it is very much important to understand how the Mishmi cultural an institution has regulated hunting and what is the governments and wildlife professional's perceptions towards the wildlife conservation in the Upper Dibang Valley.

The above literature makes familiar with the area which highlights the society and cultural practices of the Idu-Mishmi. It gives a brief and general understanding on Human-Animal relationships and equally it focuses on the Dibang that how the foraging way of life supports people. It stresses to frame the human-animal relationship with a notion of 'co-construction'. It highlights the need of coupling between human and nature to comprehend the actors and networks which are involve in shaping human-animal relationships. This study focuses on to understand the nature and pattern of hunting, people's dependency on hunting, and the societal practices and to investigate the role of the institutions which are affecting the hunting and overall cultural practices in the area.

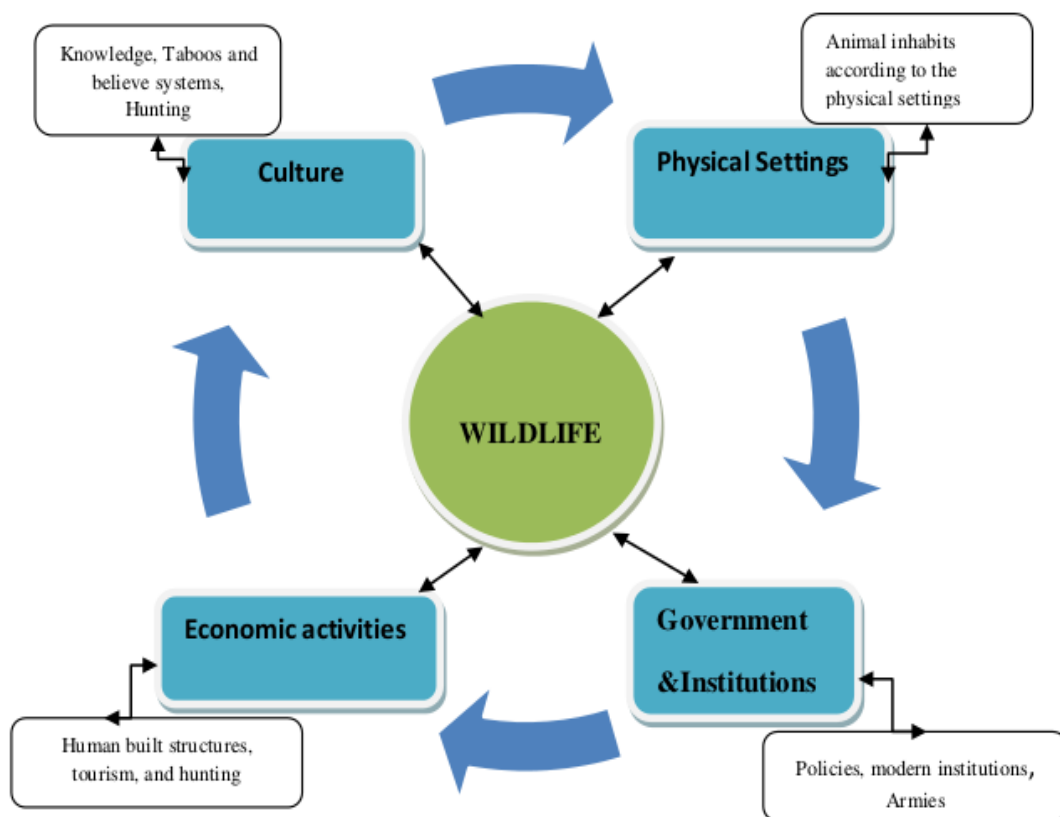
I.3. Conceptual Framework

Actor Network Theory (ANT) tries to see the practices through which the society has been transformed and put together into the present form. It argues that the human's reaction and respond with nature has not been similar to the past. It has been changing through time (Nimmo, 2011).

Allen describe that when landscape is viewed as solely a human or solely a natural construct, arrogance is the result. ANT is a viable method for studying anything in landscape, because it folds the nature-society dialectic (and space-time) into one concept.

Extending the concept, ANT aids landscape theory by demonstrating the important notion of linkages over space is time because networks are unaffected by spatio-temporal wrapping. They continue to function without regard to time or location (Allen, 2011).

Figure: I.1. **Actors and Networks**



Note: Wildlife includes plants and animals are influenced by the physical settings, culture, economic activities and government institutions the black arrows to the blue boxes indicate that. The effects co-exist among the actants which is indicated by the blue circular arrows. The black curved arrows to the boxes highlight different actants in the networks.

Actor networks should be thought of as circulation of flows where particular configurations of relations give rise to different relations of power that create and structure the world. Geographers generally employ ANT to investigate larger network, which inevitably overlook the articulations of power within single links within them (Sheehan, 2011).

ANT approach should be understood as a theory of what to study rather than an interpretative framework of the world. The methodological principle states that the researcher should include all the possible actors (natural, social, cultural, economic, local

/global). Because all these actors have a harmonic relation that affects like networks. Human and non-human both are treated as possible actors. It is a circulation of flows where one actors/actants affects another in a relational manner.

I.4. Statement of the Problem

Hunting used to be the mainstay of the food basket of the people; in due course of time it became supplementing factor of the food requirement for most of the people in the valley. While the traditional institution of hunting was geared in conserving the wildlife, the state perspective on preservation of wildlife and overall change in the valley have thrown the newer dimension in the debate of conservation of the wildlife in the area.

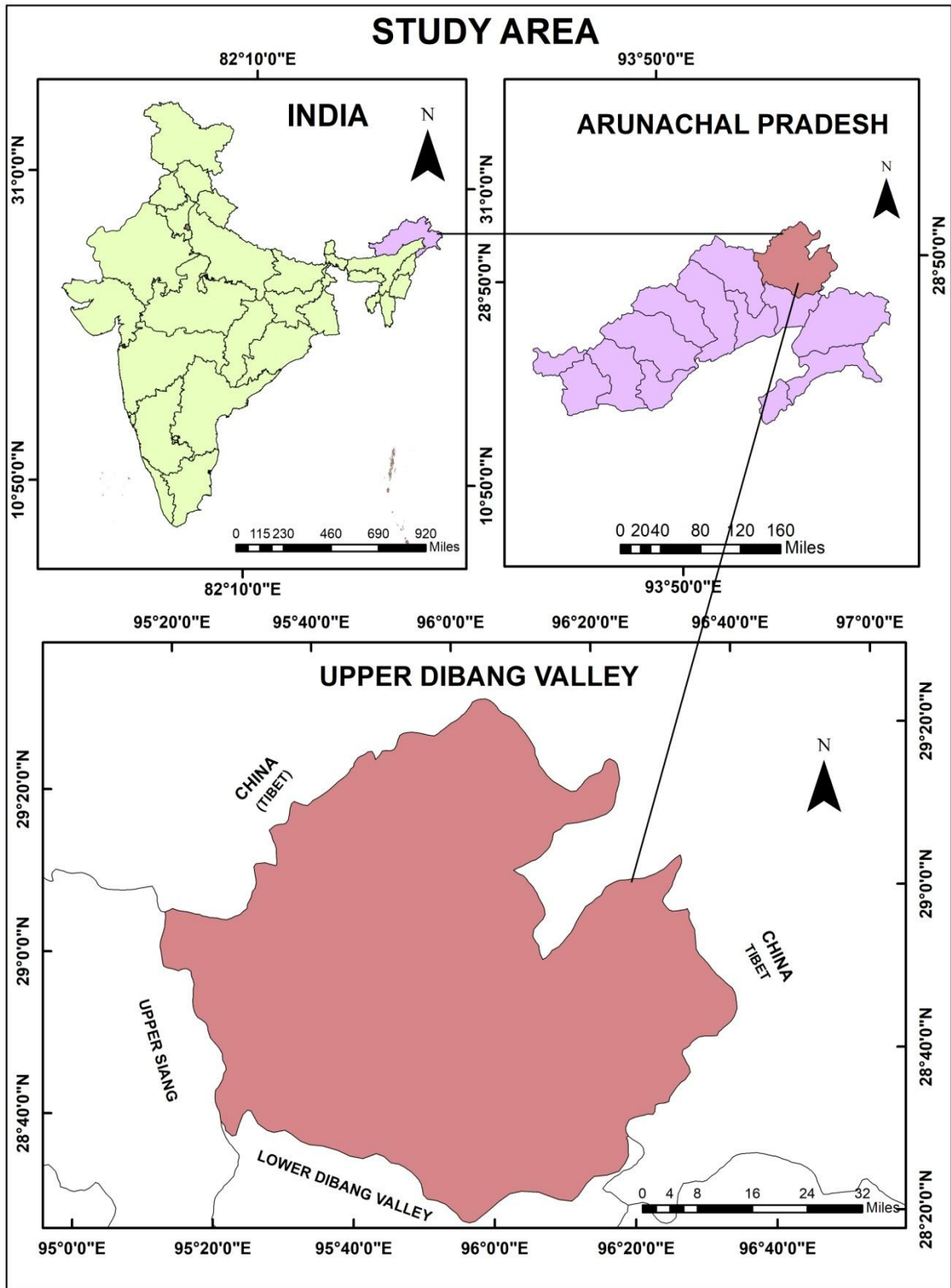
Idu-Mishmi have not been killing the wild animals and collecting plants indiscriminately. Among bigger animals, culturally they have been against tiger hunting while takins are hunted. Both the species are listed as an endangered by the International Union for Conservation of Nature and Natural Resources (IUCN). It is important to understand how the prominent animals occupy significant position in their culture.

The overview of literatures shows that there has been limited work done in the area. Modern influences are bringing newer dimension to their way of living. Thus, it is necessary to understand the complex relationship between the Nature and Society. It is prudent to interrogate the emerging issues that how long these communities can sustain the interaction with their immediate ecological settings as well as the space they occupy among the 'Conservation actors/actants'.

I.5. Study Area

Arunachal Pradesh, also known as the 'land of rising Sun', located in the north-eastern corner of India. Arunachal Pradesh covers an area of 83,743km.sq. It is bordered by Bhutan on the west, China on the north and north-east, Myanmar on the east and south-east. The Indian state of Assam and Nagaland is located in the south (Human Development Report, 2005).

Map: I.1



Source: Based on ASTER GDEM, USGS (Acquisition date 15 March 2011)

The 'Dibang Valley District' of Arunachal Pradesh. The Dibang Valley is bounded by North-West, North and East by China (Tibet), in the south by the Lower Dibang Valley. On the

west it is bounded by East Siang and Upper Siang. The Headquarter of the Upper Dibang Valley is Anini. Dibang Valley is inhabited by the Idu-Mishmi community.

According to the census 2011 the area is the least densely populated district in India with one person per sq.km. The isolation of the place bounded the people to be largely dependent on hunting/foraging way of life. Hunting has been major source of personal prestige and acquired religious footing among the Idu-Mishmi. The place is endowed with rich wildlife diversity. Generation after generation have practice hunting in the valley which still largely supports Idu-Mishmi. On first June 1980, Dibang Valley was bifurcated from Lohit district. The district was again divided on 2001 for creation of the Lower Dibang Valley district (District Statistical Handbook, 2016). Therefore, to remove the confusion, 'Dibang Valley' and 'Upper Dibang Valley' has been used interchangeably to describe the study area.

I.6. Objectives

On the basis of consulted literatures, the following objectives has been framed:

- To analyse the significance of Hunting among the Mishmi society.
- To assess the changing pattern in the hunting practices of the Upper Dibang Valley.
- To map the hunting sites and trails in the valley.

I.7. Research Questions

- What has been the role of hunting in the Mishmi livelihood?
- How has hunting shaped social institutions?
- Has there been changes in the pattern of hunting and availability of wild animals in recent years?

I.8. Data base and Methods

The study adopts a mixed methodological framework. The study looks into the changes in the socio-economic activities in the society, how does the changes impact the continuity of the traditional practices and Human-Animal relations has done through exploratory and descriptive in nature. It is an effort to comprehend the change and continuity of the socio-

economic and cultural practices in the Idu-Mishmi society. The study too focuses on Mishmi Takin and Tiger. The specific areas of presence of animals have been identified. Participatory Rural Appraisal (PRA technique) along with actor network theory is used as a methodological framework which can help to understand the various aspects of hunting and Human-Animal relationship.

Doubleday made a remark that to contextualize wildlife conservation struggles, animal geographers have grounded their work in the idea that people and animals co-construct places, landscapes and ecosystems. By viewing biodiversity and conservation landscapes as co-constructions, both can be understood as per formative structure rooted in political contexts, practical constraints, ecological processes, partial knowledge, interspecies encounters and resistance to management (Doubleday, 2018)

Geographers have contributed significantly to understanding animal role in the establishment of social-environmental classifications and boundaries. The framework requires agency to be understood as part of the assemblage bound in current and historical relations among human and non-human. It suggests that the non-human poses epistemological and ontological problems for humanist and post-humanist ethics, and have linked the study of non-humans to materialist and ethological approaches to the study of society and culture (Doubleday, 2018).

Johannesson in an Encyclopaedia of Human Geography has given a brief note on Actor Network Theory. ANT approaches the world as consisting of heterogeneous relations and practices through which humans and non-humans alike treated as possible actors. ANT has sought to highlight the frailty of the modernistic worldview and underlie how the making of society demands association of diverse elements that never exist as pure categories cut off from wider fabric of relations (Johannesson&Baerenholst, 2009).

This study employs ANT to investigate how the peoples are interacting with their immediate ecological settings. To understand the change and continuities in the hunting culture of

Dibang it is essential to understand the complexities of Human and Nature interactions.

These will enhance to understand the human wildlife interactions.

I.8.(i) Sources of secondary data

- Arunachal Pradesh Human Development Report. (2005). New Delhi. Government of India.
- District Census Handbook of Dibang Valley. (2001, 2011). Government of India.
- District Statistical Handbook. (2016). Department of Economics and Statistics. Government of Arunachal Pradesh.
- District wise statistics of Arunachal Pradesh, NITI Aayog. (2014). Government of India.
- The Red Data Book of Indian Animals. Zoological Survey of India, Calcutta.
- International Union for conservation of nature and natural resources (IUCN): Red list of Threatened species.
- Interim reports of Wildlife Institute of India, Dehradun.
- Interim reports of WWF India.
- Satellite Imageries
- Reports on Forest, wildlife and miscellaneous by the district government officials.
- Reports of Military Personnel.

I.8.(ii) Design of Primary data and sources

The primary data is collected through various means and is based as per the objectives. The first objective is to analyse the significance of hunting among the Idu-Mishmi society; it is achieved by employing two different methods, Participatory Rural Appraisal (PRA) and semi-structured interviews-

a) Local Histories: Oral histories as narrated by rural people can be rich in content to understand the changes in the Idu-Mishmi society through time. The target groups for documenting local histories were the priest, old man and hunters and the rationale behind this is that the old people used to do barter with the Tibet and Assam they have knowledge of their origin, their traditional way of living, hunting and the landscape as a whole. The history of beliefs and practices of an Idu-Mishmi community and their rationale, if any, could unravelled through interviews and discussions.

b) Semi-structured Interviews: The household survey was carried out. Open ended questions were asked to the interviewee. Semi-structured interviews were used to fulfil the first and

second objectives. The interview helped to understand the different questions related to hunting, the animals which are hunted, frequency to visit the forest, questions related to Takin and its hunting, hunting rituals and taboos and the believe systems of Idu-Mishmi society.

Table: I.2. **Sources of Data and the method employed**

Objectives	Research Questions	Methods	Sources	Targeted groups
To analyse the significance of Hunting among the Mishmi society.	1. What has been the role of hunting in the Mishmi livelihood?	PRA technique. Semi structured interviews	In-depth interviews (Local histories) Household survey	Priest/ hunters/old man and women. (Apart of active hunters the people above 40 years of age will be given much emphasis)
To assess the changing pattern in the hunting practices of the Upper Dibang Valley.	2. How has hunting shaped social institutions? 3. Has there been changes in the pattern of hunting and availability of wild animals in recent years?	PRA technique Semi-structured interviews	Local histories Participatory Mapping	Hunters/priest/women Hunters
			Direct observation method	1. For animal presence in the area through sign survey. 2. To understand the hunting structure, hunting sites, materials and methods for hunting
To map the hunting sites and trails in the valley.		GIS technique	The collected data will help to plot the hunting sites/route maps	Hunters

The second objective is to assess the changing pattern in the hunting practices of the Upper Dibang Valley that was achieved through various means:

a) In-depth-interviews (Local histories)

b) Participatory Mapping: This method helped to understand the hunting practices and the animals hunted in the area. Rural livelihoods are integrally connected with seasonality. Each season has its own problems and impact on wildlife hunting. The physical conditions influence heavily on the lives of the people. In summer (especially ungulates) moves to the high altitudinal areas but in winter because of the snow-covered mountains they are force to come down in the lower elevation. Participatory mapping technique has been used to map

the various aspects of hunting. In this technique, the villagers sketch on the map showing their routes for hunting.

c) Direct Observation Method: Direct observation method was used to comprehend two different aspects.

Firstly, to demarcate the specific areas for the animal presence and hunting sites/routes are documented by employing the direct observation method. The animals sign too was used to demarcate the presence of animal in an area. These routes are marked with the help of the Google Earth Imageries. The presence of animals has been shown roughly in the sketch.

Second, to understand the hunting structure, hunting sites, materials and methods for hunting, information on hunting rituals was documented by employing direct observation method.

d) Semi-structured interviews

I.8. (iii) Rationale behind the Selection of Villages/hunting sites

The Upper Dibang valley is geographically remote from the urban centres; Idu-Mishmi has been leading a rather isolated life. For most of the people in the Upper Dibang Valley, relative isolation from 'modern world amenities' has been rather pronounced. They often supplement their livelihood with hunting/foraging activities. In Upper Dibang people still go for hunting till the border areas of Tibet using different routes.

Villages from all the sub-districts are chosen as the source of data collection because it seemed there will be variation among the people and then socio-economic activities. The methods discussed were applied for the collection of data. Trips to jungle were made along with the villagers.

The Upper Dibang Valley has five sub-districts, the villages from all the sub districts have been chosen for the household's survey. The villages are scattered and the dependency level on forest increases with the increasing distance from district headquarter (Anini). The village which has longer distance than the district headquarter. The households are selected

on the basis of the number of houses consist in the village. 10 percent of households were selected for the village which has more than 10 houses and 50 percent of households were selected in the villages which consist of 10 or less than 10 houses.

Table: I.3.

District	Sub-districts	Villages	Sample Surveyed			
			District H.Q (distance in km)	Total Household	Total Village Population	Total nos. of household to be surveyed
Dibang Valley	Mipi	Emuli	56	13	43	2
		MipiH.Q	35	8	19	4
		Maronli	13	18	74	3
	Anini	Acheso	24	10	31	5
		Mihundo	10	13	69	2
		Gipulin	14	27	131	5
	Etalini	New Etalin	54	13	43	2
		Maliney	88	4	23	2
	Anelih	AnelihH.Q	52	64	247	10
		Model Village	91	53	225	8
	Koronli	Koronli (H.Q. Arzoo)	115	5	24	5
Total			228	929	48	

Source: Dibang Valley, District Census Handbook, 2011

I.9. Data Analysis

Certain methods are required to infer meaningful information from the acquired data. The data obtained through interviews, direct observation method and the photographs are analysed qualitatively. The sample has been depicted through table, charts and discussion.

Further, the Geographic Information System tools has been used to analyse and depict physical and cultural information's.

- Analysis of relief, slope and aspect
- Analysis of drainage
- Analysis of the map showing hunting routes and the routes to Tibet.

I.10. Limitations of the Study

- In the Dibang Valley district gets cut-off from rest of districts and other areas because several stretches of Anini-Roing road gets cut off due to the landslide.

Within the district it becomes difficult to move towards the villages because in all the major routes to villages (Dri, Mathu and Talon) was hit by the heavy rainfall and landslide. Road was blocked for many weeks. Due to this it became difficult to work in the field.

- There were nine cases of suicide recorded within the four months of the field study. Idu has a ritual, until the funeral gets over, entire village has to follow *gyeana* taboo. No one can come out of the village, no one can cross the way through the village, people cannot go to the jungle, and many such rituals are needed to be followed. During the time of funeral, it becomes difficult to do the field work.
- The sample of the study was chosen from all the sub-districts of Dibang. It was difficult to move from one location to another within a short span of time and fulfilling the task.
- From the field, field work, field notes to the thesis writing, it was a scarcity of time which became the major constraint to bring out satisfactory work.

I.11. Organisation of Chapters

Chapter I: This chapter discuss the trends in Animal Geography and the Methodological framework. Overview of literature on the study and related areas helped to frame the objectives and research questions. Sources of data, methods used for data collection and the limitations of the study have been discussed in this chapter.

Chapter II: It is important to understand the physical settings of the study area because it gives an appropriate idea on natural settings which govern the Human-Animal relationships are discussed. Hence, this chapter is supported by drainage, elevation, slope and aspect mapping.

Chapter III: This chapter has major focus on mapping the animal diversity in the Dibang Valley. It describes how hunting becomes significant in the local economy. The prominent animals which are hunted, frequency of hunting and group size of the hunters are discussed.

Chapter IV: This chapter discuss about the idea of Human-Animal co-construction in the area. It tries to connect hunting with the Idu-Mishmi culture. Relational understanding of Dibang valley has been shown. It tries to locate the idea of conservation among the Idu-Mishmi ecology and discusses the contrasting ideology on conservation.

Chapter V: This chapter has discussed about the changing pattern in the hunting practices among the Idu-Mishmi society.

Chapter VI: Finally, summary of findings and conclusion of the study has been given in this chapter.

Chapter II

PHYSICAL SETTINGS

Arunachal Pradesh, enjoys a geo-environmentally unique, sensitive and strategic location at national and global scale. The state has distinct topography, monsoon climatic regime and advantage of variation of altitude along with rich diversity in environmental conditions, flora, fauna and equally diverse culture in human space (Arunachal Pradesh Development Report, 2009).

Understanding the spatial distribution of population and what determine this distribution is fundamental to understanding the relationships between humans and the environment (Small, C., &etal, 2004). Physical settings of a region become the most important on the anthropogenic activities, especially on hunting. Hunting is connected with the natural environment and the factors associated with it. Among the factors, altitude, slope, aspect, climate, drainage, vegetation types are the prominent factors that influence hunting.

To understand hunting landscape, it is important not only to consider influencing factors that relate to biophysical environment in, such as abundance of species and logical factors, i.e., the amount required to bring home a kill, but also cultural factors, such as meat preferences, taboos, rules that control the resources, ease of accessibility etc are relational to the natural settings of an area (Read, J.M &etal, 2010).

This chapter has focused on the aspects related to the natural setting which affects the hunting ecosystem of Dibang Valley. It tries to relate hunting with the physiography, climate and the drainage system of the area.

II.1. Physiography

The Physical feature largely governs the culture and history. The society and culture are largely governed by the structure of the surface of the earth. The Himalayan range which comprises in age from Proterozoic to Holocene hence been sub-divided into three, NE-SW trending zones coinciding with three geomorphic divisions viz, the Higher and Tethys

Himalayas, the lesser Himalaya and sub-Himalaya by two major tectonic plates, the Main Central Thrust and the Main Boundary Fault (Baral, 1981).

The area is considered to be part of the Central Burmese Plate which abuts against the Indian Plate along the tiding structure and comprises of meta sediments (possibly of Pre 15 Cambrian age) which had undergone four phases of deformation and had been intruded by granites / granodiorites around 38-27 Ma and serpentinites (Kumar, 2013).

Map: II.1

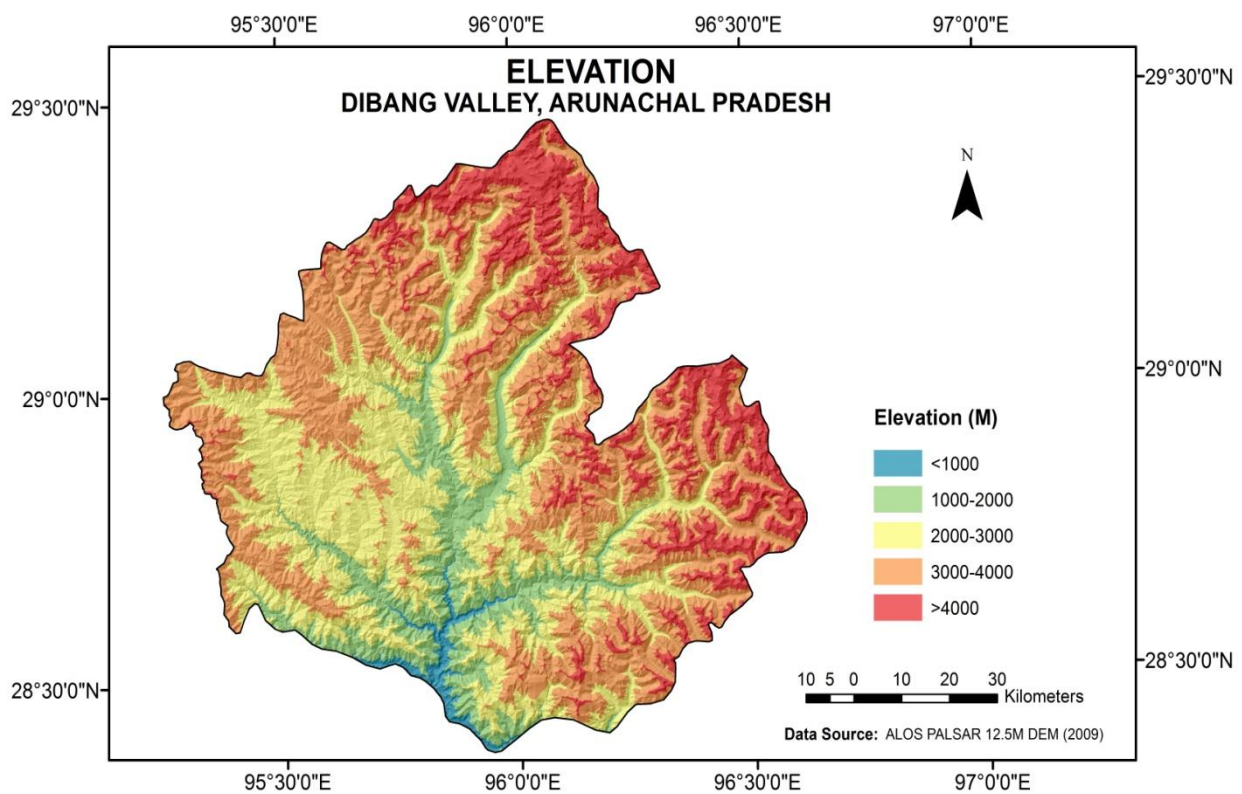


Table: II.1.

Elevation Zone to total area of Dibang Valley

Elevation Class	Area (sq.km)	Percentage of area to total area
<1000	130.92	1.42
1000-2000	1004.00	11.05
2000-3000	2762.25	30.42
3000-4000	36665.61	40.37
>4000	1516.01	16.69

Source: Retrieve from ALOS PALSAR 12.5M DEM (2009)

The district lies in the seismic zone subjected to frequent tremors. Earthquakes have been reported in 1897 and 1930. But the earthquake of 1950 was violent with high intensity resulting in avalanches, landslide and explosions that wiped out wooded and scrubby land masses, leaving behind only barren ground. The earthquake was so severe that the population of the Dibang Valley got drastically affected. A major part of Sadiya Township along with neighbouring villages was virtually shattered, leaving no trace behind (Arunachal Pradesh Development Report, 2009).

Analysis of altitudinal variation is important because it give a general understanding of the area and human settlement. Map II.1 shows the altitudinal characteristics of the Dibang Valley. Much of the area of the district falls under the high altitudinal zone. Data clearly represents that 71 percent of the area falls under 2000-4000 metre. Less percentage area has the elevation class below 1000 metre. Villages like Arzoo, Anelih, Etalin falls under the 1000 metre of elevation. It could be seen that in an average human inhabits at the height of 800-1800 metres. There are few villages that exist below 800 metre and exceed 1700 metre of elevation. The percentage of area lie beyond the elevation class of 2000m falls under the dense vegetation zone. 16.69 percent of area falls under the alpine zone.

A clear relationship with respect to altitude could establish in the area. Hunting zone ranges from 2200 to above 4000 metre of the mean sea level. Human settlement lies below 1800m but the targeted species by the hunters are found in the higher elevations. Therefore, seasonal hunting is done by the Idu-Mishmi. Long hunting trips are done in summer and shorter trips in winter. A little variation among the species is recorded which are killed by the hunters. The habitat selection of the species is based on the altitudes. Animals during winter disperse in the lower elevation zone. According to the targeted species hunters move in the jungle.

Slope and aspects play a prominent role to the human and animals' distribution. There settlement could be seen in the lower elevation areas places which have gentle slopes.

Gentle slopes are restricted to the river valleys. Aspect is orientation of the face of a slope because it controls the climate of an area.

Map: II.2

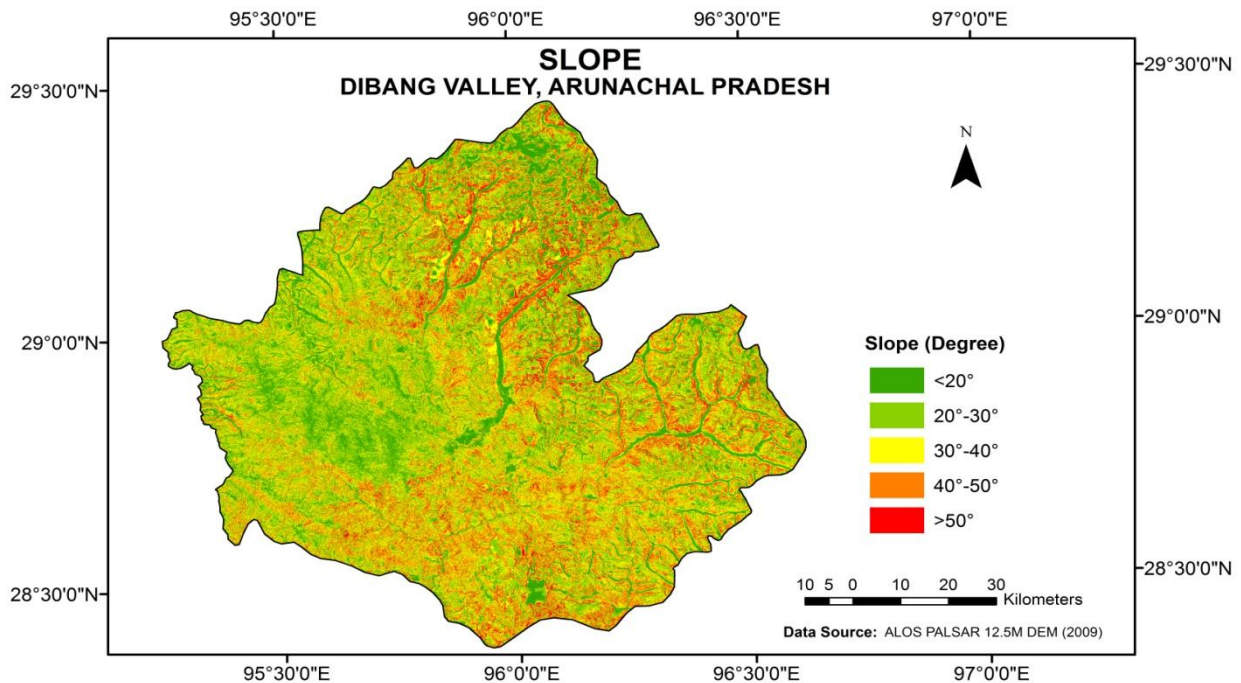


Table: II.2. Slope Area of Dibang Valley

Slope Class	Area (sq.km)	Percentage slope area to total area (%)
<20	1622.44	17.87
20-30	2501.20	27.55
30-40	2815.33	31.01
40-50	1492.65	16.44
>50	647.08	7.12

Source: Retrieve from ALOS PALSAR 12.5M DEM (2009)

Table II.3. Shows the percentage south facing slope receives more solar radiation. Therefore, human settlements are seen in the gentler slope. South facing slopes are gentler, drier, supports vegetation and soils are developed. The Map II.3. depicts that major hunting routes lies in the south facing zone. The aspect of a slope makes a strong influence on the microclimate of an area. It has control on farming, it directs in the construction of house because Idu-Mishmi make house facing the Sun.

Map: II.3.

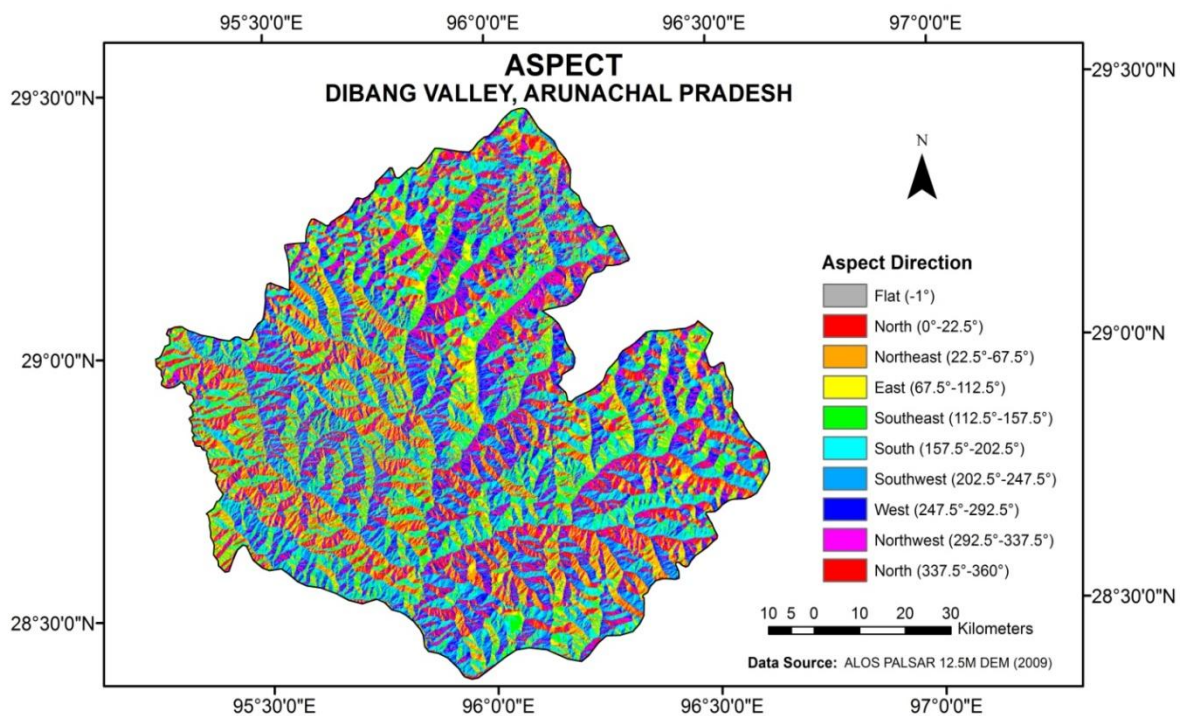


Table: II.3.

Aspect area of Dibang Valley

Aspect class	Area (sq.km)	Percentage of Aspect to total area
Flat (-1)	13.18	0.14
North (0-22.5)	592.42	6.52
Northeast (22.5-67.5)	1058.73	11.66
East (67.5-112.5)	991.33	10.91
Southeast (112.5-157.5)	1180.09	12.99
South (157.5-202.5)	1235.15	13.60
Southwest (202.5-247.5)	1334.98	14.70
West (247.5-292.5)	1085.86	11.96
Northwest (292.5-337.5)	1055.43	11.62
North (337.5-360)	531.40	5.85

Source: Retrieve from ALOS PALSAR 12.5M DEM (2009)

Slope and aspect affects the temperature, vegetation, snow packs, soil is developed according to the aspects so therefore, hunting is influenced due to the slope and aspects. Animals like Takin, Goral, Serrow and other animals which stay in the rugged terrain with steep slopes are less encountered. Therefore, the physiographic factors have a significant

influence in the socio-economic activity of the society.

II.2. Climate

There is a climate variation in the region. Dibang valley because of higher elevation it is known to have a temperate climate and the Lower Dibang Valley has a sub-tropical climate with high humidity. The temperate ranges from 15°C to 30°C in the months of March to June. The temperature gets increases when we come towards low belt areas of the district. The temperature falls below freezing point during extremely cold period. There is a pleasant summer and a chilling winter in the higher elevation region in the Dibang Valley (Census of India, 2011).

The extreme variation of climate within Arunachal as a whole has been more a blessing than disadvantage because the micro level agro-climatic conditions are congenial for growth of diverse crops that suit the different climatic requirement in the same season in different agro-ecological zones. Arunachal Pradesh being a hilly state with deep valleys and high mountain peaks traversed by number of rivers and rivulets, has varying agro-climatic zones which can broadly be classified as:

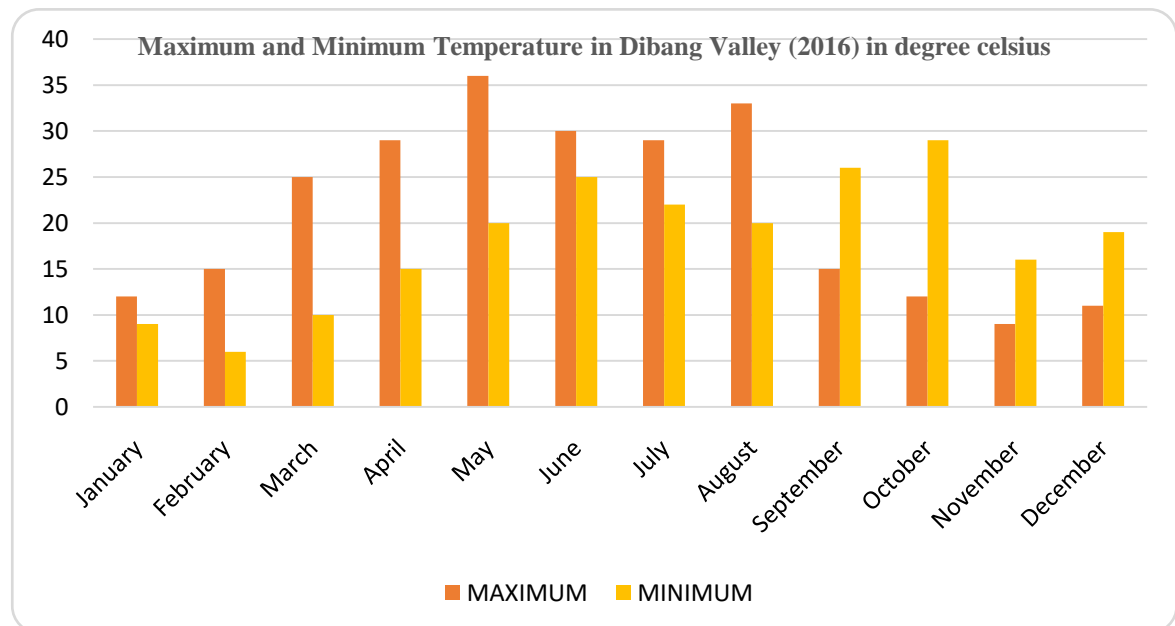
1. **Tropical zone:** With high rain-fall and humidity, warm temperature ranges from 22-36 degree C in summer and 10-25 degree C in winter. The elevation ranges 80-900m MSL (mean sea level).
2. **Sub-tropical zone:** With moderate rain-fall and humidity, cool temperature ranges from 15-30 degree C in summer and 14-21 degree C in winter. The elevation range: 900-1,800 m MSL. This zone experiences less rain fall, partially dry zones in the inner Himalayas.
3. **Temperate zone:** With less rain-fall, cool temperature is ranging from 0-22 degree Celsius. The elevation ranges from 1,800 m to 2,500 m MSL.
4. **Alpine zone:** Essentially cool temperature ranging from 0-20 degree Celsius with

snow-fall and elevation above 2,500 m MSL.³

Severe winter is experienced in Dibang valley from November to March when snowfalls becomes quite frequent. During this period, particularly between December and February, the temperature goes down to sub-zero level. Pre-monsoon prevails during April to May and is followed monsoon season during June to October. In this area, the south-west monsoon is the main contributor of about 50% of the total annual rainfall, the average of which is around 400 mm (S.Dasgupta&etal, 1997).

The climate of Dibang Valley is mainly influenced by orography. It is sub-tropical, wet and highly humid in nature in the foothills and cold in the higher elevations, ranging to freezing point during extremely cold period. In an average human settlement in the district exist between 700-1700 metre above mean sea level. The socio-economic activity is controlled by the climatic factors, where temperature and precipitation are the fundamental measurement for describing the climate.

Figure: II.1.



Source: District Statistical Handbook (2016). Government of India

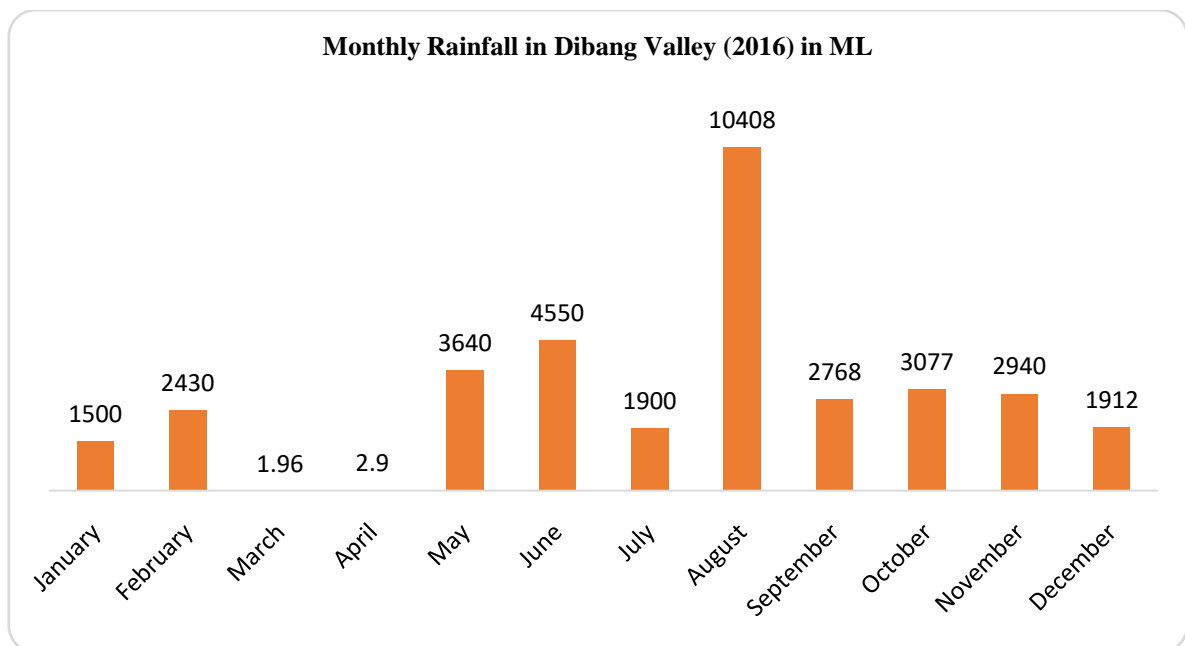
Figure II.1 shows the data which were collected from the district headquarter, Anini which

3 (<https://www.thisismyindia.com/arnachal-pradesh/arnachal-pradesh-climate.html>) Accessed on: 21/11/2019)

is situated at 1600 metre. Data from other areas are unavailable; there a general understanding of temperature of the district can be understood from the above data. Data shows that January is the coldest month in the area. Temperature falls from 12 to 9 Celsius. In the higher altitude's temperature remain in minus. Summer is warm in Anini where temperature varies from 25-36 degree Celsius. May record the highest temperature in the year 2016.

Figure II.2 shows that Dibang Valley receives rainfall throughout the year. August receives the highest amount of rainfall (10408 ml). May, June, July and August are the month the area faces excessive amount of rainfall. During winter the higher altitudinal zone receives precipitation in terms of snow. Mountain gets filled with the thick layer of snow in winter. March and April are the month where the area receives scanty amount of rainfall (1.96 and 2.9 ml). The data clearly shows Dibang Valley receives an adequate amount of rainfall.

Figure: II.2



Source: District Statistical Handbook (2016). Government of India

Climatic factors have controlled the human activity in Dibang Valley. Seasonal factor plays a prominent role in the movement of people. It has been known through the above data that summer receives a huge amount of rainfall. The rainfall brings the landslide, results in the damage of roads. Every year for a quite longer period of time the road connectivity get

shatter. Anini gets disconnect with Roing town in the Lower Dibang Valley for a long period of time. During this time people gets dependent on locally available resources for the purpose of consumption.

Hunting in the area is wholly guided by the season. During summer hunters go to the high altitudinal areas for hunting. They stay in the alpine areas in search of Himalayan Musk Deer, Takin and other high altitudinal species are hunted during this time. Alpine ecosystems and the plant and animal populations living therein are potentially vulnerable to climatic and environmental changes (Viterbi, R &etal, 2015). In winter the temperature gets lower. From September the alpine and sub-alpine vegetation starts getting yellow due to the low temperature. Slowly the mountains get filled with the snow. Thus, the movement of people gets controlled by the climatic factors. Climate has equal control upon the non-domesticated species. Animals too migrate in the lower elevation areas out of the scarcity of food due to the snow-covered mountains.

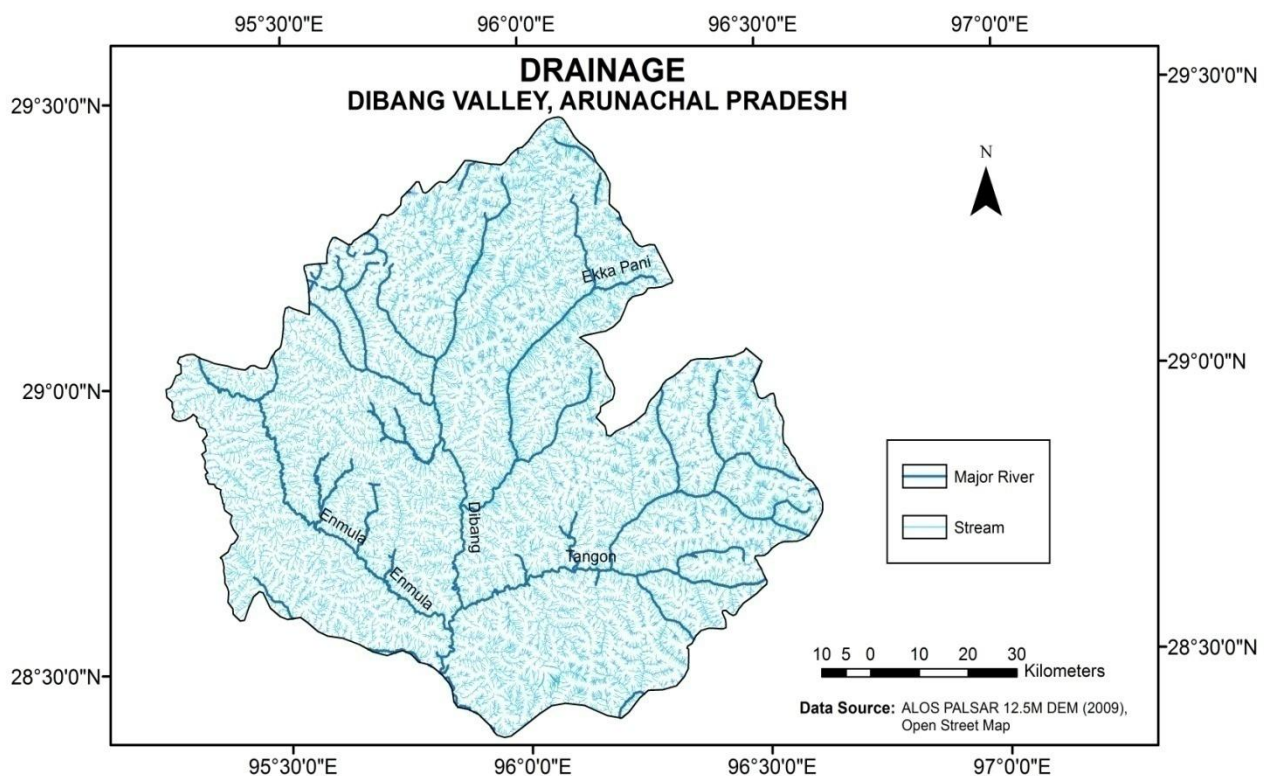
II.3. Drainage

The river system of the district is a part of the Brahmaputra River Basin. The main river of the district is the Dibang River. The confluence of Mathu river is in the west and Dri river is on the east. Both the rivers originating in the Tibetan Plateau takes the name of Dibang River. There are numerous southerly flowing small rivers and streams, tributaries to the Dibang river, except the Ihipani river which flows from west to east at the base of hill, north of Roing. The overall drainage pattern of the district is dendritic to sub-parallel. In the northern mountainous part, it is mostly of dendritic nature (Census of India, 2011).

In the valleys of the foothills area, it is sub-parallel flowing from north to south. The streams and nallas are of losing nature in the piedmont zone and the reappearance of these rivers is observed towards southern part of the district. The rivers flow through the heart of Dibang Valley and Lower Dibang Valley district in north-south direction and divides Dambuk and Roing Circle before it finally merges with Brahmaputra. Beside Dibang River, Emme, Eje

and Deopani in north-east to south-west direction and Aba nalah and Enjunalah north-south direction are found in Roing Circle. Sissiri River is an important river flowing north-south in Dambuk Circle. Sina Nallah and Ewado Nallah merged with Sissiri river and finally merged with Lohit river. Ithun river along with smaller streams like IthiPani, Enno Pani, Ena nallah and ChoppoMachi nourishes Hunli and Desali circle. Emme river originates from Hunli circle and flows through Roing circle. Difu river, Hetzu river and ChiyuPani forms the river system in Koronu circle flowing in north-south direction and lastly merged with Lohit river (Census of India, 2011).

Map: II.4



Following are the major river valleys of the Dibang Valley:

(i) Dri-Matun River Valley: The valley is a part of the inner Himalayas and lies in the northern most part of the district. It is a combined valley of two rivers – the Dri River and

the Matun River. The population of this region is found to be concentrated only in the areas of the lower course of the Dri-river and its tributary the Matun River. The region spread over the administrative circles of Anini and Mipi. The soils of the area are high base status soils of humid regions, shallow black, brown and alluvial soils of northern regions, recently formed soils, high base status soils (Hydromorphic) and alluvial soils (recent alluvium). The entire region is covered by east Himalayan moist temperate forest. The northern most and eastern most portion of the valley are snow – clad areas.

(ii) Emra River Valley: The northern portion of the region is a part of inner Himalayas and the southern portion that of the Middle Himalayas. The region spreads over the western parts of Etalin circle and a very small portion of Anelih circle. The soils of the area are high base status soils of humid regions, shallow black, brown and alluvial soils of northern regions, recently formed soils, alluvial soils (recent alluvium) and high base status soils. (Hydromorphic). There are two types of forest in the region. The northern portion of the valley is covered by East Himalayan moist temperate forest and the southern portion by the tropical semi-evergreen forest. The area is considered as a remote as it does not have any communication. The northern most portion of the area is snow clad lying along the Macmohan line.

(iii) Tangon River Valley: The valley lies in the inner and Middle Himalayas. It covers the area drained by Tangon River and its tributaries which is the eastern part of Etalin circle. The easternmost portion of the region is covered with snow (Census of India, 2011).

River plays an important role in the human habitation. In Dibang Valley human settlement is followed by the river valleys. It equally influences the hunting. There are three major hunting routes to Tibet which follows the river. The major routes get dispersed in a smaller track towards the streams and tributaries. During summer animals use to stay in the higher altitudes but particularly in winter they get scattered into the lower elevation areas. Hunters use to wait for the animals in the waterholes. Hunting during the winter use to take place in

the waterholes when animals come to drink the water and the saltlicks. Hunters too set their base camps in the jungle targeting the water sources. Human settlement, animal distribution and hunting is largely influenced by the river systems in the area. River is the source for fishing and all the wildlife are dependent on rivers so the kill sites along the rivers are evident.

II.4. The Forest

The region is endowed with Sub-tropical climate with adequate rainfall. The excessive rainfall, temperature and humidity have blessed the area with luxuriant vegetation which is typical of the tropics. The luxurious growth is mostly situated in the hilly region and on the valley in between the hills. It has extended up to the river bank in the plains. The soil supports luxuriant vegetation with wide range of bio-diversity. The forest is heterogeneous with variety of tree species rich in biota. Due to repeated practice of slash and burn cultivation, vegetation has virtually replaced the original crop (Arunachal Pradesh Development Report, 2009).

The Vegetation type can be broadly group as – a) Tropical forest (b) Sub-tropical forest (c) Temperate forest (d) Sub-alpine forest (e) Alpine forest. Forest found in the tract can be broadly classified into the following types as per Champion and Seth's classification of forest types of India.

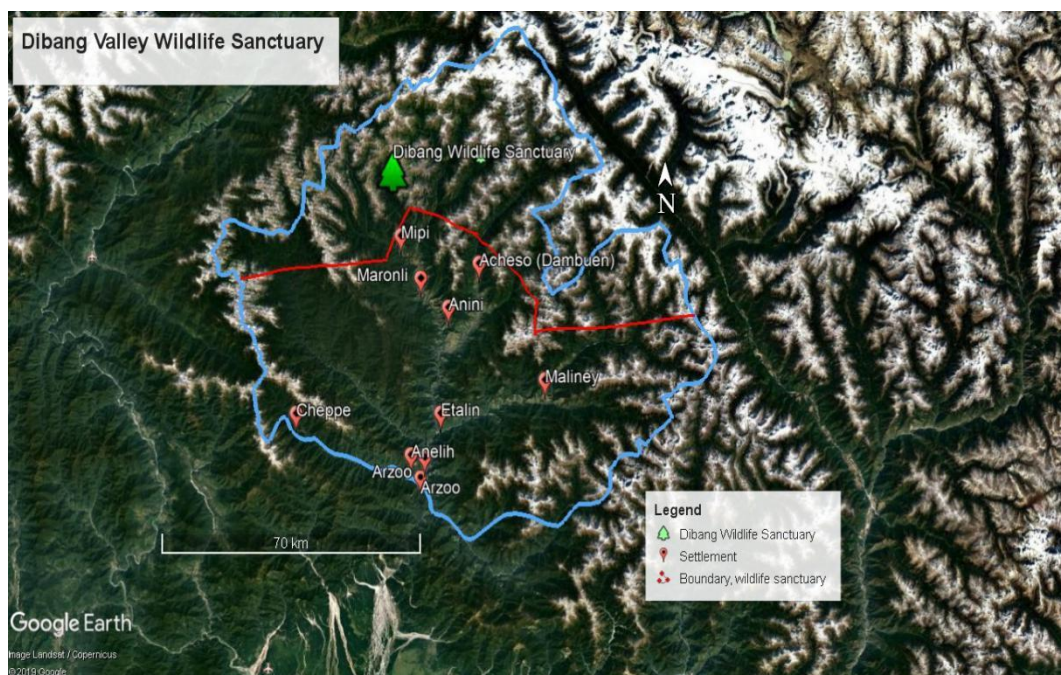
- Sub-Himalayan light alluvial Semi-evergreen forest.
- Eastern alluvial secondary Semi-evergreen forest.
- Low alluvial Savannah Woodland.
- Eastern Hillock forest.

The flora of Dibang Valley is rich and diverse in species composition. It supports several endemics that have evolved locally or have survived only because of protective natural barriers against the invaders. The tribal population inhabiting the Dibang Valley with their indigenous skill are closely associated with plant growing over the wide geographical

region. They use the plants in their different proportion in their daily life.

The forest preserved area of Dibang Valley District is mostly situated in the hilly region and extending up to the river bank of the plain. The forest activities were first introduced in Arunachal Pradesh in 1946 for protection, afforestation and exploitation of forest. Forest wealth plays a vital role from the economic point of view. The important tree species in the region includes Hollock, Khokan, Mekai, Simul, Titachampa, Gamari. The bamboo of the variety is found in abundance (Arunachal Pradesh Development Report, 2009).

Map: II.5.



Source: Imageries, Google Earth Pro

The forest area is managed under the Assam Forest Regulation of 1982 along with Indian Forest Manual of 1990 under which people of Arunachal Pradesh has been given special privilege to collect Timber and other forest products like cane, bamboo, tatch, boulder is allowed free of royalty for their own use. People enjoy privilege for hunting, fishing and trapping etc. Dibang Valley is well known for its floral and faunal diversity. The region has a largest thick green forest with almost 80 percent of the area being notified as reserved forest, wildlife sanctuaries or unclassified state forests (Arunachal Pradesh Development Report, 2009).

The district has a wildlife Sanctuary as shown in map III.5. Dibang Valley Wildlife

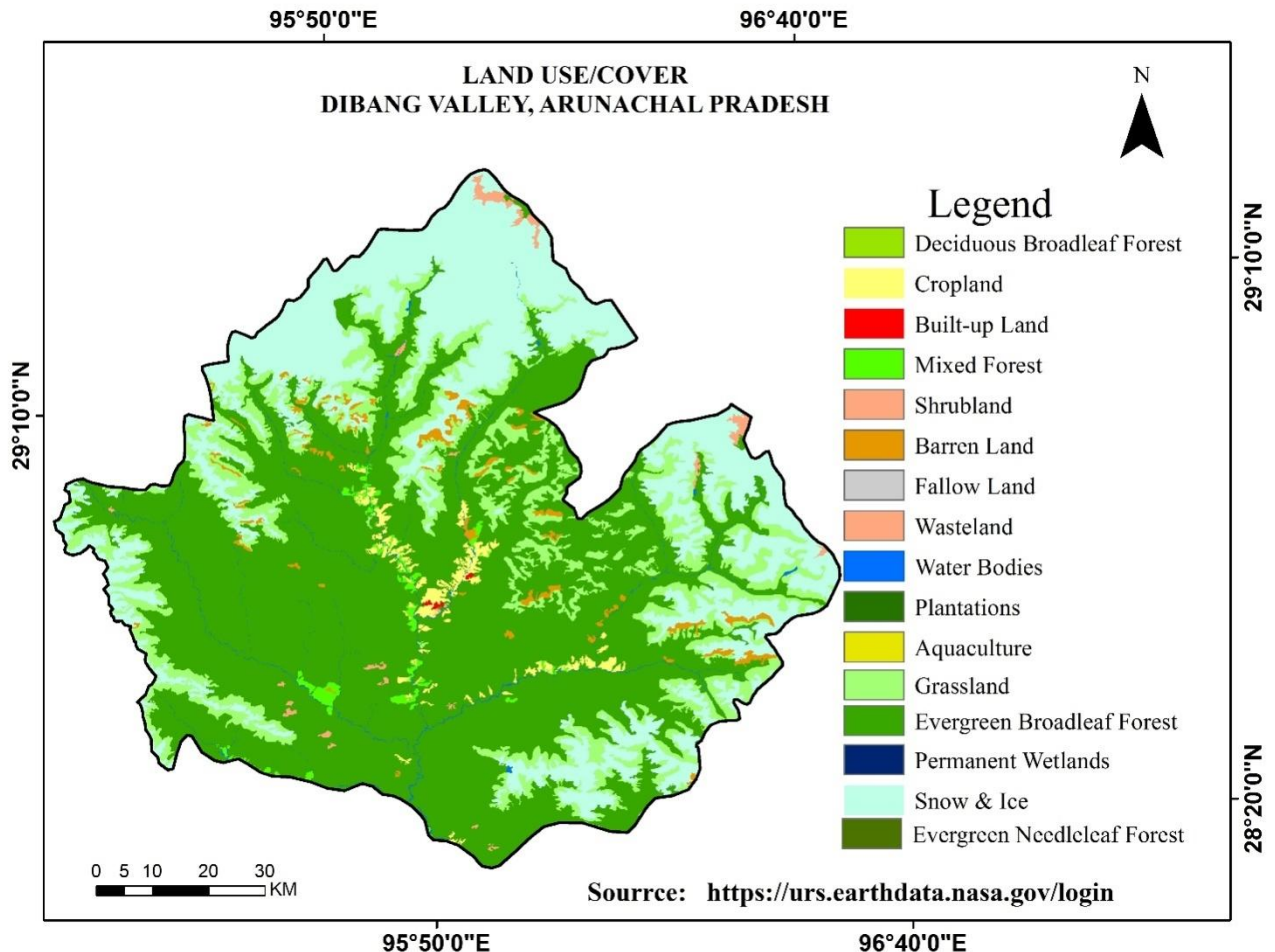
Sanctuary covers an area of 4149 sq.km. The sanctuary was created in 1998. However, for the locals it is their traditional land and the land till the border areas belong to the Idu-Mishmi. The sanctuary area is the source of livelihood for the local. People enter into the forest; they hunt and collect the valuable plants and animals.

II.5. Cultural settings and Hunting

The above discussions revealed that the land use practice of the Dibang Valley is closely linked with the natural settings of the area where the topography, climatic conditions and other socio-economic practices plays a major role. The region is endowed with the lush green tropical, subtropical, temperate coniferous as well as broad leaved forests. Approximately fifty percent of known flowering plants are reported from India are found in this region (Singh, T.P. & etal, 2003). The settlement pattern, practice of agriculture, movement of the people in the area is according to the physical factors.

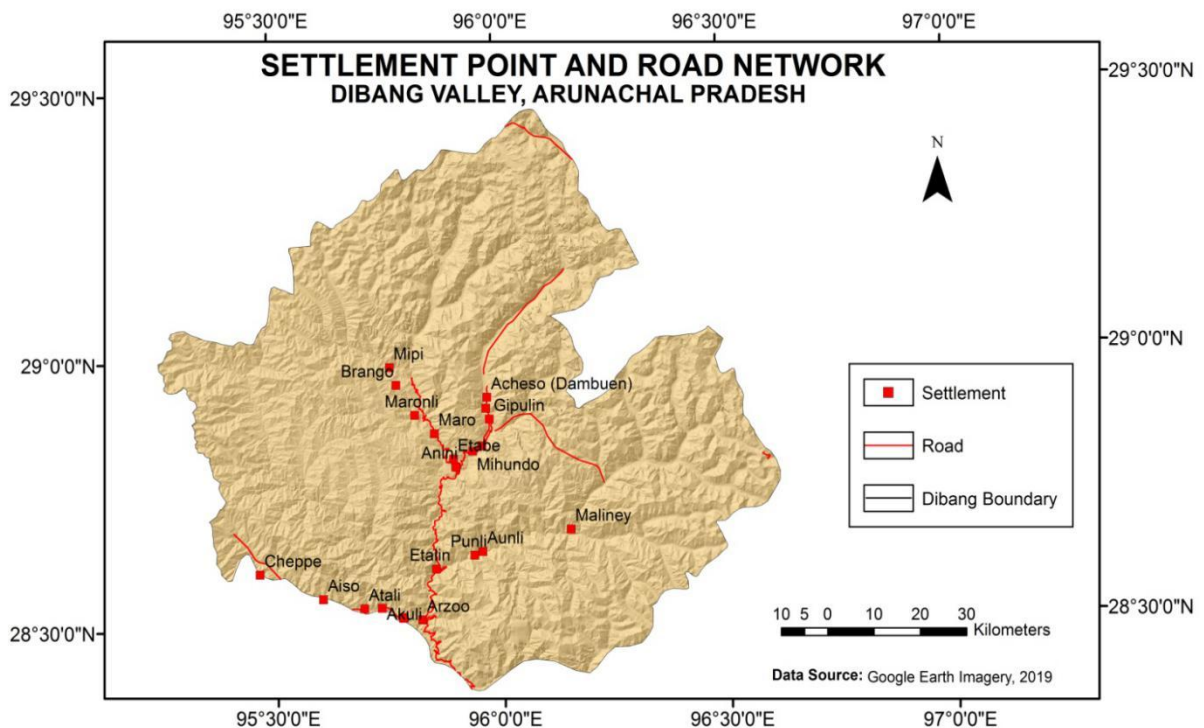
Map: II.6.

Landuse and Landcover of Dibang Valley



Landuse and Land Cover map shows that the villages and crop land are located in the lower elevation areas. The area is criss-crossed with the river valleys. Evergreen broad leaf forests dominate the area. The animal diversity is higher in this zone. The elevation increases with the increasing distance. Therefore, the higher elevation areas are covered with the snow. The food, water, raw materials, environmental systems and cultural values makes a ecosystem which have a direct and indirect impact upon each other. Ecosystem is directly affected by changes in landuse and land cover (Lin, X & etal, 2018). Idu-Mishmi society was wholly dependent on hunting therefore the human activity was mostly the hunting and foraging and agriculture. However, after 1960's human activity increased towards the infrastructure development which resulted in the landuse change in the area. Hunting is still practiced and locals continue to hunt through the same route which was used by their great-grandparents. However, hunting activity has been remodelled with the changing time. Where the road communication plays an important role.

Map: II.7



There was no road communication in the area, therefore locals used to go to the neighbouring areas to sell their products. It was the nature which guided movement of the people and hunting. The complexities in hunting developed after the development of road networks.

Map II.6. depicts the major roads and settlement in the area. The connectivity of an area has brought a major change in the hunting ecosystem. It has been found that the villages which falls along the major roads there the hunting activity is less as compared to the other remote villages. The majority of animals are killed after climbing the higher elevation. Hunters have to move more than 10 kilometres to hunt the targeted species. However, due to the development of road connectivity a slight reduction in number of animals closer to community. The movement of the people become easier because of the development of the roadways.

Hunters started moving in the vehicles till the edge of the jungle. Many people were encountered moving into jungle carrying guns doing night safari in their vehicles. The number of animals that hunters preferred to hunt going in the dense forest has not depleted. However, birds and animals in the nearby areas are getting killed. Due to the development of highways many people who moves from Anini to Roing kills the animal that encounter during night. The road passes through the dense vegetation areas because of which often, animals are sighted. Extraction of the herb plant *Paris polyphyly*, supply of wild meat to the non-locals started after the development of road ways.

On the other hand, socio-economic settings have been shaped due to the development of road. People started moving out of district for various purposes related to education, health, employment etc. Directly and indirectly the economic activity got changed and the dependency level on the foraging economy minimized as compared to the past.

The socio-economic activities and animal life are controlled by natural setting of the area. The distribution of animals, their niche, and migration is influenced by the climate, altitude,

slope, river systems and vegetation. In the similar way, the human activity and hunting is done according to the physiographic and climatic factors. Long hunting trips are done in summer and due to the snow fall in winter only shorter trips become possible. Animals too change its habitat according to the season. In the similar way the habitat selection of animals is also dependent on the season, vegetation, slope and the water availability. Hunting activity inside the natural territory of the non-domesticated species has influenced the distribution, population and the niche area of the animals and plants.

Chapter III

SIGNIFICANCE OF HUNTING AMONG THE IDU-MISHMI SOCIETY

In a civilized and cultivated country wild animals only continue to exist at all when preserved by sportsmen. The excellent people who protest against all hunting, and consider sportsmen as enemies of wild life, are ignorant of the fact that in reality the genuine sportsman is by all odds the most important factor in keeping the larger and more valuable wild creatures from total extermination.

- Theodore Roosevelt

The consumption of meat in the tribal culture can be defined as the use of any non-domesticated terrestrial mammals, birds, reptiles, amphibians harvested for food. It is a general assumption that hunting is unsustainable and that over hunting leads to the diminishing of the forest. It is because wild meat is compared with the domestic meat, just as slash-and-burn agriculture perceived in comparison with permanent modern agriculture. However, research in past three decades has seen a sustainable increase of peer-reviewed papers addressing hunting sustainability (Vliet, N &etal, 2015)

The subject of hunting appears often in the literatures of wildlife managers and sporting journals. Wildlife managers and biologist have typically dealt with the functional aspects of hunting: its role as a population management tool, its relationship to other mortality sources, and its impact on animal behaviour and demographics. Subjects of hunting in the scientific literatures are emotionally detached and analytical fashion. However, to hunters, hunting is a very cultural activity with significant social contexts (McCorquodale&etal, 1997)

In the tropical Anthropocene, hunting and the trade of wildlife still plays a crucial role in the livelihoods of rural communities. More than 150 million households in Asia, Africa and Latin America rely to some extent on wild meat to meet their dietary requirements and to support their economies (Ponta, N &etal, 2019).

Hunting is later, the outcome of economic drivers. First, it is the socio-cultural practices. Hunting is playing a important role to meet the livelihood requirement for the Idu-Mishmi in Dibang Valley. The current study tries to focus on the significance of hunting in the Dibang Valley. How hunting economy is supporting the people, it tries to understand the role of traditional methods in the conservation and the drivers which are bringing change in the hunting ecosystem.

III.1. Mapping the Animal diversity in the Dibang Valley

The district and people of Dibang Valley are blessed with the nature and are rich in flora and fauna. Due to high altitudinal variation the floral and faunal diversity is very high. Some of the common flora like Alder tree (*Alnusnepalensis*), Hemlock (*Tsuga heterophylla*), Rhododendron (*Rhododendron ferrugineum*), Oak (*Quercus*), Japanese Cedar (*Cryptomeria japonica*), Pine (*Pine sp.*), Hollock (*Terminalia myriocarpa*), Orium (*Bishofiajavanica*), Chestnut (*Castanea sativa*), Walnut, Champa (*MicheliaChampaca*) etc. The plants with medicinal values like Mishmi Teeta (*CoptisTeetha*), Herb Paris (*Paris polyphylla*), Indian Ginseng (*Panax sikkimensis*), Ginseng (*Panax pseudo*) etc are popularly found in the Dibang (District Statistical Handbook, Government of Arunachal Pradesh, 2016).

As per the survey conducted in Dibang Wildlife Sanctuary it is reported that there are as many as 156 mammal species and more than 137 bird species with the varieties of snakes which is attached in an appendix. The animals ranging from rodent to squirrel, Red Panda, Musk Deer, Serrow, Leopard, Snow Leopard, Tiger, Himalayan Black Bear, Sun Bear, Barking Deer and famous Mishmi Takin find a habitat in the forest of Dibang Valley. The Birds of pheasant species is common inside the forest and has viable population of Mishmi Monal, Red Breasted Hill Partridge, Blood Pheasants, Khalij Pheasant, Blyth's Tragopan are found (District Statistical Handbook, Government of Arunachal Pradesh, 2016).

Among the animals which inhabits in Dibang Valley, there are many animals which are never hunted by Idu-Mishmi. The hunting of animals and the animals which can be hunted

is guided by the cultural institution⁴ of the society. Through the interviews with the hunters and the locals Idu, it could be revealed that there are many animals which are never hunted by the people.

Table: III.1. **Animals never Hunted**

Common Name	Scientific Name
Black Panther	<i>Panthera pardus</i>
Tiger	<i>Panthera tigris</i>
Clouded Leopard	<i>Neofelis leopard</i>
Common Leopard	<i>Panthera pardus</i>
Leopard Cat	<i>Felis bengalensis</i>
Spotted Lingsang	<i>Prionodon pardicolor</i>
Hoolock Gibbon	<i>Hylobates hoolock</i>

Source: Field Interviews, 2019

The above-mentioned animals never hunted and therefore, they are protected under the belief systems of the Idu-Mishmi. Black Panther, Tiger and Hoolock Gibbon are the animals which are has higher restrictions in hunting. People avoid these animals in jungle. Black Panther is known as the spirit, Tiger as the brother and Hoolock Gibbon as the Sun God. It is believed hunting of these animals will destroy the hunter and his entire family. The other large cats like Common Leopard, Clouded Leopard, Leopard Cat and Lingsang are believed to bring the bad luck to the hunters. Therefore, these animals are protected by the Idu-Mishmi culture.

Table: III.2. **Animals Seasonally Hunted**

Common Name	Scientific Name
Himalayan Musk Deer	<i>Moschus chrysogaster</i>
Mishmi Takin	<i>Budorcas taxicolor taitanicolor</i>
Himalayan Serrow	<i>Naemorhedus sumatraensis</i>
Himalayan Goral	<i>Naemorhedus goral</i>
Himalayan Black Bear	<i>Ursus thibetanus</i>
Wild Dog	<i>Cuon alpinus</i>
Field Mouse	<i>Mus booduga</i>
Field Rat	<i>Rattus nitidus</i>

Source: Field Interviews, 2019

The listed animal in the above table III.2 are the prominent animals which are hunted

⁴ A cultural institution is an organization within culture which is composed of the traditional law, taboos and belief systems, language and the way of living that works for the preservation or promotion of culture.

seasonally. These animals are hunted between the month of May, June, July, August and September which is the hunting period where the long hunting trips are made. Himalayan Musk Deer is hunted for its Musk. The musk pod is sold in the market in a valuable price. Therefore, the hunters stay in the high altitudes during the hunting season. Takin, Goral, Sorrows are hunted during this season. In winter the hunters rely on the small mammals and birds. Therefore, birds like Monal, Pheasant are hunted. Small mammals and birds like Mouse, Rat, Laughing Thrush are trapped.

Table: III.3.

Animals Frequently Hunted

Common Name	Scientific Name
Wild Boar	<i>Sus scrofa</i>
Barking Deer	<i>Mutiacus muntjac</i>
Indian Wolf	<i>Canis lupus pallipes</i>
Red Fox	<i>Vulpes Vulpes</i>
Jungle Cat	<i>Felischaus</i>
Jackal	<i>Canisalpinus</i>
Civets	<i>Civetta</i>
Squirrels	<i>Petaurista</i>

Source: Field Interviews, 2019

The listed animals in the table III.3 shows the prominent animals available nearby village therefore it is hunted frequently. Hunter encounters these animals when they visit the jungle for a short duration, for a day. Among the above listed animals' deer, wild boar, civets and squirrels are hunted quite often. Children too hunt the common birds which are available in the surroundings which includes- Fly catcher, Robin, Redstart, Tits, Warbler, Thrush etc.

There are animals like Himalayan Black Bear and Monkey which are killed when they raid the crop. Villagers hunt them when they start destroying the crop regularly. Wild dog is hunted when it comes in the lower elevation areas and kill the semi-wild Mithun. The Human-Carnivore conflict has been increased in the area due to which the animals like Bear and Wild dogs are getting killed in the agricultural land which is located close to the village. The animal diversity in the Dibang is influenced by the physical and cultural factors. Animal diversity, population and distributions are affected due to the human's interference in the natural territory of the animals. Similarly, hunting of animals are playing a crucial role to

meet the livelihood requirement among the locals.

III.2. Hunting in the Local Economy

In this section rather than presenting direct impact of hunting the narratives, stories, examples and photographs are used to picturise the area and the people. It is for the sake of readers who can visualise the hunting economy as an entire ecosystem of activities which encompasses the social, ecological and economic aspects of the valley.

In the valley of Dibang hunting has supported the livelihood of the Idu-Mishmi since their existence. Hunting used to be the mainstay of the food basket of the people. Animals were hunted and the valuable parts were bartered with the Tibetans in one direction and the Sadiya valley of Assam in another. The animals such as Himalayan Musk Deer (*Aala*), Himalayan Black Bear (*Aahun*), the skins of different ungulates as well as the skin of the Tiger which were killed accidentally were bartered. Apart of animal hunting, plant like *CoptisTeetha* (*Mishmi Teetha*) are hunted for different medicinal purpose. Its roots are used to cure many ailments such as gastric. They used to barter with different valuable goods and import the weapons, wools, salt and many more items.

In the due course of time the district headquarter Anini, has transformed into a nodal centre. Anini is a small town which consist of administrative buildings, shops, military camps, residential place of the administrators and the local people from all the sub-districts represent the population of Anini. The town serves as a nodal town for the villages around to sell their local produce and purchase goods, provides health facilities, veterinary etc. Similarly, education centre as higher secondary schools are located only in the district headquarter.

The development of the district through road connectivity, market, schools etc has changed the economic activities of the people since the last few decades. Earlier, people were totally depended on the primary activities. It was only the hunting and agriculture that supported the people's livelihood of Dibang Valley are equally engaged in both secondary and tertiary

sector.

Table: III.4.

Workforce structure of Dibang Valley

Variables	Total	Percentage Share
A) Total Workers	3555	
Main Workers	2525	71.03
Marginal Workers	1030	28.97
B) Main Workers	2525	
Cultivators	807	31.96
Agriculture labour	51	2.02
Household industry workers	17	0.67
Other workers	1650	65.35
C) Marginal Workers	1030	
Cultivators	483	46.89
Agriculture labour	55	5.34
Household industry workers	51	4.95
Other workers	441	42.82
Total Population	8004	
Total Workers	3555	44.42
Non-Workers	4449	55.58

Source: District Statistical Handbook (2016). Government of Arunachal Pradesh

The above table shows that in Dibang Valley there are more non-workers than the people who work. Among the total population 55.58% do not work. Out of the 44.42% of the workforce, 71.03% of people are the main workers who work for period of 6 months or more.⁵ Remaining 28.97% of people among the workforce are the marginal workers who have worked for at least 183 days in a year. Among the main workers, the percentage share of cultivators is very less 31.96% and out of it 65.35% of the workforce are categorised into the other workers. The percentage share of cultivators among the marginal workers gets increased because economic generation through cultivation is low. The kharif crops includes maize, paddy, millets are cultivated and Rabi crop includes the buck wheat. Due to the low agricultural productivity the peoples engaged as a cultivator are less.

In both the category of main and marginal workers, a skilled man and women who knows weaving of the traditional baskets and clothes are included in the category of household

⁵According to the workforce categorization by the Census of India.

industry workers. In the others workers category in both the main and marginal worker the percentage share of other workers is very high. 65.35% is in main workforce category and 42.82% in the marginal workers category. Here, contractual workers and the people who are generating the economy by collecting plants and animals are included in the category of other workers.

Through the above data it can be understood that the dependency level of the locals in the natural resources is noteworthy. The local people are bound to rely on the locally available resources which supplement their livelihood. With the due course of time hunting became supplementary factor for the livelihood for most of the people in Dibang. This does not mean people are able to sustain keeping themselves aloof from hunting/foraging way of living.

There are villages for instance in the sub-district named Anelih in the Dibang. Out of twelve villages under Anelih headquarter, only two village are electrified. Akuli is the last motorable place. After Akuli it takes three days trek to reach the last village Cheppe.

Plate III.1.

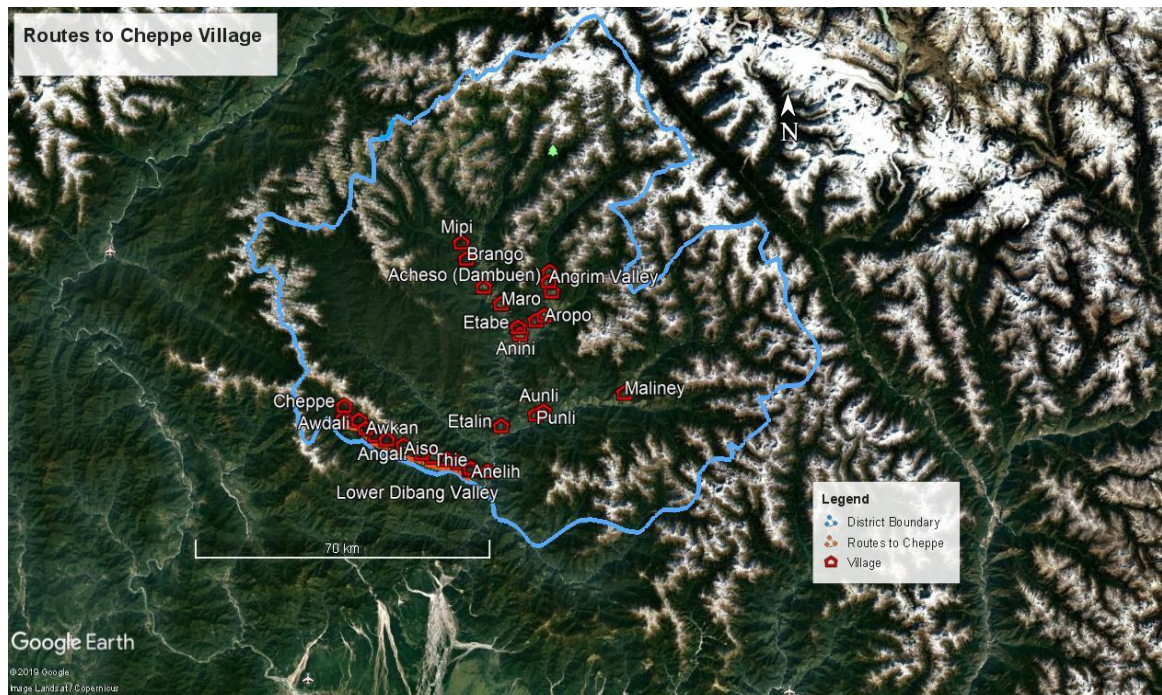
Akuli the last motorable village towards Cheppe village



Source: Field Survey, August, 2019

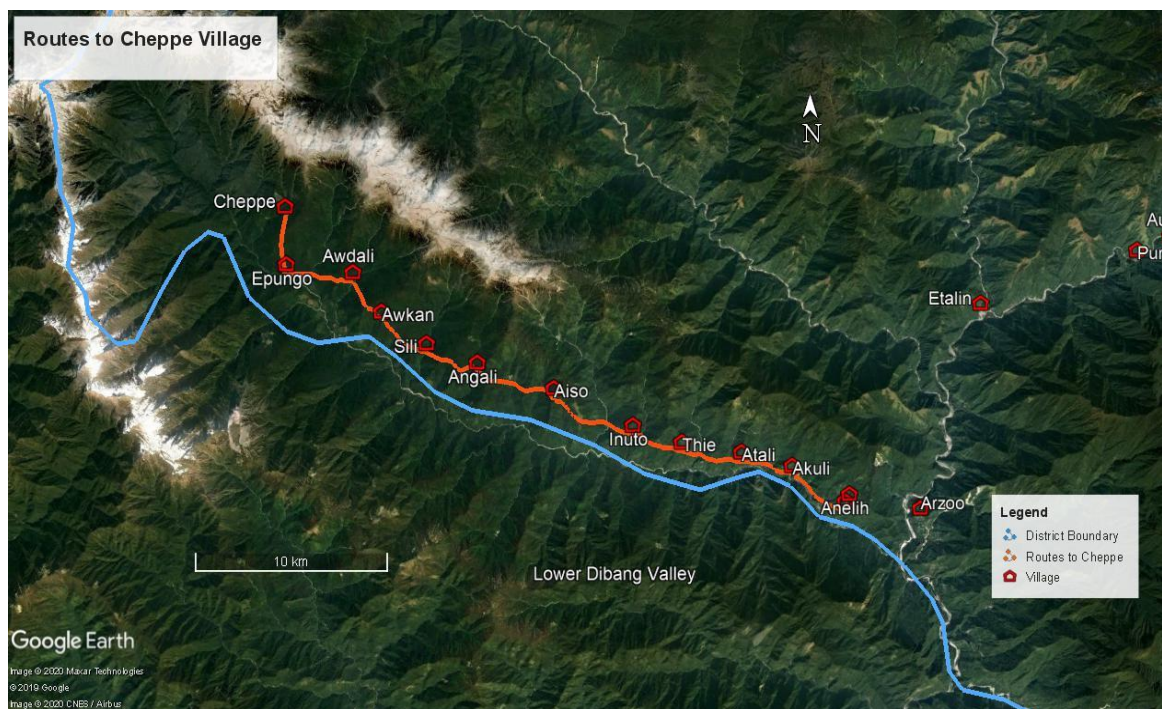
Villages in between Akuli to Cheppe are located inside the dense forest cover. There is a foot track of 20 kms which are followed by the locals. It takes three days to reach Cheppe.

Map: III.1



Source: Imageries, Google Earth Pro

Map: III.2



Source: Imageries, Google Earth Pro

Villages in these routes are scattered. Village is composed of just one, two or three houses. People walking towards Cheppe halt in any of the village according to their convenience. From these villages people use to come to Anelih to sell their locally available products which they have collected from the jungle. Earlier there were only 40-50 households in Cheppe, and agriculture was mainly practised such as maize, Buckwheat, millets were

cultivated. Locals from Cheppe mentioned that till recent they used to sell locally produced rice at Anelih.

The population towards the route to Cheppe village got decreased. The people from those areas started moving further to lower elevation areas. They settled in Anelih and Model village. However, the people in those villages continue to live in a similar life. Miss Jeena Miyuli from Cheppe villagenarrates;“I am original inhabitants of Cheppe. We came here at Anelih to acquire education and also access to the highway becomes quite easier from this place. In Anelih headquarter the aerial dropping of ration is done. Earlier when we were small, we used to carry the 30-40 kgs of ration for Rs.3/- per kg. But the people in my village still have the same lifestyle. They use to come here once in a month or in two months to get the things.”

Plate: III.3.

Old man from Cheppe village



Source: Field survey, August, 2019

There is no electricity, schools, shops or any kind of amenities. Large part of economy in these areas is supported by the foraging way of living. People have to struggle hard to get down in the lower elevation areas. Still it was noticed through the narratives of Miss Jeena and other people from those areas are much habituated with the typical way of living.

In the plate III.3. the old man is from the Cheppe village. Due to his health conditions his

daughter has brought him from the village to the Etalin. Mr. Umbrey who is 80 years old still loves to carry gun everytime and he start walking towards Cheppe when he doesn't see any people in the house. His daughter says, these people can't stay with us. They like to go in the jungle early in the morning regularly.

There are many people towards the Cheppe who are not fit to get the rations coming to Anelih. There children who use to stay in Anelih or in other areas use to take them the rations to their parents. Mr. EngaUmbrey, the school teacher of Anelih goes to Cheppe every month or in two months of interval carrying rations to his parents. He says I have my house in Anelih but they won't come and stay here in any condition.

Plate. III.3.

Old Idu Mishmi Couple from Aliney Village



Source: Field Survey, August, 2019

People in such villages are largely dependent on the foraging way of living. They hunt animals and sell the valuable parts of it. They collect the plants and sell it in the market. In such areas hunting becomes very much essential for the sustenance. A Part of the villages towards Cheppe the people in other villages are also dependent with the locally available resources.

An old couple who had no children as well as financially independent were asked about their source of income. Mr. Molo replied, "I used to hunt the animals by staying in the jungle. I used to go till Alipo in Tibet. But I am old and weak now. At the moment I rear

pig, chickens, I know weaving the bamboo baskets and caps I sell them. For the everyday meal we collect the vegetables which are available locally. Fish too supplement our meal. *Paisa hi Paisa*. Where he means lots of money.” Gnata Molo, Anelih village.

With the due course of time hunting became supplementary factor for the livelihood for most of the people in Dibang. Which does not mean people are able to sustain keeping themselves aloof from hunting/foraging way of living. Many such narratives and incidents were open up by the locals which convey, how wild animals are important to Idu-Mishmi. Sille Milli from Acheso village mentioned, “Wild animals have always supported us. The skin of Bear is used to make the traditional bag and the Gall Bladder we use to sell in the Tibet and India. But now only in India. We use to sell the musk pod of *Aala* Himalayan Musk Deer.” In a similar way, Eta Miu from Maronli village says, “Last year I hunted two *Aala* and did the gall bladder operation of my wife.”

Prominent *Igu*, Mr. EmukoMiu from Maronli village shares his views in terms of the importance of the animals for the survival of Idu-Mishmi. He explains, “This area is very resourceful. There are lots of animals which we hunt such as Bear, Monkey, Mountain Goats, Takin. Earlier the old people used to hunt from the bow and arrow and now guns are used. We used to hunt the *Aala* and used to sell the Musk Pod and in return we used to bring the salt and weapons from the Tibet. For this reason, *Aala* is in business since long history. Without *Aalawe* Idu could never survive in this land and without hunting we could never survive.”

There are places in Dibang which are incomparable with the other parts of India. Anini is the small market town with the administrative set up. There too the place lacks in the basic amenities. There are no proper medical facilities, no colleges in the town. The town is connected with BSNL 2G mobile service. Something unwanted happens than it takes huge time to get repaired. During the field work in the month of July there was a heavy rainfall and siltation in the dam took place, results in the power-cut for 15 days. Local man Mr.

Jongo Tacho enquired the junior engineer to understand the matter. He asked, why the tower is not running by using diesel? Engineer replied, no fuel has been supplied since last six months. The people of Anini too goes to jungle for the collection of plants for the requirement of their meal. Only the difference is, they can get the grocery from the nearby market.

However, that too is dependent upon various condition. The road which connects Anini to Roing town in Lower Dibang Valley gets close due to landslide. The supply of grocery is completely dependent upon the condition of the road. In 2011, the bridge got collapse in between Roing to Anini. During such time people used to carry the rations from Roing. They cover long distance on foot.

Plate III.4.

Idu-Mishmi Women Preparing the Dinner



Source: Field Survey, December, 2016

Hunting becomes more important because the everyday living of women is very different than the man. Women participation in income other than household chores, working in agricultural field, collect fodder for animals, fuel wood, and interestingly go far off jungle to trap rat and to collect the fodder. In addition, they do the embroidery work through which they can generate the income. Women work very hard to run their family.

Practice of do's and don't (taboos) for women through out the country is much in one other way. Likewise in Idu-Mishmi community, females have to follow much of the food taboos than the man. They are not allowed to eat the large wild meat (mammals/birds). This taboo equally restricts them to eat the domesticated animals like chicken, pig, duck and the semi-wild Mithun *Bos frontalis*. When asked about the non-vegetarian food allowed for women, one of the lady, Temi Mihu, 65 years replied that they are only allowed to eat rat and fish without any taboo.

Women's are not exactly forbidden to consume the meat but once they eat it, they are not allowed to wash their clothes until the new moon appears. They can only eat the fish, rats and a very few selected birds with no taboos. The female group usually don't eat any meat except fish and rat for the whole life time once the menstrual cycle starts.

While studying the Ethiopian community of Africa Carol J. Adams discussed the sexual politics of meat which is very similar to the Idu Mishmi community. Most food taboos address the meat consumption and women are restricted more than the men. As meat is valuable commodity hence, symbolise power. Similarly, Idu were the hunters, then the control of these economic resources was in their hands, thus they hold the power. The meat becomes an important element within a more closely organised economic systems therefore there exist the ruler for its distribution (Adams, 1990).

At present time no more barter exist however the foraging way of living plays the key role for the survival of the locals. The demand of the wild meat has diminished with the time. During the field study in the village Arzoo, a week was passed by eating bamboo shoot and Mushroom. The owner of the house Mr. Emi Mekholasaid, you can stay in my house and complete your field work but you have to adjust with our food. Rice and bamboo shoots are only available here.

Visiting jungle and collecting the wild resources is in the everyday living of the Idu-Mishmi. Idus are known for hunting. The Idu will not remain Idu if they discontinue the way of

living. Their identity lies with the hunting and foraging way of living. Yet the community cannot be imagined as the complete foragers who are entirely aloof from the external world. Without question the people were absolutely connected with the neighbouring land.

In Anini many people are dependent upon the shops and groceries but in the villages the case is not similar. There are families, not even a single meal is supplemented by the goods brought from the market. They eat locally available leafs, *Junglepata*⁶, bamboo shoots, mushroom etc.

The villagers use to bring the things in the market which are prized. They use to practice the agriculture nevertheless it is the foraging way of living which supports them economically. The requirement of the resources in the everyday living of the people are very less and much of them are available locally which helps them to sustain. The traditional economic system has always governed the area and the people.

III.3. The Prominent Animals

When the people are asked – which are the animals do you hunt? The reply will be straightforward, we hunt everything. However, that's not the reality. The reality become known when the question is reconstructed. 'Which are the animals you don't hunt'? We never hunt the Black Panther, Tiger, Leopard or any other large wild cats. It goes on such like, we don't hunt Hoolock Gibbon, Linsang, water snakes.

The male hunt the large mammals and it's the pride for them. It includes the number of animals hunted in the list of hunters. The meat *tambre* too is liked by everyone. Rats are the prominent species for the females which are trapped in winter. Small birds that is found in the surroundings are hunted from the catapult by the small boys. The common birds they hunt are Laughing Thrush *Puku*, Parrot bill *Prasana*, Fly catchers *Piti*, Yellow billed blue Magpie *Akawe*. Many times, the animals become prominent to hunt because of human-animal conflicts. The human-carnivore conflict is recorded in higher rate because of which

⁶Junglee Pata includes, Pig weed, Chinese Leek and other green leaves which are available locally are generally used by the Idu-Mishmi.

the bear and wild dog are killed. Apart of it there are several animals which hunters usually hunt in their hunting trip. The prominent one is listed below: -

Table: III.5. **Prominent animals generally hunted**

Category	Local Name	Common Name	Scientific Name
Ungulate	<i>Aala</i>	Himalayan Musk Deer	<i>Moschus leucogaster</i>
Ungulate	<i>Aakru</i>	Mishmi Takin	<i>BudorcastaxicolorTaxicolor</i>
Ungulate	<i>Maanjo</i>	Indian or Red Muntjac	<i>Muntiacusmuntjak</i>
Ungulate	<i>Maren</i>	Himalayan Serrow	<i>Capricornis thar</i>
Ungulate	<i>Aammee</i>	Wild Pig	<i>Sus Scrofa</i>
Ungulate	<i>Aamee</i>	Red Goral	<i>Naemorhedusbaileyi</i>
Primate	<i>Aame</i>	Arunachal Macaque	<i>Macacamuzala</i>
Carnivore	<i>Aahun</i>	Black Bear	<i>Ursusthibetanus</i>
Carnivore	<i>Aprupu</i>	Wild Dog	<i>Cuonalpinus</i>
Carnivore	<i>Aapoee</i>	Himalayan Palm Civet	<i>Pagumalarvata</i>
Carnivore	<i>Aiminjini</i>	Red Panda	<i>Ailurus fulgens</i>
Rodent	<i>Ranjpankhi</i>	Flying Squirrel	<i>Pteromyini</i>
Rodent	<i>Kachingo</i>	Field Mouse/Rat	<i>Apodemussylvaticus</i>
Bird	<i>Peba</i>	Satyr Tragopan	<i>Tragopansatyra</i>
Bird	<i>Pidi</i>	SclaterMonal	<i>Lophophorusssclateri</i>
Bird	<i>Chenda</i>	Himalayan Monal	<i>Lophophorusimpejanus</i>
Bird	<i>Chicko</i>	Blood Pheasant	<i>Ithaginiscreuentus</i>
Bird	<i>Prasana</i>	Parrotbill	<i>Paradoxornis</i>
Bird	<i>Puku</i>	Laughing Thrush	<i>Trochalopteron</i>

Source: Field Interviews, 2019

The above table shows that there are ungulates which are mainly hunted by the Idu-Mishmi. Among them, Himalayan Musk Deer, Takin, Wild Pig, Sorrow are the animals which are hunted seasonally. Among the carnivore, Civets, Black Bear and Wild Dog are prominent animals which are hunted. Hunting is important component of wildlife management because it is an efficient means of controlling wildlife populations (Byrd &etal, 2017). In the Idu-Mishmi ecosystem, hunting is not only culturally important but it has able to balance the wildlife populations through the taboos and believe systems.

Over seventy five percent of large predators declining. Globally, population of large carnivores are getting lost. Their ranges are collapsing. Many of these animals are at risk of extinction. It is because of the wild animalsconflicts with Human and Livestock. In the world, top predators are still shot, trapped, positioned or even speared (Jeremy, 2014).

However, in the Idu-Mishmi culture the large Wild Cats including Black Panther, Tiger, Leopard, Snow Leopard which plays an important role in the conservation are protected by the culture. In the Dibang Valley due to the high altitudinal zone and the harsh climate the population density of these animals was less. On the other hand, the prey diversity is much higher as compared to the predators. Therefore, hunters play a crucial role by balancing the animal diversity through traditional and systematic way of hunting.

III.4. The Frequency of Hunting and the Group Size

Observation constructed a challenge to classify who are the hunters in this valley, what kind of hunting activity runs in Dibang Valley and how the frequency of hunting has been designed. The old man and women were found climbing the mountains, small kids were busy chasing bird with the catapult. School and college going students were deep enthusiast with the plans for the next trip to jungle, females who took the responsibility to take care of the house had to go to the jungle to collect the fodder. The regular hunters use to get ready every time with their long knife and gun. Soldiers who are timely deployed for the long-range patrolling and short-range patrolling (LRP and SRP). After all, conversation with hunters and military officers could help to resolve such query on the types of hunting.

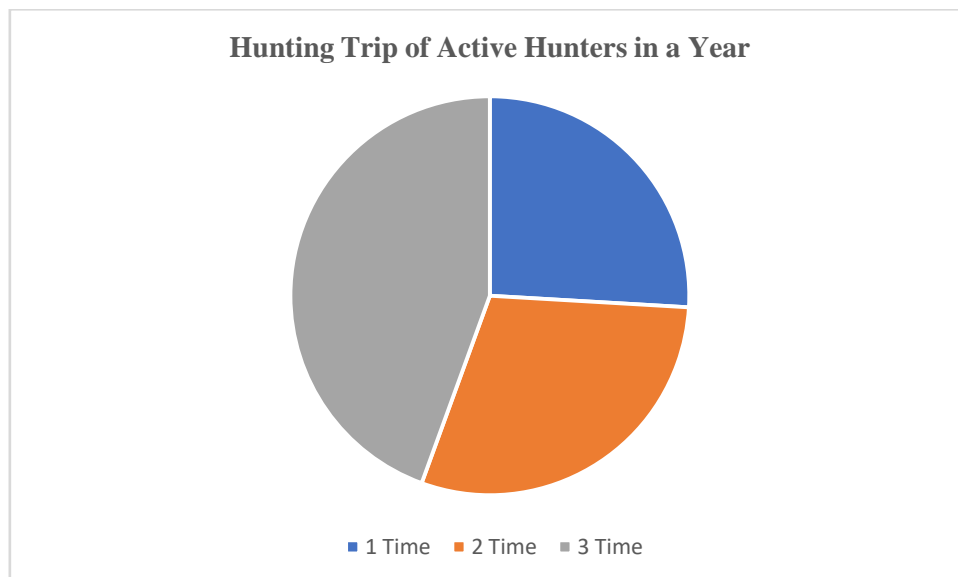
In Dibang there exist three types of hunting-

1. People usually use to go to the jungle and collect the fodder for animals and edible plants like mushroom, many wild leaf and bamboo shoots. It is a very short visit to the forest and in that visit, if they see any birds or any other animals, they will kill it.
2. People go to the nearby areas to hunt and collect the fodder. Such trips are generally made for three to four days to week. In such trip they properly dry the meat and bring in the basket because the major purpose is only the meat.
3. When people go to the high-altitude areas till the border. In the high altitudes people hunt for the survival purpose. They hardly bring any meat to the village as their main purpose is to bring the Musk Pod.

III.4. (i) Characteristics of the Respondents

In-depth interviews were selected as a method to understand the frequency of hunting. Both the hunters and non-hunters were interviewed from the 11 villages. 60 households were chosen as the sample which includes 45 number of male and 15 were female. Among the 45 males 10 were the 'active hunters' which includes the person who routinely goes to the longer trip for hunting. 58 households reported that they consume the wildmeat at least once in a year which don't include the small birds and rats. Two households report that they never consume the wild meat because no male was there in the family.

Figure: III.1.



Source: Field Interviews, 2019

The frequency in consumption varies greatly. In the house of the hunters they consume the seasonal wild meat when they visit jungle. In case of non-hunters, they have to rely on the meat which are distributed by the hunters. The non-hunters in the age-group of 45 years reported that the majority of their friends' hunt. Whereas the age-group below 30 years reports that their very few closest friend hunts. It was observed that the age group below 30 years are losing interest to live the life of hunters. They go in a group for hunting which consist of 3-5 people. The 8 interviewee who were the non-hunters had hunted earlier but never hunted since past 10 years.

Thirty females were asked whether they have visited the border till Tibet. Among thirty,

only four had visited. Those four people went as a porter with the military officers. Usually females don't participate in hunting with the males.

III.4. (ii) The Group Size

The size of the groups depends upon the situation and plans. If the duration is short period than they go alone in the jungle. If it is for longer time than they prefer to go in a group. Although that is not general. There are many hunters who roam alone in the jungle for over a month. They stay in different caves in the high-altitude areas and wait for *Aala*. In the high-altitude areas, they hunt other animals for the survival. They barely bring any meat in the village. If they hunt the large meat in the area which is accessible in a day than they return back to the village, assemble the young boys and go back to the jungle to bring back the meat.

Generally, two people consist a group and maximum of four to five people. It was found that the idea about the group size differs among the old group of people who are retired hunters and the present-day hunters. The retired hunters generally used to go alone in the jungle. However, some preferred to go in a group and the group consisted of 2-3 members. During that time the animals which are hunted belong to the hunters. The narratives from the old group of people like Mr. Umpey from Maliney village reveal that, “there never existed the system of distribution among the group of old hunters.”

Whereas, the present-day hunter, Mr. Eta Miu from Maronli village narrates, “last year we five people went to hunt *kasturi*⁷. I had a big loss during that trip. I alone hunted three *kasturi* and rest didn't get any. The Musk Pod we shared among the five. At present, hunter have to share the resources among the group because it is believed everyone went together therefore the sharing should be done equally. These are also the reason because of which the active hunter today prefers to go alone in the jungle.

The young people compared to the earlier generation loosened the hunting skills as compared

⁷Himalayan Musk Deer is locally called *Kasturi* and *Aala*. *Kasturi* is a general term used across India and *Aala* is *Idu-Mishmi* term.

to the hunters who used to be expert in the jungle. However, the young generation has not lost the interest in going to the jungle. There are very fewer active hunters remain under the age group of 25 years. Because of which they prefer to enter jungle in a group.

'Earlier the resources belong to those who are fit to take it' whereas in present-day the idea of 'distribution' came in the society. Earlier the people were highly expert in jungle. They never bothered much about the group size. Whereas the active hunters in younger generation are very less due to which they don't possess skill in jungle as compared to the skill hunters. Due to which they prefer to go in the group. Their group size consists of 3-5 people. This is how the shift from individual owing to distribution of the resources emerged.

III.4. (iii) Hunting Season

Hunting continues all over the year. However, the targeted animals and duration of the hunting trip is depending upon season. The hunting season can be classified into three different group.

Table: III.6.

Animals hunted in particular month

Months	Targeted Animals
December, January, February, March	Rat (<i>Kachingo</i>), wild birds (<i>Prah</i>) and other mammals which are available in lower elevations are hunted. Generally, in this season the booby traps are used.
April, May, June, July	Hunting of Bear (<i>Aahun</i>), Takin (<i>Aakru</i>) Deer (<i>Manjo</i>), Serrow (<i>Mai</i>), Wild Pig (<i>Aamme</i>), Mountain Goats (<i>Ajuchi</i>), <i>Aala</i> etc are hunted.
August, September, October, November	The targeted animal is <i>Aala</i> (Himalayan Musk Deer), Takin, Bear etc

Source: Field Interviews, 2019

During winter in the month of December, January, February and March hunters cannot climb the higher elevation zone the mountains are covered with snow. They rely on the animals which are present in the nearby areas. During winter, animal come closer but due to sloppy terrain and the thick vegetation cover the sighting of the animals become rare. Therefore, during these months rat, wild birds and mammals which encounter to the hunters are hunted.

Whereas April, May, June, July and August are the month of long hunting trips. Animals like Takin, Bear, and various ungulates are hunted. June, July, August and September are

the month in which hunting of *Aala* is done. As the temperature decreases, animals start moving down to the lower elevation areas.

The duration of hunting is governed by the number of factors. Among all, the seasonal factors play a prominent role. In summer the active hunters used to go to the jungle for longer duration. In winter the hunting duration is maximum for 4-5 days. Winter trips are for short duration therefore, experienced and jungle experts go early in the morning and manage to cover a long distance and return in the evening or in the next day.

In the month of January 2017 Napi Mango, the local Idu was ready to be a host in search of Takin. He made a decision to go towards the Dri valley. After reaching 2101 metre the tiny particles of snow flurries started. In winter it becomes difficult to climb above that height. Due to which hunting of animals takes place in summer. During summer, animals like *Akru* Mishmi Takin and other large mammals gathered in the same place in the high altitudinal areas but in winter they get dispersed.

First factor is season, which is prominent among all. Now, this is the second duration factor i.e. rations. Duration of stay largely depends on what quantities of ration they carry. Generally, they take ration by estimating 15/20 days or for a month. It also depends upon for what purpose the jungle trip is made. Generally, the shortest duration in summer is for 15 days and the longer duration is for a month or 40 days. As Mr. JongoTacho narrates, "I roam entire month alone in the jungle. It is good to roam alone. If you carry 15-16 kgs of weight than you can roam for a month without any problem."

The physical factors play the key role in the movement of the hunters. In summer they go to the high altitudinal areas for hunting. Military personnel as well go to do recky till the border. Their movement is restricted by the natural forces. Such physical barriers create a natural design in hunting. There are targeted animals which are hunted/trapped according to the season.

The hunting is largely guided by the socio-economic status and cultural kit. The people who

are economically uplifted (government officers, contractors or business persons) are less dependent on hunting. They do hunt but that is mostly for the recreational purpose. They go to the jungle according to their convenience.

It was found that the people irrespective of social/economic class respect the culture. It is believed that the person who fails to follow the taboo than the (*Golo*) the jungle spirit will get angry. If that happens than the (*Misu*) the evil spirit will destroy the person and his entire family. Prominent *Igupriest* EmukoMiu from the Idu-Mishmi community narrates, “If the taboo is not performed in an appropriate manner than the person will suffer from the mental illness, something wrong will happen to the family, person will do suicide or die due to some accident and definitely the house will be burned.”

There are two old ladies who are suffering from mental illness. People say that those old ladies used to eat the wild meat without performing the *gyena* (taboos), which results in suffering. Dr. Dilip Chetry who was working in Hoolock Gibbon in the Lower Dibang Valley faced the difficulties in doing research because no one was ready to be his host. Idu-Mishmi believes 'Hoolock Gibbon' is the 'Sun God'. They believe seeing the Gibbon brings them the bad luck.

Believe systems and taboos influence hunting and its frequency. There are hunters who cannot go for the hunting trip due to the taboos. Mr. Jongo Tacho planned for the jungle for a month but he could not go because one of his brothers died in the village. Snowfall will start after a month. The season for *Aala* will pass away. He says, since last two years he is planning for the jungle and every time something unwanted happens. Moreover, People are not allowed to go to the jungle for 10 months when the person wife dies.

Mr. Doro Etdoro from Etalin village narrates, “in the Idu culture people are not allowed to go to jungle for ten days when the baby is born. Besides they are not allowed to consume any kind of wild meat during this time.”

According to Idu-Mishmi culture, people are not allowed to go to the jungle more than three

times. Cultural way of preserving resources unlike the modern developmental activities. They believe that going more than thrice makes spirits angry. Chisa Miu one among the prominent hunter he went to jungle, the trigger of his gun was not working smoothly which the hunters believed is not the good sign. Therefore, he returned. Similarly, in the jungle the test of misfortune is done with the birds. While chopping the bird one hunter asked the other, is there something wrong? The one who was cleaning the bird, replied, there is no spots in the liver. 'They say it is suggested not to move forward if any wrong sign appears in the liver'.

The social taboos are engraved among the Idu-Mishmi community. For hunters the frequency of hunting is largely determined by the situation. If someone violates the taboos than it is believed that something wrong will happening to the person. If any such things will happen than the priest will be called to follow the rite and he will narrate the misdeeds done by that person which results in such circumstances.

III.4. (iv) Hunting and the 'Extra locals'

There is a change in the entire cultural set up in the Dibang. Earlier the locals (Idu-Mishmi) were the only hunters in the area. Since 2015, the people from other parts of Arunachal are entering Dibang to collect the herb '*Paris polyphylla*' known as Letesi in Idu and generally called Katchu. The Nyishi, Solung and Tagins are among the major community who are called as a labour to collect the Katchu. The collection of katchu begins from the month of April till the last week of August. The deal with the owner is done in such a manner that the profit will be distributed in equal half.

The local people in this area are dependent on the collection of resources from the jungle. They go to the jungle for once and twice in the season and collect the herb in a year. It would be sufficient for them to feed their family. At present Nyishi/Solung carry the gun, they enter into the jungle. They are not only extracting *letesi*,⁸ they too kill the

⁸ Paris Polyphylla is a medicinal herb locally known as Letesi and also Junglee Katchu

*Aala*Himalayan Musk Deer.

People have reported the incidents that, if once the locals take them to see their area from where the plant can be collected than from next time, they go by themselves without the permission from the owner. When the locals meet them in the jungle than they lie them by pointing the owner to someone. Mr.Tocha narrates an incident, once in the jungle one Idu asked a Nyishi about his identity. They said they are the labourers of Ngata. Co-incidentally it was Ngata who asked the question in the jungle who never knew those labourers.

Furthermore, the Nyishi people take the contract and sent the Solung in the jungle because Solungs are the slave of Nyishi. Solung have to give half of their income to the Nyishi. Nyishi are among the major community who comes to the Dibang for katchu. However, Solungs wants to stay in Dibang. They follow the commands of their owner. In Dibang they are free from such command. Therefore, they try to spend their money through every possible means. Even in winter they heat the cold drinks in the fire and drink. They purchase the mobile phone, where the original price is 8000-9000 but they spent Rs.15000 in Anini to get that phone. These people try to hunt as many animals and plants they can and money in earned are lavishly spend. Hence, the frequency of the people going to the jungle for hunting gets increased.

With the continuity of the traditional way of hunting and collection of plants the biodiversity is not affected much. When the outsiders get into hunting than the sustainability and cultural hunting will not remain. Idu-Mishmi are the 'hunters' apart from 'brutal' hunters. They practice taboos which restricts them in hunting many species (animals/plants) and the number of times they are allowed to visit jungle. To non-Idu animals are just the wild living creature. If this continues than hunting becomes gaming.

Thirty households in Dibang Valley were encountered who sends the labourers in the jungle. The knowledgeable people were found debating with their own people that what are the bad impacts of outsiders entering to jungle and the reasons to restrict them. Finally, in the month

of September 2019 the NGO named, “Idu-Mishmi Literary and Cultural Society” called a meeting with the locals to ban the outsiders to enter into the jungle. The society too requested the (Member of Legislative Assembly) MLA and District Commissioner to restrict these activities officially.

III.5. Perception of researchers in the Hunting Terrain

For the most part work of a researcher is overlooked. However, in an exception the work published by researcher brings a huge impact in changing the entire scenario of an area through various institutions. When a person enters into the field of research, he/she is always expected to produce a fine thesis. The researcher too tries to unearth the information. Oftentimes the person forgets that when he/she steps into the field, the expectations flow from the ground where every single person expect that the documentation will be done for the betterment and welfare of the area. However, many time researchers fail to address the issue.

This happened in case of Dibang. After reaching Dibang Valley, locals were found rude and lost their expectations from the researchers. In the first meeting with Mr. Manmohan Miu who is the General Secretary of an NGO, Idu-Mishmi Allied Society, highlighted the problem, local people are facing due to the researchers. “You people work in our area and write whatever you want and submit your thesis and publish the work. You never show your face after the completion of work but we the people in the ground have to face the problem. Due to the researchers work the government wants to make the tiger reserve in this area. Where the local people shall will go.”

A meeting was called on 23rd of June, 2019 by an NGO, IMES to discuss the issue related to the Wildlife Sanctuary and Tiger Reserve. In the meeting, some were very rude, some were hard and some soft but almost everyone were speaking against the researcher. Mr. Man Mohan Mihu while addressing the issues explains how the people were exploited by the government and administrators. He equally criticizes the researcher. There were prominent

faces among them Mr. Dipen Molo, Ngasi Mena, EmukoMiu and many other addressed the issue. To summarise, it was decided in the meeting the scholars should be restricted in this area, they say, it is because of them Dibang Valley has been exposed wrongly. “Had there been no wildlife researchers than no outsiders came to know about the Tigers. Scholars come and locals wholeheartedly support in their work but every time they create problem.” Decisions were made; no scholars shall be allowed to conduct any kind of research in the area, particularly the researchers who work on Wildlife.

The issues related to wildlife sanctuary and the role of institutions will be discuss in the next chapter but the question in this situation is how come the people who no matter when welcomes the outsiders turned so rude? What kind of mistake did we the researcher committed due to which common people are so much worried about their elemental rights?

The story starts with the rescue of Tiger in the Angrim Valley in 2012. The three tiger cubs were rescued but later created an enthusiasm among the wildlife scientist to work on Tiger. Among the Idu-Mishmi prominent face in Dibang, a conversation on conservation was made with Mr. Jibi Pulu, the social worker and conservationist. A question was put to him. What does the conservation mean to him? Briefly he narrated, “We have many evidences and photographs of tiger in Dibang but we shall never publish it. Everybody knows that the tigers are available here, publishing it means inviting the poachers. I try not to be get disclose.” A person like Jibi don't want to disclose it because the tigers in the Dibang Valley is not protected by the government, forest department, NGO not any biologist. There is no legal protection/security provided by the government. Poachers can enter through different route to hunt the tigers.

Despite that, in the year 2018, the first publication on Tiger was released under the title "First photographic record of Tiger presence at higher elevations of the Mishmi hills in the Eastern Himalayan Biodiversity hotspot, Arunachal Pradesh". It was highlighted in the newspaper, flashed in TV news. Consequently, the government and institutions like

National Tiger Conservation Authority (NTCA) and Wildlife Institute of India (WII) became very intent to declare the area into 'Tiger Reserve'.

This triggered the question what does conservation means/who are conservationist? According to International Union for Conservation of Nature and Natural Resources (IUCN)- “Conservation is the management, care, protection of ecosystem, habitats, population and species in or outside natural habitats for their long-term performance”. But how does the researcher make 'conservation'?

In the process of data collection, the researcher conducts the survey and publish their work. The snapshots are uploaded in the social media and the person is to be known as the great conservationist who is helping wildlife to be flourish.

In animal day, the painting/quiz competitions are organized as an awareness campaign. Efforts are made to make conscious to the local people. They display, the richness of the area in terms of wilderness. Which are the animals/birds/reptiles present in the area. The importance of wildlife conservation was thought.

Repeatedly it is failed to understand the local people whose everyday living is destined by the nature, have always respect and are highly valued. Tribal like Idu have a taboo and believe systems which forbids the entire community to abuse the nature. However, the traditional mode of conservation is often overlooked.

Wendell Berry who is a conservationist, farmer, essayist, novelist, poet and the professor of English writes, “No settled family or community has ever called its home place an “environment.” None has ever called its feeling for its home place “biocentric” or “anthropocentric.” None has ever thought of its connection to its home place as “ecological,” deep or shallow. The concepts and insights of the ecologists are of great usefulness in our predicament, and we can hardly escape the need to speak of “ecology” and “ecosystems.” But the terms themselves are culturally sterile. They come from the juiceless, abstract intellectuality of the universities which was invented to disconnect, displace, and

disembody the mind. The real names of the environment are the names of rivers and river valleys; creeks, ridges, and mountains; towns and cities; lakes, woodlands, lanes roads, creatures, and people.⁹

In conversation with Senior Biologist from the renowned NGO, World Wide Fund for Nature (WWF) highlighted her views on conservation, “To conserve the pristine biodiversity people should not be allowed to enter into the forest, that's the only mantra.” If the researcher can go in the field with such predetermined mindset than the people for them will always act as the barrier. If the nature will be imagined the pristine than no conservation can be made possible.

Mr. JandoTayu from Kongo Village find fault with the researchers and he observed that researcher as a person show only the one side of a coin. He states, “researcher come and do research, but write the positive side also. I am not saying not to write the negative side and write the goodness of Idu-Mishmi. You are a researcher you have to be like it. To speak about the wildlife sanctuary why researcher end up by writing how many endangered species are found in the area. Why they don't bother to write how Mishmi conserve the wildlife.

This could be related with the class lecture delivered by Dr.Uttam Lal who gave a notion of human-nature (co-construction). He quoted, “often, to protect the wildlife we separate it from humans. However, the fact must be accepted that there is no pristine environment/wilderness, the wilderness that we see is a cultural or human-made wilderness.”

In similar fashion Dibang valley is known for its wilderness but there lie a very few discussions on cultural wilderness. Idu inhabits the land since the existence of humans in the area. Since then the hunting is continued still and all there is a rich biological diversity. If the 'hunting' is imagined as a brutal activity, like the 'game' for the colonials, a commercial

⁹ Retrived from (<https://www.zzgoozdreads.com/quotes/151646-no-settled-family-or-community-has-ever-called-its-home>) Accessed date: 15/10/2019

pursuit, threats for the continuity of ecosystem.

The people are dependent on the foraging activity. They hunt the animals but the taboo and believe systems helps those animals to get conserved. There occurred a change in the Idu-Mishmi way of living. The people are engaged have started losing interest in hunting. The number of active hunters in the valley has been reduced. People have become aware about the importance of wildlife. They started working towards the wildlife conservation and protection of species. Intellectually they criticise and show the loopholes of the wildlife researchers in protecting the wildlife. Furthermore, they debate how the Idu-Mishmi culture has set the best example of 'co-existence' with the nature. If we ignore the broad relationship between Human and Nature than we will fail to understand the dynamics of conservation.

Chapter IV

HUNTING AND SOCIAL INSTITUTIONS

Grounding the work with an idea of Human-Nature co-construction, it is very necessary to have an appropriate understanding of the society. It is important to understand the origin, belief systems, language, food, dress, birth and death rituals, marriage and festivals with reference to animals in the valley.

IV.1 A brief introduction to the Idu-Mishmi culture

British Sociologist Taylor, defines culture as “complex whole including belief, art, religion, values, norms, ideas, law, knowledge, custom and other capabilities acquired by a man as a member of a society” (Tylor, 1871). The everyday living of the Idu-Mishmi is rooted heavily into the societal cultural values. It is the cultural institutions which determines the Human-Animal relationships in the Dibang Valley. The everyday living of the Idu, their rituals, marriage system, festivals, ^{ceremonies} and the taboos influence their relationships of the Idu with animals and hunting. This section tries to connect the Idu-Mishmi way of living with the animals and hunting.

IV.1 (i) Origin and division of language

The original habitats of Idu-Mishmi were supposed to have been the highlands of north-east Tibet. They migrated towards the Dibang which is their present locality and others further spread out (Chakravorty, 1964). Idu-Mishmi represents early wave of migration and known to be the first migrants apparently about 500 years ago. The Miju and Digaru have retained their own language but some share common uniform culture, which differs considerably from the Idu (Mills, 1952).

The one liner of Mr. JibiPhulu explains the origin of Idu-Mishmi. “I am Indian till I am alive, as I die, I will become Chinese”. Illustrating the patriotic affection to his native country India, he further explains: after I die our *Igu* will sent back the soul to the place of our origin i.e, China (Lal, 2019). Mishmi inhabits in the other side of the border as well.

There is a similarity in language and culture of the Mishmi from Dibang and the Tibet. *Igu* priest from the Dibang used to go and perform the rituals in Tibet. Border has created a kind of cultural barrier and thereby brought difference among the people despite being from the same cultural roots. However, interactions between the people from both sides continues along the border.

Idu-Mishmi have a distinct dialect which falls into the Tibeto-Burman group of languages. They have a rich oral language, but have not yet successfully developed script. The oral tradition of Idu-Mishmi is divided into two parts. The priestly language is called *Anga-Apuya* while colloquial version is known as *Ang-Nga-Aliya* (Sarma, 2015). The speakers of Idu-Mishmi language are reducing with the passage of time which will bring a greater change in the continuation of the culture. It will impact the continuation of traditional believe system and the hunting culture. The belief system has regulated the hunting and loosing of language will bring negative impact on the Idu-culture.

IV.1. (ii) Village and house type

Villages are very scattered in the Dibang. Villages are normally small and consist of even less than ten households. Anini have grown into small town from being secluded villages mainly on account of being local administrative nodal point. The villagers adjoining area came into live in the place where the connectivity became much easier.

Table IV.1: Circle wise No. of villages/households

SL.NO	Name of the circle	No. of Villages	No. of households	Village consist a dozen or less households	Village consist more than dozen of households
1	Anini	31	1116	24	7
2	Mipi	15	107	12	3
3	Kronli (Arzoo)	23	309	16	7
4	Etalin	34	293	28	6
5	Anelih	17	127	15	2
6	Dambuen	14	248	8	6
	Total	134	2200	103	31

Source: District Statistical Handbook (2016). Government of Arunachal Pradesh

The table IV.1 shows that there are 134 number of villages in the Dibang Valley. Among

them the district headquarter Anini consist the 1116 number of households which is the highest share among all the circle. The data clearly reflects that the villages in Dibang are very scattered and out of 134 village only 31 village has more than 12 number of households.

Idu has a large passage bamboo house which has number of large rooms. Entering the house, the first room is reserved for the guest. The room is carpeted with the traditional bamboo and has a fire place in the centre. The animal skulls are decorated in the same room. The rooms of the family members start after the guest room. The number of rooms is dependent on the size of the family. All the rooms have a fireplace. The number of fireplaces in rooms dependent on the requirement of the family. Plate IV.2. (e) Fire place. There are many fireplaces in a house. In first room of a house, the fireplace is for guests. Guest he can cook what-ever they likes. In addition, meat of wild animals are consumed in the first room. Such meat are rarely be taken beyond this room.

Plate IV.1:

A Typical Idu-Mishmi House



Source: Field survey, August, 2019

The photographs of plate IV.2. (c, d, e, f) were taken at Mr. Janata Umpey's house in Maliney. He explained the usage of these fireplaces. The second room has three fireplaces. The one is for the male and other for female because females do not eat the meat. The Third

one to cook fodder for pig. In the fourth room one fireplace is for my mother.” Presently there are very few fireplaces in the people's houses. Earlier one house usually consisted of 9-10 fireplaces. Due to the *gyeana*¹⁰ taboo and multiple works it requires many fireplaces for Idu. The fireplace in every room is also required because of the extreme cold condition which prevails in the area. The culture of nucleated family exists among the Idu-Mishmi.

In the Idu-Mishmi culture the wall of the first room is adorned with skulls of different wild animals including semi-wild Mithun. However, this display of skulls in houses is on decline. Such skulls decorated houses are now only found mostly in villages. Earlier number of skulls adorned used to signify persons status such things are not practiced today. Young people go to jungle for hunting targeting Musk Deer and to collect the medicinal herbs through which they earn money. Presently, no one bothers how many animals are hunted by whom.

IV.1. (iii) Religion

Idu Mishmi believe in male and female spirits as God and Goddesses. They believe 'Maselogini' is the creator of the universe. 'Nani Intaya' is believed as the Sun God. Golo is the God of nature and the wild animals. Idu priests are referred to as *Igu*. Idu believes whatever events happen because of spirits. They are quite fearful of the spirits; hence, remain cautious in following rituals and observing taboos. It is believed that wrong incidents like suicide, accident are result of the anger of spirits

Hunting is guided by the religious institution of the society. Animals that can be hunted and cannot be hunted is already designed. There are animals like Tiger, Leopard, Hillock Gibbon, Linsang which cannot be hunted and are feared animals. Hunting of these animals are believed to bring bad luck and miseries to hunters. Animals which are not hunted have been placed higher in cultural context of the society. It is the religious institution who has designed the number of time hunters can visit the jungle for hunting and fishing. The one

¹⁰Gyeana means taboos in Idu-Mishmi language.

who go against the rule will suffer anyhow. Thus, Hunting is controlled by the religious institution.

IV.1. (iv) Birth and death

When the women is pregnant before 3-4 months of childbirth the mother starts preparing the *yu* traditional rice beer. The father rears two chickens which shall be consumed after the birth of the child completing the rituals. Parents have to follow the *gyeana* for ten days and the guest too has to follow the *gyeana* for a day. According to the rituals, parents are not allowed to cut the firewood's and also there is restrictions in consuming food/food taboo. No family members can go and attend any ceremony and rituals. Especially the death rituals. *Ataye* rituals is done when the new baby is born for the wellbeing of child.

Plate IV.2:

The Funeral



Source: Field survey

Idu-Mishmi use to put the corpse under the mud nearby their house. The priest is called for doing the rituals. The ritual is done for 4-5 days. If the person dies with the unnatural death than the ritual is done for four days called *Arebu*. *Aiye* is the ritual done for the normal death. During the funeral ritual *Atonsa* and *Yakula* is also done for the protection of entire family from the evil spirit. *Igu* narrates lots of story to the soul and show them their path, where should they go and stay now. *Igu* send them from the house, cross them the river,

mountains. In *Igu* terminology it is called *Aseleko*.

Ewullu are the crying person plays a prominent role in the dead rituals. Without them the soul cannot rest in peace. It is their duty to protect the corpse from decaying for 4-5 days. Idu believe that when a person dies, they carry a lot of pain and miseries. The *Ewullu* helps them to overcome with the sorrows. While sending the soul to the destiny. *Ewullu* take care about the food, drinks and the essential things.

The people from all the area come to attend the funeral. They offer the Mithun and pig to the family. The entire village has to follow the taboo. Villagers can't go to the jungle for a month. They can't go to the agriculture field until the funeral get over. Only the domesticated animals like, Mithun, Pig and chickens are allowed to cook in the funerals. The non-domesticated animals have a taboo to use in the funeral. The villagers too are not allowed to go in the jungle. In the Idu-Mishmi rituals when any one enters into the compound of the house where the dead rituals are going on than he is not allowed to come out of the compound until the rituals get over. The whole village is considered as a taboo. No one can move into the other village crossing the village until the completion of the ritual. In such a way the rituals are controlling the hunting in the Idu-Mishmi society.

IV.1. (v) Marriage

When the Youngman finds a suitable bride, he communicates with his parents. If the parents have no issue with the son's choice than they send the mediators to the girl's family. If both the boy and girl's parents agree than the conversation proceed towards the demand of girl's parents demand the mithun and pig. The boy has to fulfil the demand. After settling all the matter than the date of marriage is fix. The marriage is very short and simple. All the villagers and relatives gather in the girl's family and eat the mithun and pork which is offered by the groom.

The groom's family and their guest who attend the marriage cannot eat the *tambre* meat. This ritual but throughout the life time the groom's family cannot eat the *tambre*. Because of

which fish and vegetables are prepared for the bridegroom. In the marriage there is no absolute rule that the bride is required to attend the marriage. The most important thing is the family gathering and the mithun and pig is required to be slaughtered. Earlier the marriage 'also' used to be done by pulling the hand. When a boy like a girl and if he wants to marry her than he will keep her into his place by pulling the hand of a girl. The closest people from the bride's family helps in doing so. The mediator is sent in the girl's house and approach the parents. According to the rule the men can keep the girl in his place only for five days. Within five days time, everything's must be settled.

Idu don't marry with ten close clans. If anything, wrong happens than men has to pay a huge amount of fine to the girl's family. Earlier young girls were very scared of coming out of the house alone. There was always a chance of pulling hand. Such marriage is not practised at present. In Idumarriage system Mithun, pigs and fish are consumed. No wild animals are consumed in the marriage.

IV.1. (vi) Festivals

'Reh' and 'Keh-meh-ha' are the two important festival of Idu. Reh is celebrated during the month of February. It is the festive of three days. In the first day guest is welcome. In the second day Mithuns are sacrificed. In the third day pigs are sacrificed. The worshipping is done by sacrificing the animal. By sacrificing the animals, they ask the spirit for the well-being of the society. The animals are slaughtered according to the status of the people. It is the time where all the family members gather. However, with the passage of time the importance of personal Reh is getting decreased. Younger generations are not willing to spend a lot of money on doing individual household Reh. That is why the community Reh is conducted by every village where all the villagers comes together and celebrate the festival. The most important seasonal agricultural festival of the Idu-Mishmi is known as "Keh-meh-ha" (Keh-means- Rice, Meh- New, Ha- Eating). It is a festival of first seasonal harvesting crops like paddy and various others. This agricultural festival is celebrated in the month of

September. Like Reh, every village celebrate Keh-meh-ha were worshipping of the goddess *Apeh-milli* and *Apeh-Gonglo* for the prosperity and rich crops during the harvesting season. In this festival too the mithun and pig are sacrificed to deity.

PlateIV.3:

'Reh' and 'Keh-meh-ha' Festival



Source: Field survey

It is observed that sacrifice of animals is compulsory in any occasions, rituals and festivals. The fact is only the domesticated animals mainly Mithun and Chickens are allowed to use in every occasions. All the rituals, taboos and festivals directly and indirectly control the hunting by not allowing the wild animals to set in the menu of any cultural festivals. Since the existence of Idu-Mishmi in Dibang. The hunting has been regulated by the cultural institutions of the society which is protecting the wildlife.

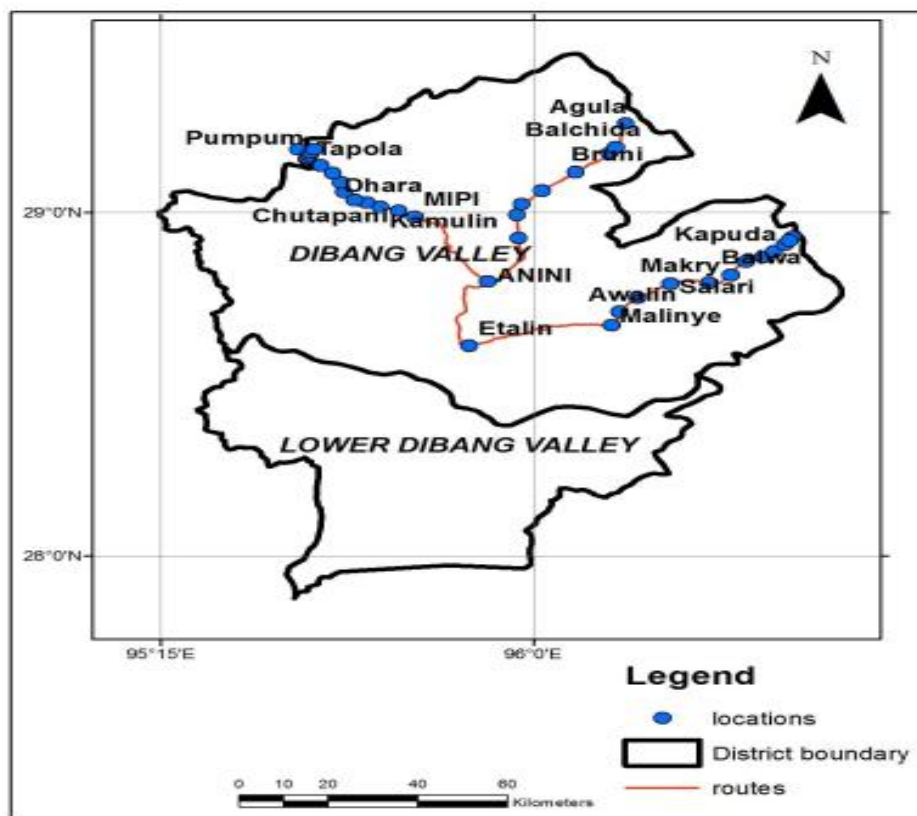
IV.2. The Space Relation: Understanding the relational space of Idu-Mishmi

Relational understanding of space conceive space as an active and subject to change, as something that is produced and constructed by people through social relations and practices (Kitchen, 2009). Generally the Dibang Valley is imagined as a secluded space where the Idu community used to sustain with absolute independence. At any point of time Dibang never became absolute space. It was easier to have a trade relation in both the undermarketednation-state. Idu used to have a barter in sadiya valley in Assam. But Tibet

becomes easier to excess through Dibang. It takes only 5 days of trek to reach the Tibet. On the other hand, the sadiya could be accessed in a week through the porter’s track.

As shown in the map IV.2 there are three routes from Dibang through which the people can reach to the Tibet. The hunters encircle the entire area touching all the three routes. There are four passes to Tibet 1 Zakenla and 2 Andhrala, towards the Mathu valley 3Agula, towards the Dri valley and 4Kayala pass towards the Maliney in Taloh valley.

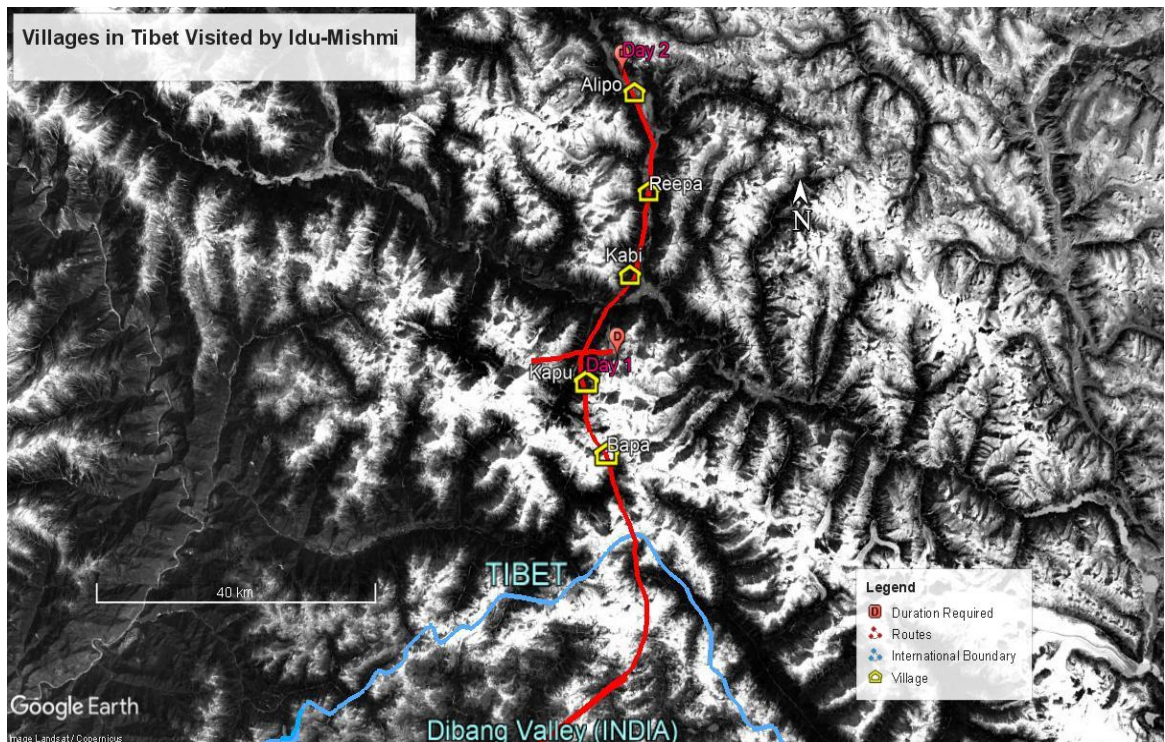
Map IV.2: **Traditional Routes to Tibet**



Source: Compiled after Interviews; Map prepared using Google Earth Pro

There were no physical or imaginary borders for the people of both the nation. From both sides people used to come for varied purpose. Idu-Mishmi used to go to the Tibet for the purpose of barter and the Tibetans used to enter the Dibang for hunting and especially for the pilgrimage purposes. The younger generations don't have the knowledge about the areas in Tibet which their grandparents used to visit. Limited number of people could narrate the stories of Idu-Mishmi and their relationship with Tibet. Sille Milli, 85 years old person from Acheso village narrates his experience about Tibet.

Map: IV.3.



Source: Compiled after interviews; Map prepared using Google Earth Pro

“I used to go to Tibet by myself and also along with army. It takes 5 days to reach Tibet. After reaching border we used to walk for 2 days inside the Tibet. I visited twice in my life time. During that period China occupied Tibet. The things were not similar after that. We were recognised as Indians through our look. I still remember Tibetans used to call 'KomitaKothaita' to China. We four of them went there. All of them are no more. I am the only one who is alive in that group now.”

Mr. Sille was very small when the influence of India began in Dibang. Presently they can't go to Tibet. Earlier, they used to stay in the villages in Tibet and did barter with them. Valuable goods from herbs to the skin of animals were bartered. They used to go and stay in the villages in Tibet. Till recent Idu-Mishmi used to cross the border and enter into the Tibet while going in the long hunting trip. However, at present none of the Idu-Mishmi crosses the border in the fear of being caught by the Chinese army.

There is a lot of similarity between the two different regions. Idu-Mishmi *Igu* priest were well known for their power. They were invited to perform the rituals. Among them it was Sinu who was well known *Igu* in going Tibet to perform the rituals. Such relationships have

been discontinued due to the involvement of two powerful neighbours (India and China). Everybody is warmly welcomed by Idu. This aspect of culture still exists in the area. Like everyone Tibetans used to come to sell their mithuns and other goods. They used to stay couple of days once they visit the area. However, the milder climate and rich natural resources of Dibang attracted the Tibetans.

Plate IV.4: **Mani stones: sign of Tibetan's presence in the Dibang Valley**



Source: Field Survey

Plate IV.5 are the Mani stones¹¹ found in the two different villages Mipi and Mihundo in the Dibang. These two village are located in the two important valleys, Mathu and Dri. These Mani stones are the sign of the presence of Tibetans in Dibang. They settled for over a year in the village Mipido, Brango, Elombro, Mihundo. During that time, they kept many stones under the tree in Mipi. Later the General Reserve Engineer Force (GREF) workers have made a temple through it by keeping the trident, bell and making a small hut in it. In the beginning Tibetans and Idu started living in a harmonious manner. Later Tibetans tried to control the area and started restricting locals in hunting. The local people started feelingsuppressed by outsiders which was completely disliked by Idu. Therefore, they planned to throughout the outsiders from Dibang. There are narratives which can help to

¹¹Mani stones are stone plates, rocks and/or pebbles, carved or inscribed with the six syllabled mantra of Avalokiteshvara (Om mani padme hum, hence the name "Mani stone"), as a form of prayer in Tibetan Buddhism.

understand the incident in a much better way.

Clash over hunting between Idu-Mishmi and Tibetans

This story is old in the beginning of 1900's, I guess. Tibetans used to come to our area and stay a couple for many days. After sometime they planned to stay permanently in our area. The village head *Jibi* allowed them to stay in our area. There were many Tibetans in Mipi, Elombro, Brango, Mihundo and Gipulin. In the beginning we shared a harmonious relation. We found them good and allowed them to stay with us. After few months they were changed and they started behaving like locals. They started suppressing our people. They started restricting on hunting by our people. They once came and warned our people by saying we found arrows in the area of *Akru*. Repeatedly we are saying not to hunt but why you people are hunting.

Idu started feeling suppressed now. They started to think we are the indigenous to this area and how can the outsiders rule us. We have to throw them away from this area. They had guns and good weapons; we didn't have any such things. But we had man power and will. The people from lower areas were also invited to drive away the Tibetans. We could have not won the war only through weapons. Will and technique were the key.

The Tibetan Lama used to stay in three storied wooden bungalow in Mipido. The lamas went for hunting in the high altitudes. Idu planned to attack the Tibetans at night in an absence of the male members. Idu burned their houses and the people who were inside the house were not allowed to come out. Many died inside the house. The battle between the Idu and the Tibetans took place. The Idu killed lots of Tibetans in that battle. Many Idu also lost their life. The people who were alive went back to Tibet.

Field Interviews, August, 2019

After 1962 India-China war Tibetans once again came to Dibang valley as a refugee. After allowing the refugees for two months in Anini they were send to Tezu in Lohit district and settled them in a Refugee camp. At present there are still lots of Tibetan lama in Tezu. However, pilgrims still come to Dibang Valley to worship the mountains, lakes and the valleys. Every year in the summer at least a group of 40-50 people come to worship.

According to locals in every season Tibetans come with 15-20 people in a group with huge rations. They use to stay in the jungle and hunt different species. Hunters narrated the stories of many incidents in the jungle with the Tibetans. In the jungle they meet each other. The language barrier stops them to have a communication, despite they communicate through the sign. The sharing of food and cigarettes are done when they meet each other.

The Border has created the barrier as the two different space. There is barely any regular

communication and exchange between Idu people across the border. At present none of the Idu goes to the Tibet or has any kind of business relationship among the Tibetans. Tibetans occasionally enter India also for hunting. According to the people from other side of the border enters Dibang Valley. Their group composed of 20-30 people who come with huge rations. They stay in the jungle and hunt different species.

The Idu-Mishmi who were closely communicated with Tibetans and also interacted with the people of Assam. With the passage of time the area has been transformed through the socio-political, economic, different kinds of developmental schemes and the notion of wildlife conservation. There has been seen the debate among the academicians and wildlife conservationist in terms of hunting done by the Idu-Mishmi. However, the cross-border hunting done by the Tibetans are continued and which are discussed too little.

IV.3. Animals in the Idu-Mishmi Ecology

Ecology, as one of the biological sciences, has its own set of questions concerning species populations, communities of different species, their habitats, etc and has scientific procedures for gathering and regulating answers (Vital, 2005). Human-being are the sole part of the ecosystem who are often overlooked in such studies. The reason after the negligence is because local people encompassing the protected areas are considered as the barrier for the success of wildlife conservation.

Whereas, the tribal communities have been displaced, often brutally from their ancestral forests, fields, and livelihoods to make way for one big project. When they have resisted, there are innumerable cases of such incidents, they have been physically assaulted and sometimes killed by forces of the state that are meant to protect them. The tribal policy and rights often get discussed for their negative impacts on conservation, little if ever, is discussed on the lines in another context (Sekhsaria, 2007).

To understand the human-animal relationship we need to comprehend how the society imagine the nature and animals, including what is the place of animals in cultural

institutions of the society are needed to figure out.

IV.3. (i) Beyond the 'economic' animals

In Idu-Mishmi society animals supported people beyond the livelihood and economic systems. Animals helped to maintain social position of every individual. Idu practiced of making slave (*Apoo*). Mr. Jongo Tacho from Kongo village explains how slave are made in Idu community. “Our people used to make *apoo* to the people who are very lazy and don't want to work. They are never treated like slave which are imagined very differently when we hear the term *apoo*. They sit with us, they eat food in the same plate, but he has to work as instructed by his owner. Slave never mean that we go in some other areas and hijack people. We make *apoo* to the people from our own community. Those people includes neighbour or among the clans.”

He further explains *apoo* is not made according to the clans. His surname is Tacho and the *apoo* can be from the Tacho family. Idu do not believe in practice of untouchable and restrictions on the *apoo*s, they stay together. Only the marriage is not allowed with the slave. If a person marries slave than he/she will be included under the category of slave.

In early day's males mostly used to get engaged in hunting because hunting was all in all for the person's livelihood. The person who are great hunters were highly praised and honoured by everyone. He becomes the richest in community and the clan. Weaker people who don't have knowledge of hunting and other skills were made *apoo* by the powerful person. *Apoo* is not brought from somewhere else, mostly they are among own family members. Once the person is declared as *apoo* than the forthcoming generation are also given the tag of *apoo*. The slave clans live a normal life there. Although during the decision-making process they can come and attend the assembly but are not allowed to participate orally in such matter.

For survival everyone was required to work. There was a scarcity of resources, no people could remain ideal and pass the time. There was scarcity of the people to work. People who

were not willing to work in the foraging activity and barter were made as a slave. At present no people are made slave. However, the people who were stated as the slave have remained unchanged and are still in steady process of change in the social systems and their identity.

IV.3. (ii) The 'symbolic' animals

In Idu-Mishmi culture meat becomes very essential part in everyday living. In festivals, ceremonies, in everysmall and big rituals animal are required. In marriage, funeral, or in every household ritual and even when guest comes in house than at least the chickens are offered. During the marriage the bride family demands the Mithun and *Elli* Pig. Bridegroom has to fulfil the demand. The tradition was also there to send chickens head to all the people who came along with bridegroom but now people don't follow this culture.

The consumption of meat is equally followed in the *Aaya* funeral. When someone die, the relatives, villagers and people from outside comes to help the family. They give cash, mithun, pork and chicken because meat are distributed to people who comes to attend the funeral. The meat is also required to be offered to the corpse. Idu-Mishmi spends a lot of money in funeral. Chickens are required to sacrifice chicken in every occasion by believing that all the problems, evil spirits, will be taken away by the chicken. Chickens place is most important because it is believed that it can fly and take all evil spirit away.

In the Idu-Mishmi culture occasions become incomplete without the meat. Aiyadurai, while studying the wildlife hunting by the indigenous tribe of Arunachal mentioned that in the tribal culture the meat is required in every occasion. A part of food and cash-income the rituals and festivals are reported as the main inspiration of hunting. The demand for meat gets increased during the cultural festivals and in occasions (Aiyadurai, 2010).

On the other hand, it contrast with Idu-Mishmi culture. Wild meats are not allowed in the menu of cultural festivals or in any kind of rituals. There is a taboo to mix the wild meat with domesticated one. Among all the animals Mithun and chicken are required in every ceremonies and festivals and are highly valued.



Source: Field survey, August, 2019

Mr. Junti Mikho from Kongo Village explains the importance of Mithun to the Idu-Mishmi. He says, “People say 'Tiger' is the most important animal but I say 'Mithun' is the most important animal. Even if a person has crores of rupees, car, bungalow, or a huge plot of land, is incomparable with the person having Mithun. One who slaughter much of the Mithoon is the biggest and the man in this area.” Practically, Mithun becomes the most important wealth in the Idu-Mishmi culture.

Late Shri Tade Tacho is famously known for his record of organizing Reh festival at household level for nine times, the highest by any Idu-Mishmi, till today. Every individual from the community has a dream of celebrating the individual Rey. It is the utmost aim to attain the Nirvana. When the personal Reh is done than all the relatives, the people from different clans are invited. They should present the meat, wine, money and the good hospitality to all the invited person. The sacrifice of mithun is done according to the person’s status. There is a record of cutting 312 mithun and 81 pig in a single day. In the year 2017, 108 mithun were sacrificed in single day.

Young people from Idu-Mishmi community are losing their interest in observing individual household Rey. They say individual Rey means we have to be ready with minimum twenty lakhs. Today price of a Mithun is 50,000-80,000. They question what the use of wasting so

much money is. They are not totally rejecting the concept of Rey but are criticising the big budgetary rituals. Regarding every old people are worried about the continuation of their traditional way of observing the Rey.

In the festivals and ceremonies only, the domestic animals become the 'meat animal'. Mithuns are placed as the most important animal among the Idu-Mishmi culture. However, with an idea of wildlife conservation and government policies for creation of Wildlife Sanctuary and Tiger Reserve the concept of eco-tourism has been stick in the mind of young people. Therefore, Takin and Tiger becomes the symbolic animal for Idu-Mishmi. Because Takin being an indigenous to Dibang Valley is helping the area to be better known in terms of heritage site of nature which will soon boost their economy with tourism related activity. It will in the slower process reduce cultural hunting among Idu-Mishmi.

IV.3. (iii). Idu-Mishmi and wild animals: (protected or exploited)?

Participating in the everyday living with the Idu-Mishmi community helped to understand how they imagine the nature and animals. The attitude of people can bring both positive and negative results in terms of wildlife conservation. In the jungle of Dibang Valley onelabour from Nyishi¹² community described the Idu-Mishmi while talking about the animal hunting. "Idu are very lazy people. There are lots of resources like Musk Deer, Bear, Tiger but this people never hunt. If we were in their place than we would have become so rich and rule the area. But this people say we can't hunt this we can't that. If I would have been in this area than I would have kept more wives." There are many communities in Arunachal Pradesh where slavery is practiced. One among them is Nyishi community. Nyishi labour said, "I had six wives and two among them died." Sulung¹³ are the slave of Nyishi. Community who

¹² The Nyishi community is the largest ethnic group of Arunachal Pradesh. They are found in western part of Arunachal Pradesh and they are across eight districts of Arunachal Pradesh. KraDaddi, KurungKumey, East Kameng, West Kameng, Papum Pare, parts of Lower Subansiri, Kamle and PakkeSesang district.

¹³ Sulung are the backward tribe from East Kameng district in Arunachal Pradesh who has traditionally been slave to other stronger tribes of the region.

keep slave try to produce more children so that dominance can be maintained. Nyishi sends Sulung people as a labour in Jungle for hunting. They have to give half of their earnings to Nyishi. In Dibang Valley both Nyishi and Sulung come for hunting and they hunt all the animals. Because hunting is source of income and leisure activity.

Scarcely ever any Idu imagine the nature in this fashion. Mr. Emuko an eminent priest *Igu* explains how they perceive nature and every wild creature. “We have a *gyeana* taboo for every wild creature. We have divided territory for hunting animals. When we divide mountains and rivers as the territory that means we have divided our *Golo* (Idu-Mishmi spirit where locals believe that the mountain, river and wildlife belong to him). That is why we have the creator *Maselogini* on the top. We never divert rivers because the *Golo* follow same route. Hunting *tambreoo* and fishing *angaru* is done seasonally. “If we exploit the resources than our spirit will definitely destroy us and our entire family.” Emuko Miu, Male, *Igu* Priest, Maronli village.

Mr. Kanki Miri from Elambro village who often time go to the jungle narrated one of his incidents for more than five times. “We went towards the Mathu valley last year. There was a huge group of Takin. I thought of shooting one. I fired one shot but it missed the aim. I fired another once again I missed it. In the third round I could hit the forehead. When I reached nearby the dead Takin, I saw the one lying dead and went closer saw the third one too. It was the first time I did that.”

In the similar fashion one prominent hunter Mr. Eta Miu from Maronli narrated his incident of hunting. “I saw a huge group of Takin but I didn't hunt it. I was alone in the jungle so thought it will be wasted if I kill such a big animal. I came little down and hunted one *Maren serrow*.”

Wild animals are actually the ‘feared’ animals among Idu Mishmi community. People do not hunt tabooed animals. There are pre-existed rules that is set up by the religious institution of the society. The animals which can be hunted and which cannot have been

already mentioned. These unwritten rules are passed away generation after generation and are followed by every individual from the community. In the jungle people have to offer everything to *Golo*. When they hunt the animal, copper is given in right ear of the hunted animal. When something is cooked it must be offered to *Golo*. If someone does not follow such basic rule than it is believed that *Golo* will definitely get angry.

Plate IV.6:

Cave is restricted to Menstruating Female



Source: Field survey, August, 2019

Females have to follow much of taboos not only for food, in addition they have to observe more taboos in the jungle as compared to male. When local people go to the jungle, they prefer to stay in the rock caves because it will protect them from cold and precipitation. In the high-altitude area, it acts as the natural shelter. The people renovate it with the help of tarpaulin and mosses. During field survey Achili Mihu was assisting to go to the jungle. Her *Nabaliya* uncle Mr. Anda Mihu was ready to be the guide. But the trip could not become possible according to the scheduled date.

At this moment Achili started thinking deeply because her menstruation period *Andhruge* was coming near. It is a taboo for females to stay in caves and eat wild meat. I believe that the female during menstruation period are not pure. Caves are believed as the place where the *Golo* lives. Wild animals are the creatures of spirit. For all these reasons females are not

allowed to eat the wild meat and stay in caves during their periods. During periods hunting cannot be done and female avoid going to the jungle.

Plate: IV.7. **Pochi the traditional method to chase away the animals from the crop field**



Source: Field survey, July, 2019

There are many such traditional system which helps animals to be protected. One among them is *Pochi*, the traditional method to chase away animals who comes to raid crops. *Pochi* is made with bamboo and a bucket. The natural water with support of bamboo is connected with a bucket. The bucket is tied in large bamboos. The other rope like bamboos encircle the entire crop field. It is attached with the big bamboo. A bucket is placed in such a way, when it gets filled, it automatically gets downwards. Small bamboo hits each other and produce an alarm call (tak-tak-tak-tak) which scares the animals and birds to come inside the field. *Pochi* reduces the farmers' effort from continuous surveillane in the crop field. It reduces conflicts between the human and animals. At present only in few villages *Pochi* is planted. Many times, hunting of animals takes place because the animal like bear and monkey raids the crop.

Mr. Jongo Tacho's garden from Kongo village found many of maize is destroyed in his garden. There were black bear track and foot prints. Bear has destroyed his entire crop and now he thought the bear should be killed because he bears got taste of maize, he will come

once again and destroy the entire crop. He stayed to watch over tonight.

He returned from the field at 1a.m and narrated, “Seeing my torchlight the bear ran away. I also ran behind him carrying gun but could not shoot him. Now he is scared, he will never show the courage to enter into my garden.” The incident between Mr.Jongo and Bear is not a planned one. He doesn't have an interest in hunting. Though had to carry the gun for protection of crop, as it becomes utmost important for any remote dwellers of the area. In current situation, no comparison shall be appropriate with an idea of 'protection' and 'conservation' of species.

While discussing the frequency of hunting it could be assimilated that how the hunting, fishing and the related activity are directed by the culture. There are many restricted areas in the jungle and nearby village called *Asano*. Some area is left for the animals and spirit. No one can enter and take any kind of resources from these areas. There is a distribution of hunting land. *Igu* should perform the ritual before cutting big trees. Mixture of wild animal cannot be done with domestic animal. Wild meat cannot be cooked with onion, garlic and chilli. Any kind of meat should not be mix with mushroom *akolo*. Female hardly consume wild meat which results in a large part of population excluded from consuming wild meat.

It can be understanding how the Idu-Mishmi has conceptualise the nature and animals and how it can be used towards the wildlife conservation instead. Such a great cultural design which is helping to conserve the nature since the existence of the community. The idea which is practiced in their everyday living cannot overlooked.

IV.4. Tiger and Takin: the animal geography of co-constructions

In the Idu-Mishmi culture the role and place of animals are not similar. There are several animals that are never hunted and among them it is the tiger that locals believe to be their brothers and they never hunt. On the other hand Mishmi Takin is also an endangered species and is indigenous to the land however, it is hunted. The question arises what kind of belief systems brings the discrimination between the two endangered species and how such

discrimination is shaping the ecosystem of an area. This section tries to understand how a socially constructed landscapes of the Idu-Mishmi is bringing the impacts on conservation.

IV.4. (i) Relationship with the Tiger

F.M. Bailey the British intelligence officer and naturalist remarked the tiger presence in the high-altitude areas of Mishmi Hills (Bailey, 1912). After the British the area was ignored by the academicians, wild lifers and related group of people.

It was March 2012 Dr. Sahil Nijhawan went to the Lower Dibang Valley district to determine tiger presence outside Protected Areas of Northeast India. One Idu-Mishmi elder told him “If you want to find a lot of tigers, you must go high up in the mountains. In the Idu culture, tigers live on tall mountains.” Scientist including him believed that a lot of tigers didn’t, and couldn’t, ‘live on high mountains’. Tigers are believed to a conservation dependent species that survived when governments and NGOs, put in active measures to protect them. There were no tiger reserves in the area, no guards and the nearest sizeable tiger population was more than 400 km away in Assam’s Kaziranga. By thinking this, Dr. Sahil took that story of tigers that the Idu elder was talking about were either fictional or unfortunate remnants of a past population. A few months later news arrived that two tiger cubs had been rescued from a dry well in a village (Nijhawan, Sanctuary Asia).

In 2012, two tiger cubs were rescued in Angrim valley village in Dibang Valley. The villagers informed the forest department and the people from Delhi based NGO (Wildlife Trust of India) came for the rescue of the two cubs. Since the rescue the area has been witnessing the conservation interventions by state and non-state actors. The area has become the research hub for the wildlife biologist (Aiyadurai, 2016).

An expeditious survey of Tiger and Prey was conducted by the National Tiger Conservation Authority (NTCA) and Wildlife Institute of India (WII). The survey resulted in capturing the first ever image of a tiger from the Dibang Wildlife Sanctuary at an altitude of 1765m at the CheloPani camp area. Tigers scat was also found at an elevation of 2065m in the Ange Pani

area. The researcher confirmed that Dibang holds a good sizeable population of tigers. The area offers with diversity of prey like Takin, Wild Pig, Goral, Musk Deer, Barking Deer, Serrow and Mithun (Gopi, etal, 2014).

Ecology based information on tiger were collected in Dibang wildlife Sanctuary. 108 cameras were kept in 336 km². A total of 42 left sided photographs of the tigers were recorded. 11 unique individual tigers including two cubs were identified. Two males were captured at the height of 3,246m on May and January 2017. Dibang becomes the highest elevation range to capture the tiger in India (Sharma, 2018). Idu-Mishmi and Tigers are banded together. Idubelieve the tiger is their brother from the same mother. They worship it and are never killed. There is a folklore which helps us to understand the Human-Tiger relationship.

'Idu-Mishmi's Folklore of 'Tiger'

As per the folklore Tiger and human are born from the same parents. The tiger was born two days before the human. After sometime the tiger disappeared from that place. However, the human met the tiger when he went for hunting. We both of us hunted the animal. What human said the tiger, let us go for the collection of firewood and we will eat the meat after cooking. No, said the tiger. Tiger said I have to eat the raw meat and also the raw blood. My stomach is getting very hot I don't need to cook I will eat the raw said the Tiger.

After returning human complained to the mother saying our brother is eating the raw meat and one day, he may eat me too. Mother thought her son is saying the truth. She made a competition between her two sons (tiger and human). The one who cross the river will kill the other one. The tiger is the great swimmer he started swimming and reached the middle of the river in no time. What mother did was, she kept the ant inside the bamboo and poured the ants into the body of the Tiger. Tiger wasted his time to clean the ant from his body. The human went through the wooden bridge and crossed the bridge before tiger and shot him with an arrow.

After that we have demarcated the territory of the human and tiger. We never kill tiger after that. Even if the tiger dies through an accident than the priest is required to take care of the soul by performing the rituals. It is believed that if the ritual is not done than it may destroy the hunter and his entire family. It will burn the house, or bring the landslide, the person will suffer from different disease and die; accident and suicide will definitely happen often even after ritual the evil things continue to happen. That is why we save the tiger. Intentionally we never kill the tiger.

Emuko Miu, Igu Priest, Maronli village

(Aforementioned) everyone illustrates that they never hunt the tiger. Despite the fact to have a deep insight the similar question on tiger and hunting was put forwarded to everyone. Many time interviewees responded in a very sarcastic way, “you are doing research in this area and you don't know tigers are our brother and we cannot hunt it.” People from all age group in every interview were very static with the answer.

Plate: IV.8.

Tiger teeth's Garland Used by Priest



Source: Field survey, June, 2019

A question always lingers in mind, all the *Igu* priest need *Aamala*¹⁴ during the rituals *but* how do they manage to get the tigers teeth? Interaction with many *Igu* could helped to understand the matter. One of the renounced *Igu* Mr. Emuko Miu responded, “*Igu* carry the tiger's teeth during the time of rituals but this teeth are age-old. The common people cannot wear the *aamala*. When *Igu* is retired than he passes the *aamala* to his successor. My family, my children cannot touch this *Aamala*. The *aamala* was given by much renounced *Igu*.”

When the questions on tigers were put to the young group of people a kind of fear and worry encircles in their mind. Very few were familiar with the story of tiger and an incident of killing it. Renga Umbrey from Cheppe village, responded, “What kind of question you are putting up. No one hunt the tiger here.” People were uncomfortable to take such questions.

¹⁴ *Aamala* is a Garland made up of Tiger's Teeth used by Idu-Mishmi Priest

They used to get afraid to speak something wrong about Tiger. It was found that people never speak upon tigers and evil spirits in evening. When questions on Tiger was asked to Mr. Rajiv Milli from Acheso village, he said, "I have never seen it and neither have I wanted to see it, 'he pshawed' by saying what I am speaking in the evening." Talking about the tiger killing is a big sin in the Idu Mishmi culture because it is highly prioritize animal which has a strong *gyeana* due to which people are afraid of the animal.

Even the active hunter narrates the story of tiger which never relates hunting. One old person reveals the complexities between the human-tiger relationships which helped to get the answers when the questions were formulated through different way. One old person Mr. Tacho from Eatabe village said during my grandfather's days, tiger were hunted when it became necessity but we cannot hunt now.

What he meant to say was tigers cannot be hunted because it is their brother. People never hunt the tiger like other animals. But sometimes people are bound to do so. For self-defence sometimes in such situation it is required to hunt, sometimes it falls into the trap, if it kills lot of mithun than people do kill tiger. **'But they cannot hunt now'**.

When tiger dies it is believed that soul will harm the hunter and his entire family. However, earlier *Igu* priest used to be very powerful. They could control the soul of the tiger. People narrates incidents like even after doing rituals the house of the hunter get burned, they are drowned in the water, they get mental illness, they and their children commit suicide, entire family gets destroyed. The faith on *Igu* in doing rituals of tiger has been reduced. Today *Igu* are believed as less powerful person to control the soul of tiger. Ritual of tiger *Tamama* are believed as the most dangerous because *Igu* will also suffer when ritual are not performed well. When tiger is killed than rituals are needed to be done which is similar to the rituals done in funeral. The whole village has *gyeana*. People can't go to the agricultural field because humans and tigers are from same mother.

When the tiger is dead no one can touch it without *Igu*. There are four big teeth of the tiger

and among four hunters have to give two teeth to *Igu*. Earlier hunters used to sell the skin in Tibet but, however now it is not done. Tiger and Black Panther among cats are top prioritize animal. Even if it gets killed in an accident than hunter has to follow a year of *gyeana*.

Narratives and stories reveal that tigers are among the top prioritize animal. It has a very strong and treacherous *gyeana* taboos. However, the question of fact is, are the '**tiger adored**'? This question is very much important to understand, who are 'conservation actors'? The western ideas of conservation (or) the cultural values which are helping the tigers and other living creatures getting conserved in the area. The one liner from the narratives of the interviewee can help to reach towards the answer.

- a) "Our mithuns are killed by the tigers. We can't kill it because of the *gyeana*. But I don't understand the point why do the government don't kills it." Tocha Mipi, Mipi village.
- b) "I don't like tiger it kills our mithun." Tacho, Etabe village.
- c) "It will be good if the tigers will vanish from the area because it destroys a lot." Sille Milli, Acheso village.
- d) "Tiger is the highly prioritize animal in our culture. More than tiger it is Black Panther who is the most dangerous animal but tiger, it destroys a lot. In winters it enters into the area of mithoon." Emuko Miu, *Igu* Priest, Maronli village.
- e) "Takin is the meat animal; but tiger, we can never kill tiger, it's a big sin." Chisa Miu, Maro village.

The above narratives reveal the fact that the tigers are not adored, it is the feared animal. It is the taboo which is helping the tiger to be conserved in the area. Even after the damage done by the tiger the people don't dare to hunt it out of the fear. Willingly or unwillingly the tiger is protected in the land of Idu-Mishmi. On the other hand, the government is pressing hard to create the Tiger Reserve in the area. An approach towards the nature and wildlife conservation are at the verge of transformation. Overlooking the traditional way of conservation and creation of the Tiger Reserve means following the western idea of conservation which will overtake the traditional way of conserving the nature and wildlife.

IV.4. (ii) Idu-Mishmi and the Mishmi Takin

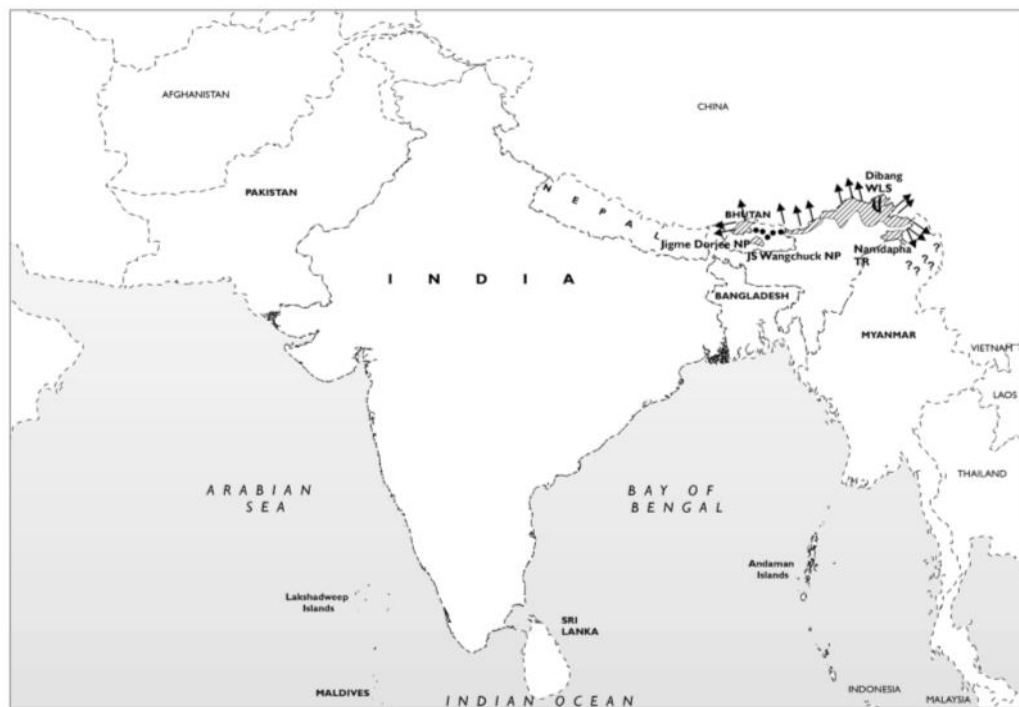
Takin belongs to the family: Bovidae, Sub-family: Caprine and it has four Sub-Species, namely – i) *Budorcastaxicolorbedfordi* (Golden Takin) (ii) *Budorcastaxicolor tibetana* (Sichuan takin) (iii) *Budorcastaxicolorwhitei* (Bhutan Takin) (iii) *Budorcastaxicolor taxicolor* (Mishmi Takin). Takin occurs in Bhutan, China, South eastern Gansu, Sichuan, Shaanxi, Southeast Tibet, North-East India (Arunachal Pradesh and Sikkim) and Northern Myanmar. (IUCN, 2008).

The Takin is elongate and deep in the chest, with greater height at the shoulder than at the hip; the limbs are strong and stout, especially the front legs below the knees. The muzzle is attenuated and deep dorsoventrally, giving the animal a distinctly Roman-nosed appearance.

The tail is short, triangular and naked on the underside (Neas, 1987).

Map.IV.4.

Distribution of Takin in South Asia



Source: Sharma, D., &etal. (2015). Takin, *BudorcasTaxicolor*. *Mammals of South Asia*

Takin is restricted to specific habitats throughout its distribution range. The four subspecies of Takin occur in three separate areas in the West- Central region of China and along the Eastern Himalaya. Mishmi Takin (*B.t.taxicolor*) occurs mainly in the Mishmi Hills of

Arunachal Pradesh (India), Kachin state of Myanmar and Bomi-Zayu region of south eastern Tibet (Sharma, 2015). Mishmi Hills in Arunachal Pradesh is the region where takin can best be seen (Menon, 2014). Generally, Takins are known to occur in the steep mountain forest above 1300 meters, and migrate to the sub-alpine and alpine scrub zones up to about 4000 meters in summer (Sharma, 2015).

IV.4.b.(i) The Rapid Field survey of Mishmi Takin (*Akru*)

The rapid field survey of Mishmi Takin was carried out in two different years and two different seasons. Trips to four different locations were made during January 2017 and September 2019. It was very important to understand the indigenous knowledge related to the species and what is the place of *Akru* in the Idu-Mishmi culture. The hunters and the frequent jungle visitors were interviewed to figure out the queries related to *Akru*.

Everyone was sharing their views and narrating their experiences related to Takin. Locals use the term *taklapahad* which they mean in the alpine area where takin can be found. In summer Takin stays in large herds. In winter due to snow-covered mountains takin comes down in the lower elevation areas. They hide themselves in thick vegetational areas and in slopy terrain. In winter they can be sighted near streams and salt lick areas where they come to eat salt and drink water. Routinely *Akru* use to visit salt lick areas to eat mud. They use to visit in a week, in fifteen days or in a month.

Akru become active in the morning and in evening. They are both grazers and browsers. *Mooh* is the call made by the *Akru*. The size of the male is bigger than female. The face of the male is little blackish but females are brownish in colour. Calf stays with mother. In between February and April, the offspring of *Akru* are born. Tiger, leopard and wild dog are the predators of *Akru*.

It is believed that because of the tug of war between the *Golo* and Idu, hunters did not follow the *gyeana*. Forever after there is no strong taboo on hunting takin. People don't have to follow a strong *gyeana* on *akru*, unlike other animals they have to purchase the *akru*

from the *Golo* by offering copper in the three different parts of the *akru*. One in the right ear, one in the right shoulder and the last one in the right hoof of *Akru*.

Plate IV.9: Wall of a typical Idu-Mishmi House adorn with horns of hunted animals



Source: Field survey, August, 2019

Aafuyu the copper offering rituals is done with the three different parts of the body. At first the right ear is cut and copper is offered in the name of *Golo* and placed in the soil. This is done in the same spot where the takin is hunted. The remaining rituals are done in the first rest point after carrying the takin. The right side of the shoulder is cut and is offered after putting copper in it. After this in the same area the hoof of the takin is cut off and the copper is inserted in it. The hoof is placed in a standing position.

The wall of the Idu-Mishmi clearly reflects the significance of takin. The meat is highly valued. Thereafter understanding the place of takin in the cultural institution of the Idu, trips to jungle were made to observe the takin in its habitats. Expeditious survey was made in the two different seasons to understand the takin's habitats and hunting.

IV.4.b.(ii) The winter expedition

Takin changes its natural territory according to the season. In summer it stays in the high altitudes and in winter due to the snow cover mountains it migrates in the lower elevation areas. In winter *akru* can be sighted at the distance of one day walk from the village.

However, there is a very less possibility to have a direct sighting. One has to camp in the jungle and wait for it in the waterhole areas where *akru* often visit.

Plate IV.10: **Habitat and the sign (hoof marks and dung pile) of Akru Mishmi Takin**



Source: Field survey, January, 2017

The first field observation was made towards the Dri valley area. After marching forward from the Apremo camp there could see the fresh dung pile and the hoof marks of *akru* [plate IV.7: image (b) & (c)]. On the lateral way of stream at the height of 2637m the sign of *akru* was found. The next trip was made towards the Mathu valley and Eta Miu the expert in this area was ready to be a guide in the trip. The track to jungle starts from the village Maronli. Hoof marks and dung pile of *akru* at 2555m of elevation [plate IV.7. image (d)]. The dry droppings reveal that the animal already move out from the area.

Another trip in the same valley towards the Mipi village. After walking for six hours from the village dung piles of takin was found in cliff at the height of 2494m [plate IV.7. image (e)]. Here also the dry dung pile and the old hoof marks were spotted.

The observation in the three different direction in winter reveals, even if in winter, takin select its habitat in the lower elevation areas but there is restriction in its natural territory. During the field survey in the month of January the sign could not be sighted below the elevation of 2400 metre. In winter they are forced to come down and forage for food due

to the snow-covered mountains. Unless and until the snowfall don't becomes acute takin won't come below 2000m of elevation.

IV.4.b.(iii) The summer expedition

Hoof marks and dung pile was recorded at an altitude of 2700m. It is the time for the Takins getting into the lower elevation. At this height few more hoof marks and excreta were seen. Towards Ruwa-II, a group of 15 takin could be sighted towards the cliff. Ruwa-II is the last base camp situated in an altitude of 4107m. After many days of search takin could be sighted directly at Ruwa. Ruwa is a crossing zone of takin, who every time prefer to take the same track.

Plate IV.11:

Herd of Takin in Ruwa



Source: Field survey, September, 2019

Even after many days of search the direct sighting in the second time did not happened. The animals started moving in the lower elevation area. Encounter rate of takin in the winter are very rare due to which the hunting is very less. In winter takin roam in a very small group which is composed of three to five numbers. Males are solitary. Hunters have to wait in the waterhole and salt lick zone to have a direct sighting of takin. However, active hunters are highly experienced in every corner of jungle. They carry the gun along with them which makes hunting much easier as compared to the past.

In summer towards the Dri, Mathu and Taloh valley are the areas in Dibang Valley where

takins can best be seen in large group. Single group composed of 50-100 number of Takin. June/July/August and September are the month where takin can best be seen at. In addition, it is hunting season of Mishmi Takin. Hunters goes and stay in the jungle for a longer period in search of Himalayan Musk Deer *Aala*. During that time hunters carry a limited food which are composed of rice, salt and few quantities of dal. They are totally dependent on wild animals. In the alpine region takins are available during the Musk hunting period. Therefore, takins become the easier animal to hunt.

During patrolling huge group of militaries along with porter goes till the border from all the three major routes which connects the Tibet. During patrolling takins are hunted for the survival purpose. The hunters of takin have been included by the plant hunters who stay for much longer period than the locals. Those people hunt takins during the collection of the medicinal herb. As compared to the past the players to hunt takin got increased. The reason behind is due to the inclusion of the outside plant hunters who has camped inside the forest. These labourers' hunts takin and store the meat dried for the future use. The outsiders are not allowed to enter into the jungle now. Takin is protected when 'only' the traditional hunting existed. The population of the animal will still unharmed when the traditional hunting is continued.

Government needs to give preferences to conserve the traditional hunting system in Dibang. The outsiders entering into the jungle must be stopped. Not only the hunters but the consumers of the meat should not be overlooked. It is found that much of the demand are made by government employees as well economically uplifted class who don't hunt. Hence, becomes the additional source of earning for those poor living close to jungle.

IV.5. Governance and hunting landscape: Contrasting ideology on Conservation

Inhabitants of Dibang Valley are guided by the local tribal cultural values. However, the interventions from the different institutions is bringing change in the traditional way of living. People started moving outside the district to acquire education, jobs, for the medical

issues, doing business and so on. After 1960's the non-locals from the different areas have been staying in the Dibang Valley. Shopkeepers and labourers for housekeeping and other sort of activities are brought from the nearby areas of Assam and other part of Arunachal Pradesh. After the settlement of military in Dibang Valley many labourers were brought in the district. Among them the people from Nepali community has been working in the General Reserve Engineer Force (GREF). Many people have settled since they come to the Dibang Valley. People have become fluent in speaking Nepali. Military people who stays in the area made the people learning Hindi and today it has become the lingua-franka among the Idu-Mishmi.

All the above-mentioned factors have brought a change in the entire landscape of Dibang Valley. However, government policies are bringing the major change. The natural space identified for the purpose of conservation, protection and recreation of the reserve forest, parks, and sanctuaries and as tiger reserve. Unfortunately, the aim could not get accomplish. In India, the Supreme court in the year 1991 ordered all the states and union territories to identify area for the reserve forest and wildlife sanctuary (Dibang Valley Forest Department, 1996)¹⁵ All the states and union territories have identified their areas for the sanctuary but Arunachal remained at the least in identifying the area which shall be given to the government for the creation of the Wildlife Sanctuary.

In the year 1996 the letter was sent by the Chief Conservator of Forest and Wildlife to the District commissioner, Dibang Valley regarding the Dibang Wildlife Sanctuary. The letter mentioned, the Government of India is pressing hard to finalise the long pending issue regarding the demarcation of territory of Dibang Wildlife Sanctuary. He further requested to finalise soon about the existence, nature and the rights over land comprised within the limits of the sanctuary. The District Administrators of Dibang Valley submitted the report showing the areas to be taken for the Dibang Wildlife Sanctuary.

15 Acquired through the letter send from the Cheif Conservator of Forests and Wildlife to the District Commissioner, Dibang Valley. Government of Arunachal Pradesh. (9/10/1996). Provided by the RTI activist, Mr.ManMohanMihu.

However, government has to follow protocols mentioned under the provisions of Wildlife Protection Act, 1972. Ground level enquiry should be done to determine, existence, nature and extent of the land rights of any person which may be taken over due to the sanctuary.¹⁶

In case of the Dibang Wildlife Sanctuary the local people say they come to know about the notification regarding the Wildlife Sanctuary after the report sent by the District Administrations to the higher officials in Itanagar.

Mr. Manmohan, EmukoMiu, Ngasi Mena including other locals have mentioned that the local people came to know this matter when the notification was released showing the boundary of Sanctuary. Mr. Manmohan Miuadds, “To fulfil the formalities a meeting was called in Rehko, Anini. Every one opposed the declaration of sanctuary. Even after opposing, District Collector of Anini forwarded the letter. This is the 'black day' for our community.”

The newer issue has created a sense of insecurity among the inhabitants in the Dibang valley. After the camera trapping evidences of tiger in Dibang, the government wants to declare an existing wildlife sanctuary into '**Tiger Reserve**'. The people question the government, why tiger reserve? Idu-Mishmi consider tiger to be their brothers and they never kill it. They question, tigers are already protected in this area so why tiger reserve?

While having an informal talk on wildlife sanctuary and tiger reserve, Dr. Ambika reveals the prediction made by her PhD guide. She predicts: “Tigers are discovered in Dibang, very soon the area will be declared as the Tiger Reserve.” One question is, why it becomes so necessary to declare Dibang as the tiger reserve after the sightings of tigers?

There is an important criterion for the establishment of the tiger reserve mentioned in Wildlife Protection Act, 1972 and amendment in 2006 (refer again to the Appendix). There is a process through which government has to go through before declaring tiger reserve. Community should be consulted, ground data should be collected after going into the field,

16 (<https://pib.gov.in/newsite/PrintRelease.aspx?rel...> Clarification by Minister of State for Environment and Forests on Tiger Reserves, Critical Wildlife Habitats and Forest Right Act, 2006). Accessed date: 07/11/19

land issues must be checked, and the traditional living should not be overlooked. In the month of September, 2019 one meeting was called related to the issue of Wildlife Sanctuary, Eco-sensitive zone and the Tiger Reserve. Local people kept their issues related to it.

People are fearing losing the land rights because of the tiger reserve. According to them it might begin with control and slowly restriction of human to enter into the forest. Community are worried with the decision of the Supreme Court on the eco-sensitive zone. The eco-sensitive zone includes the 10 km of buffer or peripheral area where the human's activity will be controlled. Therefore, they want 'de-reservation' of the wildlife sanctuary.

While addressing in the meeting called by the Idu-Mishmi Allied Society in the month of June, 2019. Mr. Ngasi Mena who is the Founder and Chairman of POPU Heritage Foundation explained value of the place, every resource and the communities' stand on the issue related to the sanctuary. He explains, "Mountains, ridges, streams, rivers, jungle and every animals and plants are not only our 'property', it is our identity of we and our ancestors. We have a traditional method of conservation and we have a traditional right in this land. Our forefather has protected this for us and we have to handover this to our future generation." He adds, "How can they take this and declare the wildlife sanctuary or tiger reserve without our will. They want to take a hit, our entire area. In the year 1998 the notification was hidden. The wildlife sanctuary is plotted in a paper according to their own will. They played a game with us."

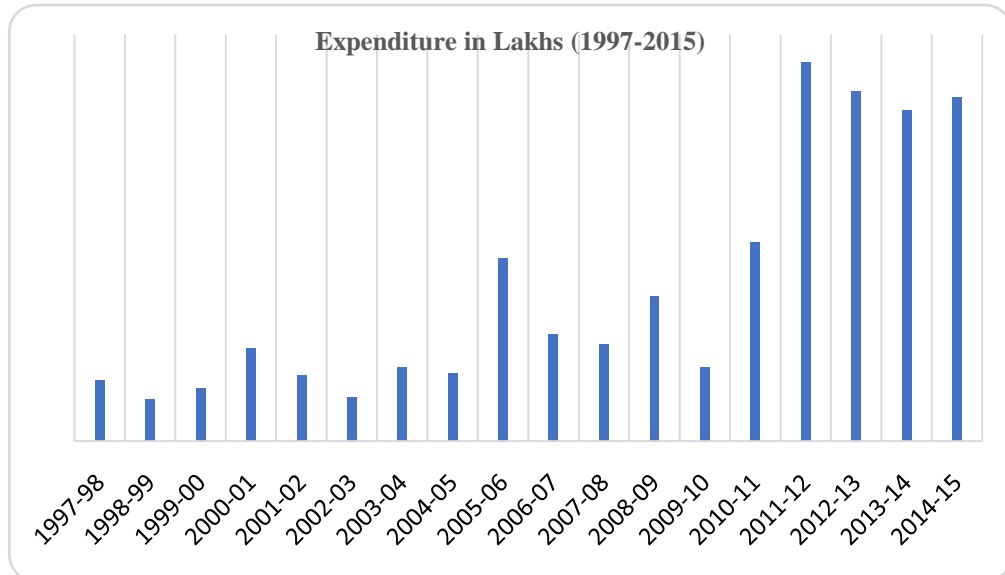
Emergence of 'issues' on Tiger Reserve is sometime viewed as an opportunity and a boon to the people because they will get a chance to speak on the disputed point. With the factual and grounded data, they are questioning the government on the existing Dibang Wildlife Sanctuary.

The data in Figure IV.1 clearly shows, from 1997-2015, 4.6 crores have been spent by the officials through different schemes. Every year officials started receiving the funds right after the declaration of wildlife sanctuary. The official record shows a plenty of work done

for the development of wildlife sanctuary. Construction of the check gate, watch and wildlife duties, creation of water holes, salt licks, watch towers, trekking path, anti-poaching camps are all absurd. In fact, the wildlife sanctuary exists only in the paper.

Figure: IV.1.

Funds for the development of Dibang Wildlife Sanctuary



Source: Dibang Valley Forest Department. Provided by RTI activist Mr. Manmohan Mihu

The bigger problem in conservation is generation of 'fund'. It is believed by all group of people that no conservation is possible without the fund. One of the important idea behind 'trophy hunting' that is practiced by many nations is for the generation of the fund 'as well'. The data shows that fund has been pumped up by the government through different schemes. But nothing reflects on the ground. So, where does the money goes? Without any work and effort if such a big fund, flows in wildlife sanctuary than how much money the tiger reserve may receive. If the institutions can do such corruption through wildlife sanctuary than how much it can be doone the same in the tiger reserve.

In this story line, the tiger reserve is for whom?

In Dibang, a 288-metre behemoth, 26.7-mile-long reservoir which is visible from the space is under construction. Already 300,000 trees are being cleared to construct the road and make a way for the dam (Kent, 2017). The project estimated to cost over Rs. 280 billion is expected to be the highest dam of India (Aggarwal, 2019). Dr.Aparajita Datta explains this issue which can be highlighted as, in Dibang the forest area to be submerged are large including

5000 ha. There are 17 dams which are proposed in Dibang, neglecting the social impact factor. In 2009, there were 130 proposed dams in Arunachal with total capacity of (38,613 MW), which by March 2013 had increased to 153 (43, 118 MW). If all the proposed dams in Dibang, Arunachal, including the other states comes up, India would have the highest dam density in the world (0.33/1000 km²). One for every 32 km of river channel where 88% of it are in species-rich ecosystems (Datta, A; Current Conservation).

Jindal Power's Etalin (Dibang) a 'run-of-river plant' wins the 2015 Global Sustainability Award by the Energy and Environment Foundation, an Indian NGO based in Delhi.¹⁷ However, Dr.Aparajita mentions the term 'run-of-the-river' is misleading. She specifies the concept of Run-of-the-river schemes which are defined as: “A power station utilizing the run of the river flows for generation of power with sufficient pondage for supplying water for meeting diurnal (daily) or weekly fluctuations of demand. In such stations, the normalcourse of the river is not materially altered.” (Datta, A; Current Conservation).

At first people were against the dam but huge amount of compensation can change the mindset of poor and unemployed masses. Compensation of (Rs. 500.40 Crores) to project affected families and state government, payment of Net Present Value (NPV) of forests, Compensatory Afforestation (CA), Catchment Area Treatment Plan (CAT) to the state government for forest lands, to secure the Forest Clearance (Stage-II) and construction of roads and bridges for accessing project site. In addition to the mandated R&R plan, it is also proposed to spend Rs. 241 crores on Community and Social Development plan and certain concerns raised by the local people during the public hearings. It is also proposed to spend an amount of Rs. 327 lakhs on a plan for protection of culture and identity of local people.¹⁸

In the current situation of the Dibang Valley the company is not willing to pay the promised amount to the people which once again discouraged masses. In this matter the local people's stand is very clear. They are not against the research and development projects. Mr. Ananta

17 (<https://www.hydropower.org/news/jindal-power%E2%80%99s-etalin-project-wins-sustainability-award>)
Accessed date: 18/11/2019

18 (<https://pib.gov.in/newsite/PrintRelease.aspx?relid=191857>) Accessed date: 18/11/2019

Meme tries to explain the local peoples stand regarding the issue of developmental projects. “Research must happen, conservation must happen but we can't compromise the upliftment of the people. The social and economic development must run hand in hand. You can't build an infrastructure destroying the wildlife and you also cannot leave people in such situation. If the company is not willing to pay the compensation amount which was promised during the clearance than our people will suffer. If this is the story than remove the dam.”

The question is not only about the how much corruption is done by the bureaucrats and politicians but the question is to the entire set of ideology and framework on conservation. On this ground, no conservation can be possible by demarcating the 'fragmented' territories to the free-roaming animals. The only option is to suture the nature and non-domesticated species with the local cultural values. In Dibang Valley such things are much easier to do when the 9000 km² of the district is dominated with the population of 1 person per sq.km.

Idu-Mishmi culture is inclined towards the protection of nature. Their traditional governance system is helping in making the non-domesticated species getting conserved. However, the external influences are bringing change in the society. The foremost impact is, dialect is getting erode. The young generation are not able to speak their own lingo. Among the communities in Arunachal, Idu-Mishmi are fluent and comfortable with Hindi.

The foreign language has lesser influence on the people who are living outskirts of Anini but very soon in the similar fashion the faraway dwellers will also get influenced. The lingua franca of Dibang will turn into Hindi very soon. Idu does not have a script. The traditional knowledge, believe systems, cultural values are passed down through the generation. Smith on study of Scots Gaelic language in Europe highlights on the importance of language. She writes, language is an integral part of the cultural identity of a group and the continuation of a traditional language is a prerequisite of the continuation of the cultural heritage of its speakers but still the preservation of languages has rarely achieved (Smith, 2000).

In Dibang it is the need of the hour to preserve the language because the Idu-Mishmi

identity and cultural values has wholly connected with the language. When language and traditional practices depart than the continuation of culture will be there only to 'protect' one's identity.

The government policies and the developmental project will bring change in the Idu-Mishmi ecosystem. The establishment of wildlife sanctuary is a contradictory between the traditional conservation system and the western way of conserving the biodiversity. The people with the sense of insecurity question the government on the reason for the creation of the Tiger Reserve. They take credit for protection of the endangered species in the area since their existence. The religion and the believe systems have regulated the hunting. The mithun becomes the most important animal which is highly valued by the Idu. It is very required in every occasion. Non-domesticated animals havean important place in the Idu society. The culture is guiding the hunters and the animals to be hunted. It is the cultural institution which has designed the number of animals to be hunted. There is a taboo in the consumption pattern too. Non-domesticated animals are not used in any rituals, festivals and ceremonies. Female can consume only the fewer wild meat. The everyday living of the Idu scale down the hunting and consumption of the wild meat. However, the new players have been involved in hunting. The government need to restrict outsiders to go inside the forest. The preferences towards the promotion of Idu-Mishmi culture should be done so that the conservation practice run hand in hand with the economic and infrastructural development.

Chapter V

CHANGING PATTERN IN THE HUNTING PRACTICES

What could be more fundamental to our sense of meaning and purpose than a conception of whether the strivings of the human race over long stretches of time have left us better or worse off? How, in particular, are we to make sense of modernity—of the erosion of family, tribe, tradition, and religion by the forces of individualism, cosmopolitanism, reason, and science?

— Steven Pinker

In the preceding chapters it is seen that Dibang despite overall change in the socio-economic systems hunting has played a key role for the sustenance of the livelihood. There could observe a lot of change in the culture of Idu-Mishmi. (Varnum, 2017) Change in culture is the change in ideas, norms, and behaviours of a group of people, over time, typically on the scale of decades or centuries.

Influence of Indian government after 1960's brought a lot of change in the Idu-Mishmi society. Deployment of military and administrative setup began. Schools were set up, for higher education people were taken to the countries capital to acquire education for free. Inclusion to the Indian government system brought several changes in terms of infrastructure such as construction of road, transport and communication networks, market towns. On the other hand, media played an important role in socializing tribal community and changed the economic activities. The overall change has directly and indirectly influenced hunting and peoples' dependent on it.

This chapter focuses on change and continuity in the hunting culture. It tries to understand complexities of hunting systems in the Idu-Mishmi society which includes change in hunting pattern as well as attempts to view the sustainability of hunting change in hunting.

V.1. Materials and methods used for hunting

Till 1970's hunting was done from traditional bow and arrow which has been shown in plate

V.1. Hunting materials used by hunters are dug with the dead corpse which becomes difficult to encounter the traditional materials. However, bow and arrows can be found in house where elderly hunters are still alive. Hunting with bow and arrow is not easy only a skilled archer can be a good hunter. The hunters had to face a lot of challenges in hunting with bow and arrow. Hunting with bow is done with a much closer range than hunting by gun. Patience is the key in hunting, more so with the hunting using bow and arrow. Risk is also high because the hunters has to shoot the animal from closer range. Hunters have to know the specific areas frequented by animals and need to wait for the animals to come closer. It limited the numbers of animals they could hunt; hence they started using traps.

Plate: V.1

Traditional Hunting equipment's



Source: Field survey, August, 2019

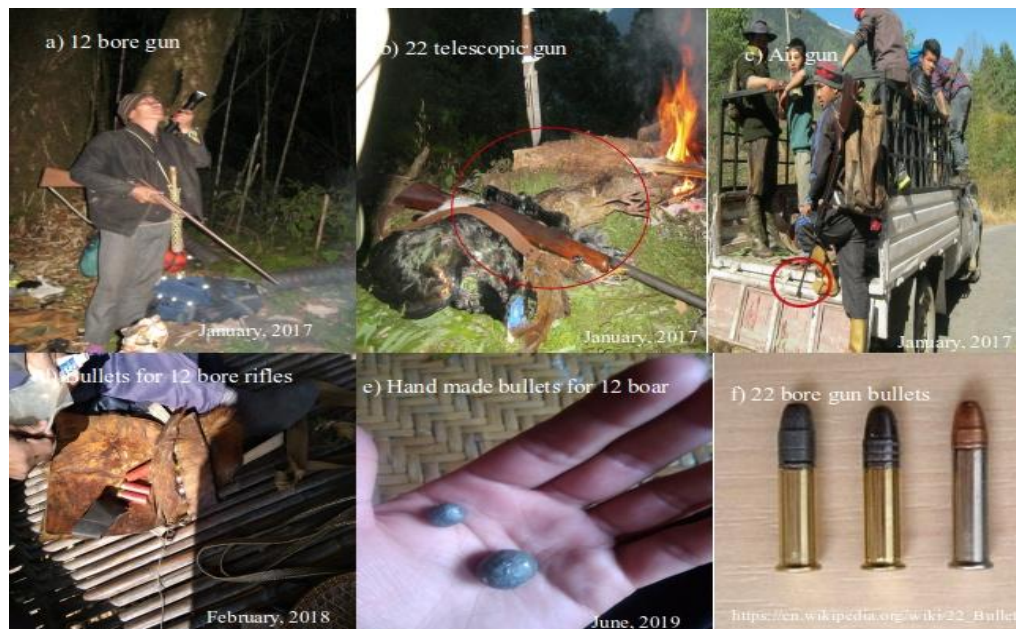
At present guns are used by hunters. 12 and 22 bore guns are commonly used by them. It becomes easier to hunt animals with guns. These days' hunters have started using telescopic guns.

Hunters cannot afford bullets all the time. Therefore, they make their own bullets which is shown in (plate V.2.e). To kill the larger animals, size of the bullets is bigger as well. Whereas hunters use the smaller bullets to kill the smaller animals. The price of the bullets for 22 bore guns is quite cheaper. There are many people who cannot afford guns or when

their guns are not functioning condition, they borrow others. Hunters have to give equal half of meat of the animal hunted to the owner of the borrowed gun. Thus, owner of guns often gets meat from the wild without hunting.

Plate: V.2

Types of guns and bullets used in hunting



Source: Field survey

As mentioned in previous chapter there is always a pride in hunting. The skull and horns which are decorated in house will be taken by hunter. Only the meat is distributed. Hunting is also done using booby traps. There are more than forty types of traps used for hunting. Stones, bamboo and woods are used in making traps. Usage of traps can be considered as passive hunting where hunters set up their traps and wait preys to find it rather than they finding the animals and going for the kill.

Trapping of animals is done by both male and female. Females usually trap smaller rodents while males traps mammals and birds. A type of trap is made especially for larger animals. A rectangular pit of 5 to 8 meters is dug where sharpen wooden logs are concealed. The hole is kept camouflage; when animals falls into it sharpened logs and sticks pierce through them. The hole is covered in such a way that the surface breaks only when animal weighing more than 8-10 kgs steps over it.



Source: Field survey

The active hunting of animal has increased with the usage of gun. Himalayan Musk Deer *Aala* are hunted much more by the active hunters than traps. For hunting the Musk deer, the trap was the only material used. Hunters used to set-up the trap and wait for several days until the animals get trapped. Hunting Musk Deer with bow and arrow has been nearly impossible. Present it is trapped as well as gunned down both. Even though the agile *Aala* can be targeted easily with telescopic guns, it camouflages quite well hence, hunters rely much on traps.

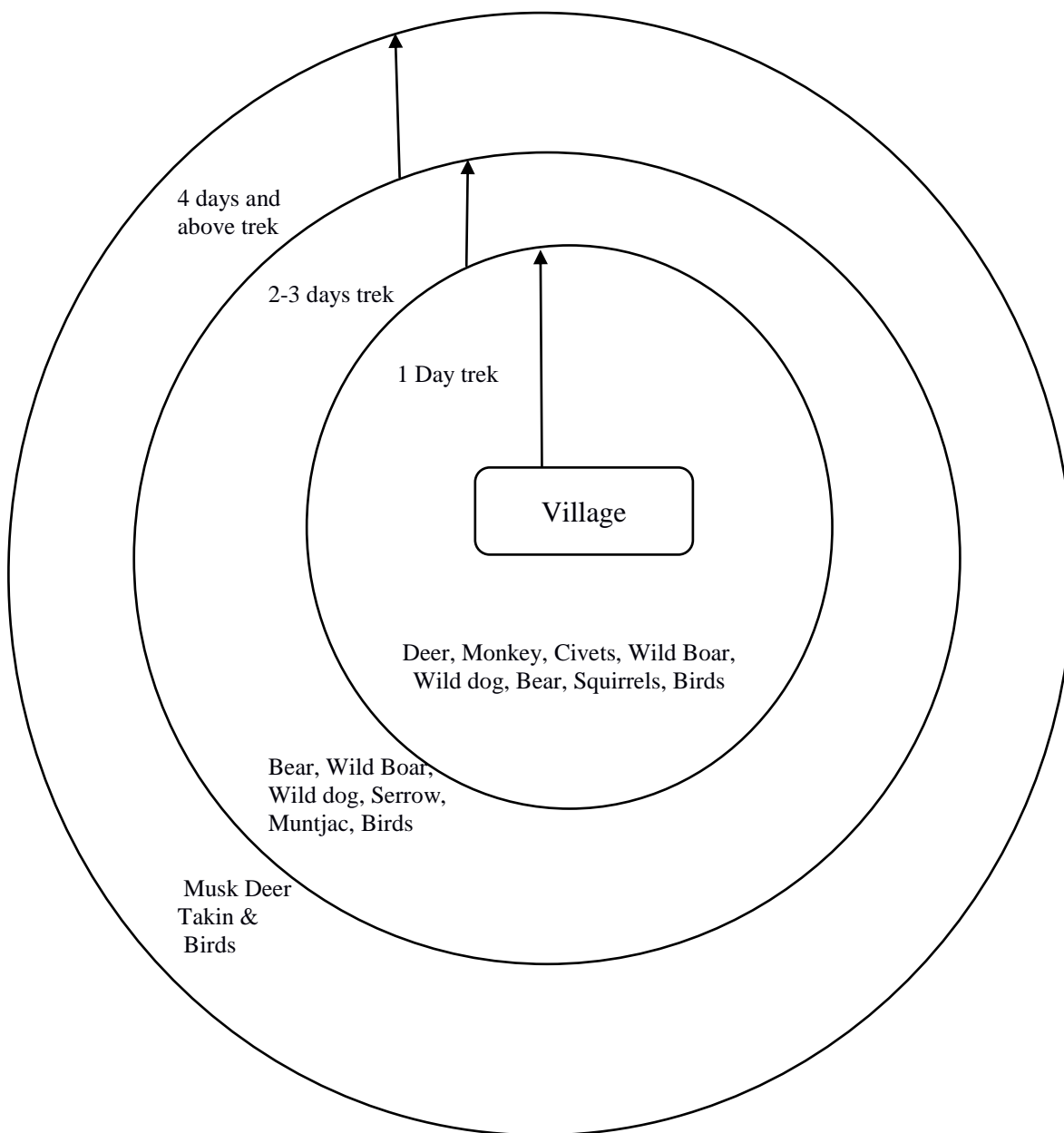
After introduction of modern equipment's like guns and LED head lamps and torch lights, hunters started night safari as well. Animals like civets, bear, deer, squirrel are killed that was killed relatively more frequently which rarely used to happen earlier.

V.2. Specific areas and hunting

A linear pattern of settlement along river exists in Dibang Valley. Villages are scattered and settlement are located below 2000 metres. Villages is physically attached to jungle, which results in the interface between human and animals. Wild animals can often be sighted right outside villages. Animal share a niche according to the elevation. Variety of birds and squirrels are frequently seen in the surrounding areas of settlements. Animals like monkey, bear, deer, raids the crops. Animals like wild cat and civets comes and steal chickens which

are kept underneath the house. Animals which are found near the human habitat areas are often encountered. Animals like Takin, Himalayan Musk Deer, Serrow, Red Muntjac, Goral are found at higher elevations and hence, their sightings are less frequent.

Figure: V.1. **Distance of the animal sighting from the Village**



Note: Rough sketch showing the possibility of animal sighting in according to walking distance from village. Village has been placed in center and the circle divides area into three different zones.

Figure V.1. depicts a rough sketch showing the distance of the animal sightings from the village. The circular chart shows distance of animal sighting from the village. The village has been placed at the centre and circle divides zones in terms of distance. The area has been divided into three different zones which shows presence of animal and the possibility of

sighting it within walking distance from a village.

The zone 1 depicts sighting of deer, monkey, civets, wild boar, wild dog, bear, squirrels, varieties of birds within a day's walk.

The zone 2 shows sighting of animals like bear, wild boar, wild dog, serrow, muntjac, varieties of birds is possible at a walking distance of two to three days.

In the zone 3, the diagram reflects that to hunt mammals they have to climb at least 3-4 days. Presence of Himalayan Musk Deer is there at high-altitude areas. Varieties of birds and rodents too are found in this zone. In general, such trips are made for longer duration.

Animal often changes its habitat with respect to season. In winter due to the snow-covered mountains, animals are forced to come down. Hunters usually have to walk for 4-5 days during the hunting season; in winters such animals can be sighted within a day's walk.

However, animals are still not easily sighted. These animals hide in thick vegetation zone where area often becomes inaccessible for humans. Sighting of animal becomes possible when they come in salt lick areas and in springs. The encounter rate is very low in winter. There are many animals like takin which stay in a herds. The same animal becomes solitary owing to shortage of food.

Plate V.4:

Burning of bushes, Etabe village



Source: Field survey, February, 2018

During winter due to which hunters rely on trapping of birds and rats. Bigger animals are also hunted but the chance of their sighting is quite decreased in time of the year. Hunters have to wait for the animals in the waterhole and areas where they come in the salt lick areas.

During winter the mountain vegetation turn brown and the bushes nearby a village are burned. Ungulates are attracted to eat those grass. The grasses are consumed by the mithun and other animals, particularly ungulates. During winter hunter hunts such animals when the animals comes to eat the grasses.

Through the field observation and narratives of locals from various locations reveal that with the changing time, demand of the people got changed. People collecting the herb *Paris polyphylla* are increasing. Non-locals are brought from the other districts of Arunachal Pradesh. It has impacted animals adversely. Huge number of people enter into the forest from April to July. For a long, people camp inside jungle and searching herbal plant. Such activity disturb animals in their niche and has led to increased killing of wild animal.

Mr. Tocha Mipi founds that, “the human-carnivore conflict got increased in the area.” Much of it are resulted because of the increasing human activity inside the forest. The animals like wild dog *Aprupu* are coming into the lower elevations and attacking the Mithun. People are very much concerned about their mithun getting killed by the wild dog. Earlier it used to happen only in winter. Presently, because of the increasing human activity the wild animals are facing difficulties in their own natural territories and started migrating in the lower elevation areas.

V.3. Routes for Hunting

Tracking routes in the broad understanding is to comprehend the systems and patterns of animal hunting, animal life and the ecology. Hunting has traditionally been done by different section of people with various purposes. Jungle starts few metre from villages. Children roam around nearby areas carrying catapult in hand targeting birds. People go to

nearby areas to collect fodder for pigs and other domesticated animals. Collection of fodder is done usually women. Male join females when the load is too high or when the distance is far. During summer fodder is available closer to villages but during winter they have to venture inside forest. Often such visits are doubled up with hunting. While females traps field mice their male counter parts accompany them to the forest with catapult and gun. Thus, they hunt birds and squirrels. Other animals during such trips are rarely hunted. They often use the same track which are used for the long hunting trip.

This section emphasizes on routes used by active hunters in their hunting trips. Map IV.1. shows three major routes people used to follow to go to Tibet. People followed same trails which their great-grandparents used to walk upon. They follow the same routes for hunting that leads them to the border and beyond.

Hunting zone differ with respect to animals. Some animals are hunted primarily for meat, while some for their skin a few of them for income. Active hunter' generally goes to hunt with the motive to earn some amount of cash by hunting valuable species. Aala is quite prominent in this regard. *Aalais* found above 3500melevation.

The distance of hunting depends on season and the targeted animals In Idu-Mishmi community village level hunting zones are demarcated. However, hunting of smaller animal like rodents *Kachingo* are usually done on individual land. No villagers hunt rodents in someone else land.

Table: V.1 **Prominent animal sighting and the frequency of hunting**

Animal Sighting	Frequency of sighting (increased/decreased/unchanged)	How often they are hunted (rarely/ often/ occasionally/ seasonally/not hunted)
Tiger	Unchanged	Not hunted
Leopard	Increased	Not hunted
Black Bear	Increased	Rarely
Wild Dog	Increased	Often
Civets	Unchanged	Often
Red Panda	Increased	Rarely
Himalayan Musk Deer	Decreased	Seasonally

Mishmi Takin	Unchanged	Seasonally
Red Muntjac	Unchanged	Seasonally
Himalayan Serrow	Unchanged	Seasonally
Wild Pig	Increased	Often
Red Goral	Unchanged	Seasonally
Arunachal Macaque	Increased	Rarely
Squirrels	Unchanged	Often
Mouse	Increased	Seasonally
Tragopan	Unchanged	Seasonally
Monal	Decreased	Often
Blood Pheasant	Decreased	Often

Source: Field Interviews, 2019

Table V.1. Shows the prominent animals and birds which are sighted by the hunters. The sighting of tigers is not much however, the movement of the tigers are recorded through its sign. The activity of tigers in the human dominated landscape has been increased as compared to past. The killing of mithun has increased. Leopard are often sighted by the hunters. Tigers, leopard and other large cats are never hunted by the Idu-Mishmi. In a rare case large cats get killed through the passive hunting.

Activities of bear and wild dog have increased. They often raid the crops and attack domestic animals..Still bears are rarely hunted because it is considered difficult to hunt. It is hunted only occasionally when it enters into the people's agricultural land.

Predators of dogs are very less: every year 4-6 pups of dogs are born which is increasing in the increasing the population of these dogs. Earlier wild dogs were very rarely hunted but now these free-ranging dogs stay in a pack and attack even big animals like mithuns. This has led because to the locals to hunt the dog down for reduction in the damage done by these dogs.

Civets are found in the nearbyvillages therefore, it is often hunted. Other animals like musk deer, takin, muntjac, serrow, goral are found in higher elevation.Hence, these are hunted seasonally. Sightings of the Musk deer have decreased because it is hunted frequently for commercial purpose. Other ungulates are hunted seasonally and mostly for meat;

therefore, their population has been stable. In winter these animals are found in the lower elevation areas but because of the higher slope and dense vegetation zone the encounter rate becomes very less. Due to which the hunting of birds, mouse and squirrels are done in the winter. Monal and pheasants are the bird which are available in both the seasons and are often hunted.

The routes for hunting have been renovated by the newer players in Dibang. Since the deployment of military in Dibang after 1960's. They have been patrolling till the border to Tibet. The routes for hunting have been renovated and stretched out according to make the route easier. In some places the bridges and monkey rope are built because it has become the regular track for the military people. During patrolling the hunting happens. "We hunt one taken when we hit the pass. It is completely hunted for survival purpose and no one should question us for that." Army personnel, Dibang Valley. This patrolling is wholly dependent on locals and the same routes and rest points are used by the military while patrolling. Only the difference is, here the rest point for the officers are fixed which is not in the case of hunters.

The inclusion of hunters can be seen in Dibang in the form of plant hunters. They not only search the herbs for which they are sent in the jungle. A part of it they hunt the animals. They scan all the areas in search of the plants and animals. Non-locals are also brought to hunt the Musk Deer. They not only hunt the musk but also hunt the other animals which the Idu never hunted. They hunt the Tiger and other valuable animals in the jungle. They follow the traditional routes used by the locals. However, they try to move in every possible route in search of the targeted animals.

V.4. Changing dynamics of hunting

The Idu-Mishmi society has gone through a number of changes. The demand for resources got replaced with the time. Materials used for hunting and structure of hunters has changed too. Earlier people used to visit jungle on regular basis. They never used to miss seasonal

hunting trips until and unless the taboos restricted them. Their economy was based on plant and animal hunting.

Change in socio-economic activities affected the change in the pattern and structure of hunting. Agriculture was only for self-consumption. Presently, horticultural crops like apple, kiwi, oranges have been introduced recently. Due to the lack of market facilities people are not able to sell their oranges. Kiwi being valued fruit are procured by the middleman for relatively quiet cheap at (Rs.50-70 per kg). Lower returns from agriculture and dependence on middle men rendered agriculture less serviceable for the people. Thus, the locals have to hunt animals and collect plants from the jungle to supplement their household economy. ChachaMiu explains the change he witnessed in the society and in hunting.

Experiencing the change unfold

I see change in three phases. My grandfather used to spend much of his time in jungle hunting bird and animals. Meat used to be their vegetables. My grandmother used to wake up at the dawn and would go the agricultural field. I do not remember any single day she stayed in the house during the day time. We used to cultivate maize and millets. They used to wear clothes made up of sheep and monkey skin. We used to wrap our self with the blanket made from the tree bark. I have used such blanket till I was young.

My father's days the condition was somewhat similar. He neither had good clothes nor shoes. We somehow went to the school and studied. I had to walk 7 km one way to school. Teachers used to speak Hindi which was difficult to understand. In school rice was served.

I used to wonder what a soft thing we got to eat. It goes so easily in the stomach. I remember my grandmother serving us meal and when we didn't eat that she used to say you donkeys eat your food. This food has fallen from the sky, making the reference to rice.

Many years later I started staying in Anini. When I first wore shoes, I felt so uncomfortable that much of the time my shoes used to be in my basket. And would walk barefoot. I came to Anini in 2000. My feet has become so soft that I can't walk barefoot

now. Earlier my feet were so thick it could easily resist plants thorns. I tell my wife we led such a life and my son has been so pampered and spoilt That kid has been wearing suit and boot right after birth.

In our young days we guarded agriculture field from deer and monkey during day from bear at night. Today everything has changed. Young generation are acquiring education. Among them most of them are first generation learner.

Chacha Miu, Maronli village

Chacha Miu’s narrative summarises overall change in the society. Which include change in the hunting, the dependency on hunting as well as change in consumption pattern of the society. These three important aspects were tried to understand into more detail through an interview with the local people.

Table: V.2. **Change witnessed by the society**

Questions	Total no. ofrespondent	Yes	NO	Source	Targeted group
Change in animal sighting	27	89%	11%	Semi-structured interviews	Hunters
Dependency on Hunting	60	67%	33%	Semi-structured interviews	Male/Female
Change in the consumption pattern	60	87%	13%	Semi-structured interviews	Male/Female

Source: Field survey, 2019

The above table shows changes which has been witnessed by the society. This question pertaining to change were asked to the 27 active hunters.Among them 89% has experienced change in the sighting pattern of animal. Everyone mentioned that the animal presence in the specific areas have remained the same. However, the sighting of animals has not remained similar. Many old hunters narrated that earlier it was very easier to hunt the *Aala* Musk Deer. At present, hunters are struggling to encounter the *Aala*. On the other hand, animals like bear, wild dog are entering in to the human dominated landscape more frequently .

Among the 60 interviews 67% of the households are dependent on plants collection and animal hunting. They hunt and sell the valuable products in market. remaining 33% of them

are not using the forest and its products for income even though they use to consume plants and animal. After the development of connectivity in the area local people particularly from Anini and Etalin have started dependent on the grocery shops. Rice and dal have become staple diet now. Vegetables are also brought to the local bazar from Lower Dibang Valley and Tinsukia in Assam. However, road connectivity is still poor and faces frequent road blockade. During such period even the people of Anini starts going to villages and jungle in search of locally available wild edible plants. Thus, people in Dibang are directly or indirectly dependent on the forest.

There has been change in the consumption pattern of the society. Earlier maize, millets, wild plants and animals were staple food. They used to prepare food simply by boiling. Among the 60 households, 87% of it have agreed that their household gastronomy have registered some change. They have started eating from grocery stores and a few have started eating deep frying their food often now. However, few villages which exist in the remote areas are not influenced by the modernity and its way of consumption.

Structure of hunters has been changed. Earlier hunters used to go alone on long hunting trips. They used to roam alone towards the border in search of *Aala*. Now they often go in a group of 2 to 4 members.

The people from outside have started coming to Dibang Valley in search of *Letesi*. These people stay in the jungle for longer duration in every season. Their group often consist of more than five people. They stay in the jungle until their baskets are filled with *Letesi*. They use the same track which are used by the locals and scan almost every corner in search of the herb. They hunt all the available creatures in the jungle including the Himalayan Musk Deer. Local NGOs and the local government in collaboration with the locals have banned the outsiders who go to the jungle. But such trips have not completely stopped.

Being the border area, Dibang Valley have considerable presence of armed forces as well. Along all the remote routes they have set up their camps. There are camps in the jungle

which can be accessed only after walking for four to five days. In such remote areas the soldiers often rely upon jungle resources as well. They often go for their Long-Range Patrolling (LRP) and Short-Range Patrolling (SRP) with relatively big team of soldiers and porters.

The flow of tourist has increased as compared to past. Due to deplorable condition of road and problem of accommodation tourism is not very developed in the valley. Irrespective of such condition tourist still visit Dibang. Locals take them to the jungle on trekking trips. Tourist often tries to join hunting parties and consume wild meat. Some educated Idu-Mishmi people have become concerned about such things when they take the outsiders to the jungle. However, there are still plenty of indifferent tourists and some locals as well.

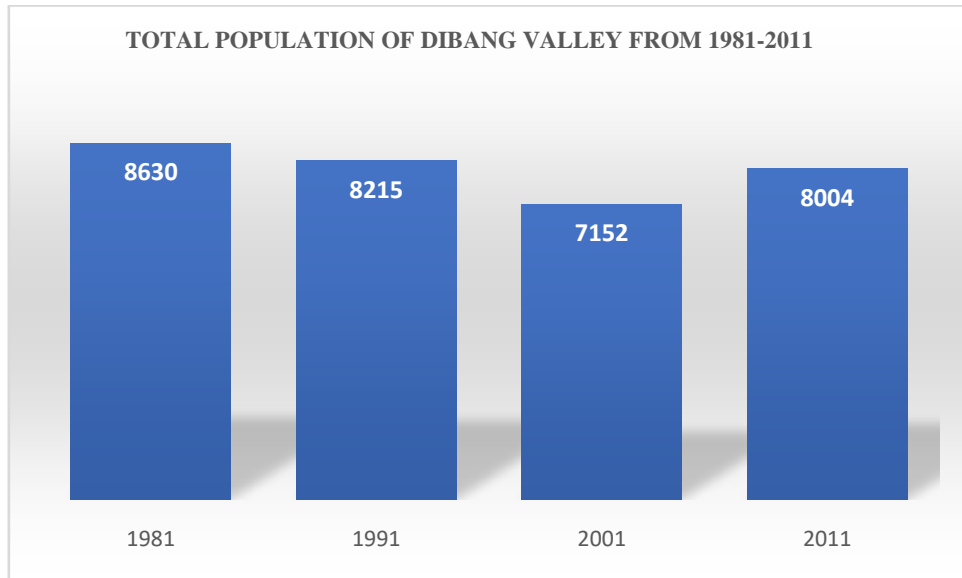
As discussed in the overview of literature in chapter one there is contradiction in idea regarding conservation. One section of conservationist believe that hunting is ecologically unsustainable. It is beleived to be the prime factor for negatively affecting wildlife population. However, the other school of thought supports 'regulated hunting'. They believe that regulated hunting plays a key role in wildlife conservation. However, in Dibang Valley conservationist are against continuation of the traditional hunting system. They strongly believe in the creation of a Tiger Reserve that will help the wildlife conservation.

It is often considered that humans are the biggest problem in wildlife conservation. The increasing populations lead to degradation of jungle. Similar opinion was highlighted by the conservationist when they were asked about the conservation in Dibang Valley. They pointed out that we need to change according to time. The people should have restrictions going to jungle.

The figure v.2 highlights decline of the population growth in the area. The population of the Dibang Valley after 1981 has decreased from 8630 to 8215 number of people in 1991. It declined into 7152 in 2001. However, in the last census 2011 the population has shown a slight growth and now the population of the area is 8004. It clearly shows that the

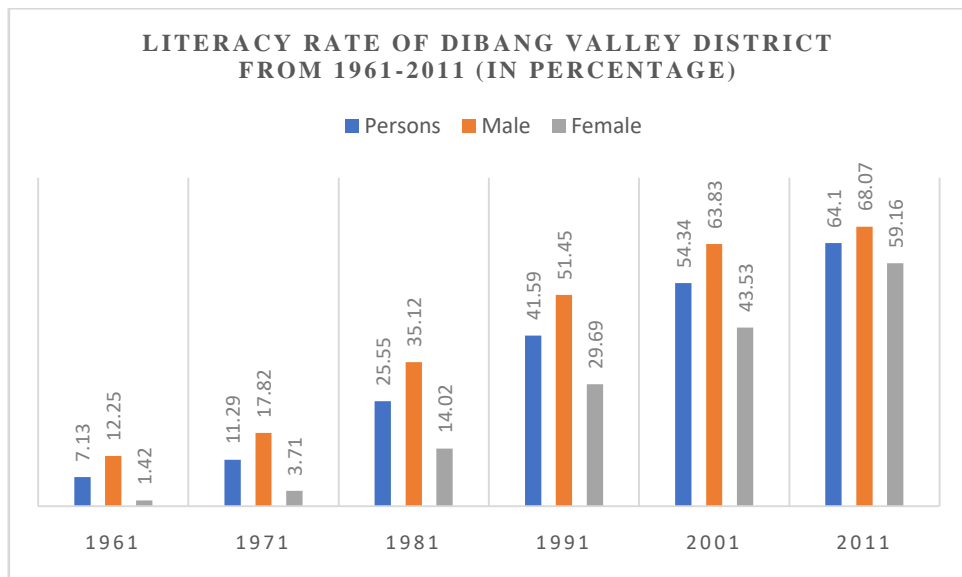
consumers of the wild meat have not increased. Moreover, there are 44.85% of female population in Dibang. Traditionally, female usually do not eat wild meat. Therefore, almost half of the population in area are forbidden consuming wild meat.

Figure: V.2



Source: District Statistical Handbook (2016). Government of Arunachal Pradesh

Figure: V.3



Source: District Statistical Handbook (2016). Government of Arunachal Pradesh

Literacy rate has increased from 7.13 percent in 1961 to 64.1 percent in 2011. It brought a change in the socio-economic activity which resulted in decline among the active hunters. The education is helping them to come outside the districts and imbibe some ideas from

others as well. The transport and communication systems, market towns, administrative centres, social media are changing the people. A lot of people are engaged in secondary and tertiary sector of economic activity.

There took a change in typical jhuming family and they have started cultivating commercial crops. Some changes are visible even in the way festivals are celebrated. The overall changes have brought change in hunting among the Idu-Mishmi too.

People used to go to villages in Tibet for barter trade. There have been three major routes to Tibet. Till today the same route are followed although the movement is not that frequent any more. Taboos and believe systems are playing strong role in everyday living of the society. Traditional faith healers are playing an active role in stabilizing hunting and rituals pertaining to it intact by preaching the do's and don'ts of it. But like everywhere else, things are changing on fast pace even in the valley of late, how long will they last and continue to live a way of life which has been lasting for century is question now.

Dibang valley should not be imagined as a district with a few thousand population inhabiting in an area. A uniform law and idea of conservation may not be able to conserve the ecosystem of the area. It is a large area of 9129 sq./km where Idu-Mishmi have been able to conserve the nature and wildlife with the traditional way of living. It would not be a bad idea to accommodate Idu_mishmi's way of looking at their ecology and accordingly conserving it.

Chapter VI

SUMMARY AND CONCLUSION

Till a recent past, Dibang Valley remained rather secluded. The area was largely attracted the British because the region served connectivity to Tibet. Traditionally, hunting used to be the mainstay of the food basket of the people which in due course of time it became supplementary factor of the food requirement for most of the people in the valley.

There took place a trade relation with Tibet in one direction and Sadiya on the other side. At present no more barter exists. However, hunting plays a key role for the survival of the locals. There are prominent animals that are targeted by hunters. Hunting is influenced by physical condition and cultural values.

Animals have been central in the Idu-Mishmi livelihood and economy. Meat has been essential in every occasion. However, wild meat is not allowed during cultural festivals or in any kinds of rituals. Semi-wild mithun are highly valued and are required on every occasion. Taboo and believe systems govern hunting. They try not to exploit the resources beyond what is needed. Idu Mishmi have not been killing the wild animals and collecting plants indiscriminately. Tiger hunting has been a taboo. Tigers and the other large cats are protected in the land of Idu-Mishmi. A part of tiger there are several other animals which has taboo and has restrictions in hunting. On the other hand, hunters take a pride in hunting takin and other animals.

Issue pertaining to wildlife sanctuary and tiger reserve has created insecurity among the locals about loosing their rights to accessing forest. The idea of conservation often contradicts with the government policy. While it allows construction the huge dams and Hydel Power Projects which will directly impact negatively the environment and wildlife, on the other hand it tends to limit community rights through conservation initiative. In doing so, community sensibilities are often ignored. The Idu-Mishmi culture has set an example of 'co-existence' with the nature. In reality, the culture has scientific rooting for

conservation. External influence has pronounced footprint which are negatively impacting the indigenous culture.

Earlier discussions are summarised as follows: -

I.1. Dibang Valley is rather secluded from the urban centres. The remote locations and strong cultural linkages have bound the Idu Mishmi people to be largely dependent on the locally available resources.

I.2. Hunting of plants and animals are done to meet their requirements for livelihood. Animals are hunted, meat is highly valued and hunters take pride in hunting. However, there are many animals and plants which are never hunted by Idu Mishmi. Those animals are considered devine among the locals. Cultural institutions govern hunting activity among the Idu Mishmi community.

I.3. The study tries to understand the actors/actants which are playing active role in bringing change in the area. It was found that hunting and wildlife are influenced by physical, social, cultural, economic and non-local actors.

I.4. Traditional institution is geared in conserving the wildlife, the preservation of wildlife and overall changes in the valley have thrown the newer dimension in the area. The study tries to understand the complex relationship between Human and Animal.

I.5. The area of study is Dibang Valley. It is a least populated district in India inhabited by Idu-Mishmi Community.

I.6. Objectives of the study is to understand the significance of hunting trails in the valley and to access the changing pattern in hunting practices.

I.7. Research question of the study is to understand the role of hunting and how it has shaped social instutions.

I.8. The study adopts a mixed methodological framework. Participatory Rural Appraisal (PRA technique) along with Actor Network Theory is used as a methodological framework.

I.9. The data obtained through interviews, direct observation method and the photographs

are analysed qualitatively. The sample has been depicted through table, charts, figure and discussion.

I.10. Connectivity, social taboos, and scarcity of time became the major constraints in this study.

I.11. There are six chapters divided into different sub-themes.

II.1. Hunting is influenced by the biophysical environment. Habitat selection by animals and migration is guided by the altitudes. The slopes and aspect has influenced the human settlement and also animal habitats.

II.2. Seasonal factors play a prominent role in hunting. During summer hunter goes to higher altitudinal areas in search of Himalayan Musk Deer, Takin and other high altitudinal species. In winter, movement of humans and animals get restricted due to the extreme climatic factors.

II.3. Dri, Mathu, Tangon and Emra are the major rivers of the Dibang Valley. Human settlements in the valley are along these rivers. Hunters use to wait for animals in the water holes.

II.4. Vegetation type is closely related to the presence and abundance of species. Majority of hunting sites are located in dense vegetation zone.

II.5. Idu-Mishmi society has been mainly dependent on hunting; however, communication system brought changes in hunting. As compared to remote villages, hunting activity is less in villages which are along major roads. At present, dependency level on hunting economy is minimize.

III.1. There are as many as 156 mammal species and more than 137 bird species along with the varieties of reptiles and amphibians. Hunting has been guided by the physical and cultural factors.

III.2. Valuable plants and valuable parts of animals were bartered with Tibetans in one direction and at Sadiya in Assam in another. With due course of time people got engaged in

the secondary and tertiary sector of economic activity as well which made hunting a supplementary factor in livelihood for many.

Villages in Dibang lacks in basic amenities. Hunting is still rather essential for sustenance for many. In the Idu Mishmi community females have to follow much of the food taboos as compared to males. They are not allowed to eat meat of wild animals. The taboo equally restricts them to eat the domesticated animals. Fish and wild rat and mouse are consumed by Idu Mishmi women. Therefore, collection of plants and animals become basic supplementary factor of in nutrients intake.

III.3. There are prominent animals which are hunted by different section of the community. Small birds are hunted usually by boys using catapult. Rats and mice are trapped by women's and male both. Large mammals like Musk Deer, Takin, Muntjac, Serrow, Wild Pig, Bear and birds like Monal, Tragopan etc are hunted by male. In the Idu-Mishmi culture large cats are not hunted. On the other hand, the prey diversity is much higher with compared to the predators. Therefore, hunters play a crucial role by balancing the animal diversity.

III.4. Hunting trips can be divided into three types on the basis of season, very short, short and the longer trip. During winter (December, January, February and March) booby traps are generally used for rat, mouse, birds and also for mammals. Hunting season of mammals is in summer (April, May, June, July and August) when hunters use to climb higher elevation areas to hunt the animals like Musk Deer, Serrow, bear etc. Size of hunting groups depends upon situation and plans. Generally, size of a group consists of 2 to 4 persons.

III.5. Humans should not be separated from the nature. Conservation should be guided with the idea of co-existence.

IV.1. Religion and believe systems are guiding the hunters. Cultural institutions, allowed and forbid hunting of animals be hunted. The animals which are not hunted has been placed in a higher position in the Idu-Mishmi culture. During the birth and death rituals, marriage,

festivals or in any occasions non-domesticated animals are not allowed to set in the menu. Such taboos directly and indirectly regulate hunting.

IV.2. At present no Idu Mishmi goes to Tibet nor do they have the trade relationships. However, Tibetans enter in Dibang Valley for hunting. Besides, pilgrims from Tibet use to come in Dibang Valley to worship the mountains and Valleys.

IV.3. Animals have been important to the locals beyond their livelihood and economic systems. Hunting even helped to acquire a status for individuals in the society. Among animals Mithun has been placed at higher pedestal. Wild animals are found to be the 'feared' animals. It is believed that if someone violates taboos then their spiritual God *Golo* will invite his wrath upon the hunter and his family.

IV.4. Tigers are never to be hunted. If by mistake, it gets killed by falling into traps set-up by the hunters will have to follow dead rite for of the tiger which is similar to the ritual performed in a funeral for human. Entire village has to follow the taboo. Tigers and the large cats are protected in the area due to the cultural taboo. On the other hand, hunters take a pride in hunting Takin because it is among the toughest animal to hunt. In summer, it stays in the alpine area and in winter due to the snow-covered mountain it comes into lower elevation areas. June, July, August and September are the hunting season of Mishmi Takins. The population of takin will still remain stable if 'traditional' hunting is continued. The traditional culture is helping the balance in the ecosystem by controlling the predators and prey population.

IV.5. Government policies, developmental project and establishment of a wildlife sanctuary appear to picthe the traditional ways of conservation. The community can be credited for the protecting tigers following their cultural norms and taboos with a sense of insecurity they question the government reason for creation of a Tiger Reserve when the species has already been protected in their culture.

V.1. Administrative set up, deployment of military, establishment of schools etc increased

movement of people to the valley. Thus, started to appear in the valley. Hunters who used traditional equipment's for hunting, started using guns. It became quite easier to hunt animals through guns even from a distance. The encounter killing of the animal got increased with the use of gun. After the introduction of modern equipment's hunters started covering a short distance of 3-4 kilometres by doing night safari.

V.2. Animals shares a niche according to the elevation. Varieties of birds and squirrels are seen in surrounding villages. Animals like bear, deer, monkey, civets, wild pig can be sighted at a distance of one day walking. Serrow, wild boar, wild dog, muntjac etc are seen in about two days of walking distance. Takin, musk deer, goral are found at walking distance of about 3 to 4 days from villages. Due to winter snow, animals are forced to come down but owing to thick vegetation and steep slopes, possibility of sighting them are still low. Therefore, fewer large mammals are hunted in winter.

V.3. Hunters use to hunt by roaming in all the possible directions in the jungle. There are three major routes which connects the valley to Tibet. Hunters follow the same track for the long hunting trips. In winter hunting distance becomes shorter. The inclusion of the non-local hunters led to stretching the hunting routes in the area.

V.4. The Idu-Mishmi society has gone through a number of changes. The demand for resources has changed with time. It has affected the pattern and structure of hunting. Due to introduction of horticulture and other economic activities, dependency on hunting has decreased. Thus number of hunters has also declined. However, hunting still continues to supplement the livelihood of the locals. Wildlife has traditionally been thriving in the area. The population of the area has remained stable since long period of time. The literacy rate has increased. Traditionally, Idu-Mishmi value kept a balance in the ecosystem.

Hunting holds a key position in the complex relationship between the Idu-Mishmi and the natural environment. Addressing both the physical and cultural factors of hunting shows that Idu-Mishmi incorporates spiritual and cultural landscape elements in their hunting practices.

This study relied on participatory observation methods.

These findings confirm those of authors who have analysed the developmental projects in the area which is under construction. Creation of mega hydropower project will affect the area in multifold ways. People's economic status will be improved, the job opportunity will be increased, and it will be easier for the locals to access the areas through the development of the roadways. On the other hand, a 288-metre-behemoth, 26.7-mile-long reservoir will set an ample of negative impact. Neglecting the social impact factor, the hydropower project is under construction which will result in submergence of a huge area of 5000 ha. It will affect community and traditional livelihood system. Social and occupational change will disbalance among the locals to cope with the newer trends of labour demand which will result in unemployment in the area. Roads in the valley are still under construction. It is expected to bring in some non-local hunters in the area as well. Distance and mode of travel that a hunter will travel from his destination is significant for hunting. Therefore, the development of highways may lead to not only increase in hunting activity but also add up to the area.

Concerning the Dibang Valley, academic criticism against hunting has been observed however, it is crucial to understand the traditional institution's synergy with nature and the community as the part of the valley's ecology and not independent of it. Government wants to create a Tiger reserve in Dibang Valley because hunting is believed to be ecologically unsustainable. Whereas, long reservoir got the environment clearance in the name of 'run-of-the-river plant' is under construction. This is rightly pointed out by some of the community members as contradictions in government's approach with respect to construction of a Wildlife Sanctuary and Tiger Reserve which are created to control human activity in the jungle while mega dam got environment clearance. Traditional governance system and the everyday living of the Idu-Mishmi community have been undervalued, which is geared towards conservation of nature. Moreover, conservation can not be properly possible by

demarcating 'fragmented'/enclosed territories the free ranging animals.

Understanding the Idu-Mishmi culture and the issues of conservation it could reveal the social, biological and environmental drivers of hunting that must be considered in Dibang Valley. Non-locals involve in hunting must be restricted. Policy makers must understand the finer fabrics of Idu-Mishmi way of hunting and the cultural ecosystem as a whole. In addition, policy must target to and make the cultural institutions much stronger.

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Glossary of Local Terms

Apiya: Elder brother

Alia: Younger brother

Athi: Sister

Angoge: Friend

Amruhu: Fire

Ambo: Maize

Ata: Food

Ayo: Rain

Asimbro: Tree

Are: Plant

Aanapa: Vegetable

Amroni: Hunter

Aamama: Black Panther

Ama: Tiger

Aala: Himalayan Musk Deer

Aakru: Mishmi Takin

Aammee: Wild Pig

Aamee: Red Goral

Aame: Arunachal Macaque

Aahun: Black Bear

Aprupu: Wild Dog

Aapoee: Civet

Aiminjini: Red Panda

Ataye: is the rituals performed for the well-being of new born baby

Arebu: is the funeral ritual performed when a person dies through unnatural death

Aiye: is the funeral rituals performed in a normal death

Atonsa and *Yakula*: is the rituals performed for the protection of family from evil spirits

Aseleko: Idu-Mishmi during funeral rituals send the soul of a dead person to the place of their origin (China). This ritual is called Aseleko.

Apoo: Slave

Aaya: Funeral

Aamala: is the tigers teeth *Igu* carry during the rituals

Atoh: Chicken

Chenda: Himalayan Monal

Chicko: Blood Pheasant

Ela: Moon

Elii: Pig

Ewullu: helps the *Igu* performing the ritual. *Ewullu* are the crying person who plays a prominent role in the dead rituals. Idu believe that when a person dies they carry a lots of pain and miseries. *Ewullu* helps them to overcome with the sorrows. While sending the soul to the destiny, *Ewullu* take care about the food, drinks and the essential things. It is their responsibility to take care of the corpse.

Golo: Spiritual God of the jungle

Gyeana: Taboo

Inyi: Sun

Ilipa: Bow

Igu: Priest

Iputa: Bullet

JungleePata: includes, Pig weed, Chinese Leek and other green leaves which are available locally are generally used by the Idu-Mishmi.

Kamba: Jungle
Kachingo: Field Mouse
Letesi/ katchu: 'Paris polyphylla'
Misu: Evil Spirit
Maselogini: Creator of the Universe
MishmiTeetha: Coptisteetha
Mayata: Arrow
Mithun: Gayal
Maanjo: Red Muntjac
Maren: Serrow
Meya: Boy
Machi: Water
MupiMra: Slash and burn agriculture
NaniIntaya: The Sun God
Nani: Mother
Naba: Father
Nata: Grandfather
Naya: Grandmother
Nabaliya: Uncle
Naniliya: Aunt
Oko: House
Peba: Satyr Tragopan
Pidi: Sclater Monal
Prasana: Parrotbill
Puku: Laughing Thrush
Paku: Agriculture

Rajpankhi: Flying Squirrel

Sibra: Fruits

Tambre: Meat

Tambreoo: Hunting

Tamama: is the rituals performed by the *Igu* on Tigers death

Yaku: Girl

Yuu: Traditional Rice Beer

APPENDIX-I

List of Mammals

Sl. No	Common Name	Scientific Name
1	Black Panther	<i>Panthera pardus</i>
2	Tiger	<i>Panthera tigris</i>
3	Clouded Leopard	<i>Neofelis leopard</i>
4	Common Leopard	<i>Panthera pardus</i>
5	Leopard Cat	<i>Felis bengalensis</i>
6	Jungle Cat	<i>Felis chaus</i>
7	Asiatic golden cat	<i>Catopuma temminckii</i>
8	Wild dog	<i>Cuon alpinus</i>
9	Jackal	<i>Canis alpinus</i>
10	Red Panda	<i>Allurus fulgeris</i>
11	Spotted Lingsang	<i>Prionodon pardicolor</i>
12	Wild Boar	<i>Sus scrofa</i>
13	Common Mongoose	<i>Harpester Edwards</i>
14	Yellow bellied weasel	<i>Mustela kathiah</i>
15	Slow Loris	<i>Nycticebus coucang</i>
16	Sambar	<i>Cervus unicolor</i>
17	Barking Deer	<i>Mutiacus muntjac</i>
18	Assamese Macaque	<i>Macaca assamensis</i>
19	Rhesus Macaque	<i>Macaca mulatta</i>
20	Capped Langur	<i>Trachypithecus pileatus</i>
21	Hoolock Gibbion	<i>Hylobates hoolock</i>
22	Indian Wolf	<i>Canis lupus pallipes</i>
23	Red Fox	<i>Vulpes Vulpes</i>
24	Dhole	<i>Cuon alpinus</i>
25	Asian Black Bear	<i>Ursus thibetanus</i>
26	Alpine Musk Deer	<i>Moschus chrysogaster</i>
27	Gayal (Mithun)	<i>Bos frontalis</i>
28	Himalayan Serrow	<i>Naemorhedus sumatraensis</i>
29	Himalayan Goral	<i>Naemorhedus goral</i>
30	Mishmi Takin	<i>Budorcas taxicolor taxicolor</i>
31	Asiatic brush-tailed porcupine	<i>Atherurus macrourus</i>
32	Indian Hare	<i>Lepus nigricollins</i>
33	Pika	<i>Lagomorpha</i>
34	Chinese Pangolin	<i>Manis pentadactyla</i>
35	Indian Pangolin	<i>Manis crassicaudata</i>
36	Himalayan Mole	<i>Talpa micrura</i>
37	White tailed Mole	<i>Talpa leucura</i>
38	Himalayan Shrew	<i>Soriculus nigrescens</i>

39	Hodgson brown-toothed Shrew	<i>Episoriculus caudatus</i>
40	Asian House Shrew	<i>Suncus murinus</i>
41	<i>Etruscan shrew</i>	<i>Suncus etruscus</i>
42	Asian Gray Shrew	<i>Crocidura attenuate</i>
43	Chinese Mole Shrew	<i>Anourosorex squamipes</i>
44	Himalayan water Shrew	<i>Chimarrogale himalayica</i>
45	Lemur	<i>Nectogule elegens</i>
46	Northern Tree Shrew	<i>Tupaia belangeri</i>
47	Pteropus giganteus	<i>Indian flying fox</i>
48	Leschenault rousette (fruit bat)	<i>Rousettus leschenaultia</i>
49	Lesser short-nosed fruit bat	<i>Cynopterus brachyotis</i>
50	Greater short-nosed fruit bat	<i>Synopterus sphinx</i>
51	Ratanaworabhans fruit bat	<i>Megacrops niphanae</i>
52	Cave nectar bat	<i>Eonycteris spelaca</i>
53	Long-tongued fruit bat	<i>Macroglossus sobrinus</i>
54	Lesser mouse-tailed bat	<i>Rhinopoma hardwickii</i>
55	Long-winged tomb bat	<i>Taphozous longimanus</i>
56	Naked-rumped tomb bat	<i>Taphozous nudiventris</i>
57	Naked-rumped pouched bat	<i>Taphozous saccolaimus</i>
58	Lesser false vampire bat	<i>Megaderma spasma</i>
59	Treefoil horseshoe bat	<i>Rhinolophus trifoliatus</i>
60	Woolly horseshoe bat	<i>Rhinolophus pearsonii</i>
61	Dobsons horseshoe bat	<i>Rhinolophus luctus</i>
62	Blyths horseshoe bat	<i>Rhinolophus yunnanensis</i>
63	Least horseshoe bat	<i>Rhinolophus pusillus</i>
64	Rufous horseshoe bat	<i>Rhinolophus rouxii</i>
65	Intermediate horseshoe bat	<i>Rhinolophus affinis</i>
66	Greater horseshoe bat	<i>Rhinolophus ferrumequinum</i>
67	Pomona roundleaf bat	<i>Hipposideros Pomona</i>
68	Dusky leaf-nosed bat	<i>Hipposiderous ater</i>
69	Fulvus roundleaf bat	<i>Hipposiderous fulvus</i>
70	Ashy roundleaf bat	<i>Hipposideros cineraceus</i>
71	Cantors roundleaf bat	<i>Hipposideros galeritus</i>
72	Intermediate roundleaf bat	<i>Hipposideros larvatus</i>
73	Hodgsons bat	<i>Myotis formosus</i>
74	Himalayan whiskered bat	<i>Myotis annectans</i>
75	Hairy-faced bat	<i>Myotis annectans</i>
76	Asian barbastelle	<i>Barbastella leucomelas</i>
77	Harlequin bat	<i>Scotomanes ornatus</i>
78	Lesser Asiatic yellow bat	<i>Scotophilus kuhlii</i>
79	Greater Asiatic yellow bat	<i>Scotophilus heathii</i>
80	Brown long-eared bat	<i>Plecotus auratus</i>

81	Serotine bat	<i>Eptesicus serotinus</i>
82	Sombre bat	<i>Eptesicus tatei</i>
83	Lesser bamboo bat	<i>Tylonycteris pachypus</i>
84	Indian pipistrelle	<i>Pipistrellus coromandra</i>
85	Pipistrellus babu	<i>Himalayan pipistrelle</i>
86	Mount popa pipistrelle	<i>Pipistrellus paterculus</i>
87	Least Pipistrelle	<i>Pipistrellus tenuis</i>
88	Savi pipistrelle	<i>Pipistrellus savii</i>
89	Vesper bat	<i>Pipistrellus cadornae</i>
90	Chocolate pipistrelle	<i>Pipistrellus affinis</i>
91	Khuls Pipistrelle	<i>Pipistrellus Kuhlii</i>
92	Pegu pipistrelle	<i>Pipistrellus Peguensis</i>
93	Common bent-wing bat	<i>Miniopterus Schreibersii</i>
94	Greater tube-nosed bat	<i>Murina leucogaster</i>
95	Tube-nosed bat	<i>Murina tubinaris</i>
96	Painted bat	<i>Kerivoula Picta</i>
97	Hardwickes woolly bat	<i>Kerivoula hardwickii</i>
98	Black giant squirrel	<i>Ratufa bicolor</i>
99	Irrawaddy squirrel	<i>Callosciurus pygerythrus</i>
100	Pallas squirrel	<i>Callosciurus erythraeus</i>
101	Orange-bellied himalayan squirrel	<i>Dremomys lokriah</i>
102	Asian red-cheeked squirrel	<i>Dremomys rufigenis</i>
103	Red giant flying squirrel	<i>Petaurista petaurista</i>
104	Spotted giant flying squirrel	<i>Petaurista elegans</i>
105	Hairy-footed flying squirrel	<i>Bellamys pearson</i>
106	Giant flying squirrel	<i>Petaurista Magnificus</i>
107	Mishmi hills giant flying squirrel	<i>Petaurista mishmiensis</i>
108	House mouse	<i>Mus musculus</i>
109	Little Indian field mouse	<i>Mus booduga</i>
110	Cooks Mouse	<i>Mus cookie</i>
111	Fawn-colored mouse	<i>Mus cervicolor</i>
112	Flat-haired mouse	<i>Mus platythrix</i>
113	Rock-loving mouse	<i>Mus Saxicola</i>
114	Gairdners shrew mouse	<i>Mus Pahari</i>
115	Asiatic long tailed climbing mouse	<i>Vandeleuria oleracea</i>
116	Black Rat	<i>Rattus Rattus</i>
117	Himalayan Field Rat	<i>Rattus Nitidus</i>
118	Greater Bandicoot Rat	<i>Bandicota indica</i>
119	Lesser Bandicoot Rat	<i>Bandicota bengalensis</i>
120	Indo-malayan pencil-tailed tree mouse	<i>Chiropodomys glirodes</i>
121	Eurasian Harvest Mouse	<i>Micromys minutes</i>
122	Wood mouse	<i>Apodemus sylvaticus</i>

123	Millards Rat	<i>Dacnomys millardi</i>
124	White-bellid Rat	<i>Niviventer niviventer</i>
125	Tenasserim white-bellid Rat	<i>Niviventer tenaster</i>
126	Chestnut white bellied Rat	<i>Niviventer fulvescens</i>
127	Brahma white-bellied Rat	<i>Niviventer Brahma</i>
128	Smoke-bellied Rat	<i>Niviventer Eha</i>
129	Lesser bamboo Rat	<i>Cannomys badius</i>
130	Malayan Porcupine	<i>Hystrix brachyura</i>

Source: Borang, A. (2001). Mammalian fauna of Arunachal Pradesh (Checklist and distribution in protected areas), Arunachal Forest News, vol.19

APPENDIX-II

List of Birds

Sl.No.	Common Name	Scientific Name
1	Himalayan Monal	<i>Lophophorus impejanus</i>
2	Sclater's Monal	<i>Lophophorus sclateri</i>
3	Kalij Pheasant	<i>Lophura leucomelanos</i>
4	Grey-headed Woodpecker	<i>Picus canus</i>
5	Eurasian Woodcock	<i>Scolopax rusticola</i>
6	Common Buzzard	<i>Buteo rufinus</i>
7	Hen Harrier	<i>Circus cyaneus</i>
8	Long-legged Buzzard	<i>Buteo rufinus</i>
9	Black Eagle	<i>Lctinaetus malayensis</i>
10	Mountain Hawk Eagle	<i>Spizaetus nipalensis</i>
11	Common Kestral	<i>Falco tinnunculus</i>
12	Orange-billed leafbird	<i>Chloropsis hardwickii</i>
13	Long-tailed Shrike	<i>Lanius schach</i>
14	Eurasian Jay	<i>Garrulus glandarius</i>
15	Grey Treepie	<i>Dendrocitta formose</i>
16	Long-tailed Minivet	<i>Pericrocotus ethologus</i>
17	Grey-chinned Minivet	<i>Pericrocotus solaris</i>
18	Yellow-bellied Fantail	<i>Rhipidura Hypoxantha</i>
19	White-throated Fantail	<i>Rhipidura albicollis</i>
20	Ashy Drongo	<i>Dicrurus leucophaeus</i>
21	Brown Dipper	<i>Cinclus pallasii</i>
22	Long-tailed Thrush	<i>Zoothera dixonii</i>
23	Rufous-gorgeted Flycatcher	<i>Ficedula strophciata</i>
24	Slaty-backed Flycatcher	<i>Ficedula strophciata</i>
25	Golden Bush Robin	<i>Tarsiger chrysaeus</i>
26	Black Redstart	<i>Phoenicurus ochruros</i>
27	Hodgson's Redstart	<i>Phoenicurus hodgsonii</i>

28	Daurian Redstart	<i>Phoenicurus aureoreus</i>
29	Blue-fronted Redstart	<i>Phoenicurus frontails</i>
30	White-capped water Redstart	<i>Chaimarromis leucocephalus</i>
31	Plumbeous water Redstart	<i>Rhyacornis fuliginosus</i>
32	Slaty-backed Forktail	<i>Enicurus schistaceus</i>
34	White-crowned Forktail	<i>Enicurus leschenaultia</i>
35	Spotted Forktail	<i>Enicurus maculates</i>
36	Grey Bushchat	<i>Saxicola ferrea</i>
37	Eurasian Treecreeper	<i>Certhia familiaris</i>
38	Rusty-flanked Treecreeper	<i>Certhia nipalensis</i>
39	Winter Wren	<i>Troglodytes troglodytes</i>
40	Coal Tit	<i>Paurus ater</i>
41	Yellow-cheeked Tit	<i>Parus spilonotus</i>
42	Green-backed Tit	<i>Parus monticolus</i>
43	Yellow-browed Tit	<i>Sylviparus modestus</i>
44	Black-throated Tit	<i>Aegithalos concinnus</i>
45	Black-browed Tit	<i>Aegithalos iouschistos</i>
46	Asian House Martin	<i>Delichon dasypus</i>
47	Goldcrest	<i>Regulus regulus</i>
48	Mountain Bulbul	<i>Hypsipetes maclellandii</i>
49	Black Bulbul	<i>Hypsipetes leucocephalus</i>
50	Striated Prinia	<i>Prinia criniger</i>
52	Chestnut headed Tesia	<i>Tesia castaneocoronata</i>
51	Pale-footed Bush Warbler	<i>Cettia flavolivacea</i>
52	Japanese Bush Warbler	<i>Cettia diphone</i>
53	Brownish-Flanked Bush Warbler	<i>Cettia fortipes</i>
54	Aberrant Bush Warbler	<i>Cettia flavolivacea</i>
55	Grey-sided Bush Warbler	<i>Cettia brunnifrons</i>
56	Grey-sided Bush Warbler	<i>Cettia brunnifrons</i>
57	Lanceolated Warbler	<i>Locustella lanceolate</i>
58	Dusky Warbler	<i>Phylloscopus fuscatus</i>
59	Buff-barred Warbler	<i>Phylloscopus pulcher</i>
60	Ashy-throated Warbler	<i>Phylloscopus maculipennis</i>
61	Lemon-rumped Warbler	<i>Phylloscopus chloronotus</i>
62	Grey-hooded Warbler	<i>Seicercus xanthoschistos</i>
63	Grey-cheeked Warbler	<i>Seicercus poliogenys</i>
64	Chestnut-crowned Warbler	<i>Seicercus castaniceps</i>
65	White-crested Laughing Thrush	<i>Garrulax leucolophus</i>
66	Grey-sided Laughing Thrush	<i>Garrulax caerulatus</i>
67	Scaly laughing Thrush	<i>Garrulax affinis</i>
68	Chestnut-crowned Laughing Thrush	<i>Garrulax erythrocephalus</i>
69	Streak-breasted scimitar Babbler	<i>Pomatohinus ruficollis</i>

70	Rufous-capped Babbler	<i>Stachyris ruficeps</i>
71	Scaly-breasted Wren Babbler	<i>Pnoepyga albiventer</i>
72	Slender-billed Wren Babbler	<i>Xiphirhynchus supercialiaris</i>
73	Golden Babbler	<i>Stachyris chrysaea</i>
74	Grey-throated Babbler	<i>Stachyris nigriceps</i>
75	Red-billed Leiothrix	<i>Leiothrix lutea</i>
76	White-browed Shrike Babbler	<i>Pteruthius flaviscapis</i>
77	Black-eared Shrike Babbler	<i>Pteruthius melanotis</i>
78	Streak-throated Barwing	<i>Gampsorhynchus rufulus</i>
79	Cutia	<i>Cutia nepalensis</i>
80	Rusty-fronted Barwing	<i>Actinodura egretoni</i>
81	Chestnut-tailed Minla	<i>Minla strigula</i>
82	Red-tailed Minla	<i>Minla ignotincta</i>
83	Yellow throated Fulvetta	<i>Alcippe cinereal</i>
84	Rufous-winged Fulvetta	<i>Alcippe castaneiceps</i>
85	White-browed Fulvetta	<i>Alcippe vinipectus</i>
86	Nepal Fulvetta	<i>Alcippe nipalensis</i>
87	Rufous-backed Sibia	<i>Heterophasia capistrata</i>
88	Beautiful Sibia	<i>Heterophasia pulchella</i>
89	Striated Yuhina	<i>Yuhina castaniceps</i>
90	White-naped Yuhina	<i>Yuhina bakeri</i>
91	Whiskered Yuhina	<i>Yuhina flavicollis</i>
92	Stripe-throated Yuhina	<i>Yuhina gularis</i>
93	White bellied Yuhina	<i>Yuhina zantholeuca</i>
94	Fire-tailed Myzornis	<i>Myzornis pyrrhoura</i>
95	Spot-breasted Parrotbill	<i>Paradoxornis guttaticollis</i>
96	Black-throated Parrotbill	<i>Paradoxornis nipalensis</i>
97	Greater Rufous-headed Parrotbill	<i>Paradoxornis ruficeps</i>
98	Fire-breasted Flowerpecker	<i>Dicaeum ignipectus</i>
99	Green-tailed Sunbird	<i>Aethopyga nipalensis</i>
100	Black-throated Sunbird	<i>Aethopyga saturate</i>
101	Streaked Spiderhunter	<i>Arachnothera magna</i>
102	Russet Sparrow	<i>Passer rutilans</i>
103	Eurasian Tree Sparrow	<i>Passer montanus</i>
104	White Wagtail	<i>Motacilla alba</i>
105	White-browed Wagtail	<i>Motacilla maderaspatensis</i>
106	Grey Wagtail	<i>Motacilla cinereal</i>
107	Water Pipit	<i>Anthus spinoletta</i>
108	Rufous-breasted Accentor	<i>Purnella strophiate</i>
109	Maroon-breasted Accentor	<i>Purnella immaculate</i>
110	Black-headed Greenfinch	<i>Carduelis ambigua</i>
111	Tibetan Serin	<i>Cardulis Thibetana</i>

112	Dark-breasted Rosefinch	<i>Carpodacus nipalensis</i>
113	Dark-rumped Rosefinch	<i>Carpodacus edwardsii</i>
114	Creasted Bunting	<i>Melophus lathami</i>
115	Pine Bunting	<i>Emberiza leucocephalos</i>
116	Little Bunting	<i>Emberiza pusilla</i>
117	Chestnut-eared Bunting	<i>Emberiza fucata</i>
118	Chestnut-bellied Nuthatch	<i>Sitta castanea</i>
119	Scarlet Minivet	<i>Pericrocotus brevirostris</i>
120	Oriental white-eye	<i>Zosterops palpebrosus</i>
121	White-tailed Ruby throat	<i>Luscinia pectoralis</i>
122	White-throated Barbet	<i>Halcyon smyrensis</i>
123	Great Barbet	<i>Megalaima virens</i>
124	Blue-throated Barbet	<i>Megalaima australis</i>
125	Black-faced Laughing Thrush	<i>Garrulax affinis</i>
126	Emerald Dove	<i>Chalcophaps indica</i>
127	White-browed Fantail	<i>Rhipidura aureola</i>
128	Ashy Prinia	<i>Prinis socialis</i>
129	Red-Whiskered Bulbul	<i>Pycnonotua jocosus</i>
130	Red-vented Bulbul	<i>Pycnotus cafer</i>
131	Striated Bulbul	<i>Pycnonotus striatus</i>
132	Long-tailed Broadbill	<i>Psarisomus dalhousiae</i>
133	Golden-Fronted Leafbird	<i>Chloropsis aurifrons</i>
134	Little pied Flycatcher	<i>Ficedula westermanni</i>
135	Rufous-gorgeted Flycatcher	<i>Ficedula strophiate</i>
136	Blue Whistling Thrush	<i>Myophonus caeruleus</i>
137	Large Hawk Cuckoo	<i>Herococcyx sparverioides</i>
138	Greater Coucal	<i>Centropus sinensis</i>
139	Mishmi Wren-Babbler	<i>Spelacornis badeigularis</i>

Source: Adopted from the list of the bird species sighted by Dr. Pratab Singh (scientist, Wildlife Institute of India) and Alok Kumar (Forest Ranger) Dibang Valley.

APPENDIX-III

List of Snakes

Sl.No.	Common Name	Scientific Name
1	Black Krait	<i>Bungarus niger</i>
2	Banded Krait	<i>Bungarus bungarus</i>
3	King Cobra	<i>Naja bennah</i>
4	Indian Cobra	<i>Naja naja</i>
5	Pit Viper	<i>Trimeresurus monticola</i>
6	Python	<i>Python nolorus</i>
7	Reticulate Python	<i>Python reticulate</i>
8	Whip Snake	<i>Hierophis viri diflavor</i>

9	Checkered Keel back	<i>Xenochrophis piscator</i>
10	Striped Racer	<i>Elephe tainiura</i>

Source: National informatics centre, Ministry of Electronics and information centre, Government of India.

Viewed on 23rd September, 2019. (<https://roing.nic.in/mehao-wildlife-sanctuary>)

APPENDIX-IV

Expenditures on the noteworthy schemes of Dibang Wildlife Sanctuary

SL. NO	Particulars of works (1997-2012)	Expenditures (INR)
1	Construction and maintenance of check gate	60977
2	Watch and ward duties	111880
3	Protection of wildlife	169838
4	Creation of water holes, salt licks and watch towers	1401350
5	Construction of trekking path and foot path	1775899
6	Demarcation of boundary 10km including fitting&fixing of RCC pillars	102060
7	Construction of anti-poaching camp	700000
8	Purchase of research equipment's	600000
9	Engagement of protection unit and villagers for protection duty	1300074
10	Workshop at high altitudes	100000

Source: Dibang Valley Forest Department, provided by RTI activist Mr. Manmohan Mihu

APPENDIX-IV

'Sinu' and the Story of 'Popu' (folklore)

There was a priest name Sinu. He was very powerful and famous. He used to do much of the rituals in Tibet. He did not return to the Dibang for 10 years. A message mentioning the death of his wife was sent. The *Igu* said okay he will get another wife. After sometime another message was sent about his brother and sister dead. He said okay he will make another brother and sister. At last the message regarding his mother's death was send. Then he felt wife, brother and sister can be made but he shall not get another mother. This made him come back to Dibang.

While returning to his home he saw a snake standing in his path. He kicked the snake angrily by saying why are you standing in my path. He throttled the head. The snake didn't die but was injured. The snake thought of taking the revenge. He made up his mind that until the revenge the serpent will stay on the same spot. After few days Sinu was returning Tibet through same route. Sinu was bitten by that snake. He was badly injured and became sick. There is a big stone in Popu. Out of pain he kept his left hand in that stone and cried by taking the name of his mother. It is believed that locals identify one such stone with some palm like imprint.

Tamange Milli, Acheso Village

APPENDIX-V

Idu-Mishmi and the Takin: why the takins' horns are curved, the tail is short and why it has short *gyeana* after hunting? (the folklore)

Akru stays in the high mountains which always touches the cloud because it came from the cloud. Idu-Mishmi thought of rearing *akru* like the mithun. They went in the jungle to bring the *Akru*. While coming back there started a quarrel between the *Golo* and the Idu. *Golo* said this is the resources of the jungle and you can't take it without my permission. It results the tug of war between the *Golo* and Idu. *Golo* was pulling both the horn of the *Akru* and human was pulling the tail. Due the acute pressure the horn got curved and the tail broke off. After that incident the Takins horn permanently remained curved and the tail very short. After hunting takin, the hunter did not follow the *gyeana* and slept with his wife. Forever after, only the five days of *gyeana* is observed after hunting takin.

TadeMihu, male, *Igu* priest, Mihundo village

APPENDIX-VI

View of Anini from Coila Basti



Source: Field survey, June, 2019

APPENDIX-VII

Fast growing market place in Etalin, Dibang Valley



Source: Field survey, August, 2019

APPENDIX-VIII

Dibang, the sacred land for the Tibetans



Source: Kanki Miri, July, 2017

APPENDIX-IX

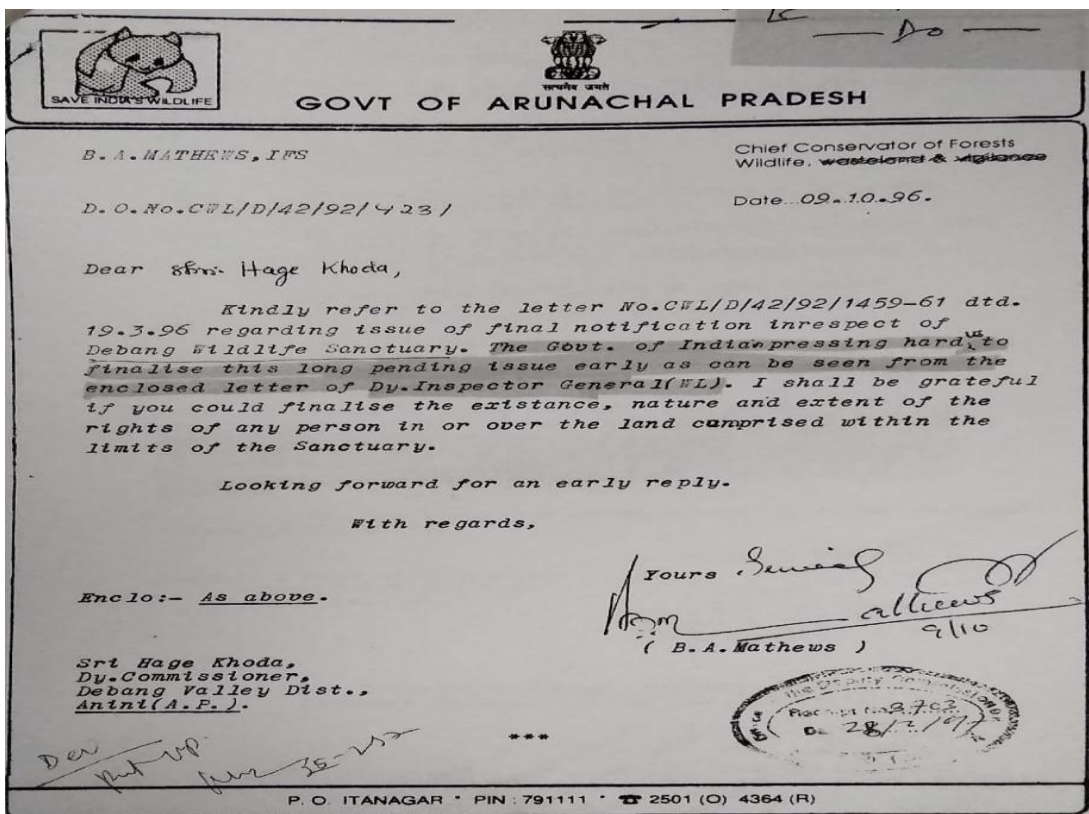
Takin Expedition, towards the base camp-I, Aworni



Source: Field survey, September, 2019

APPENDIX-X

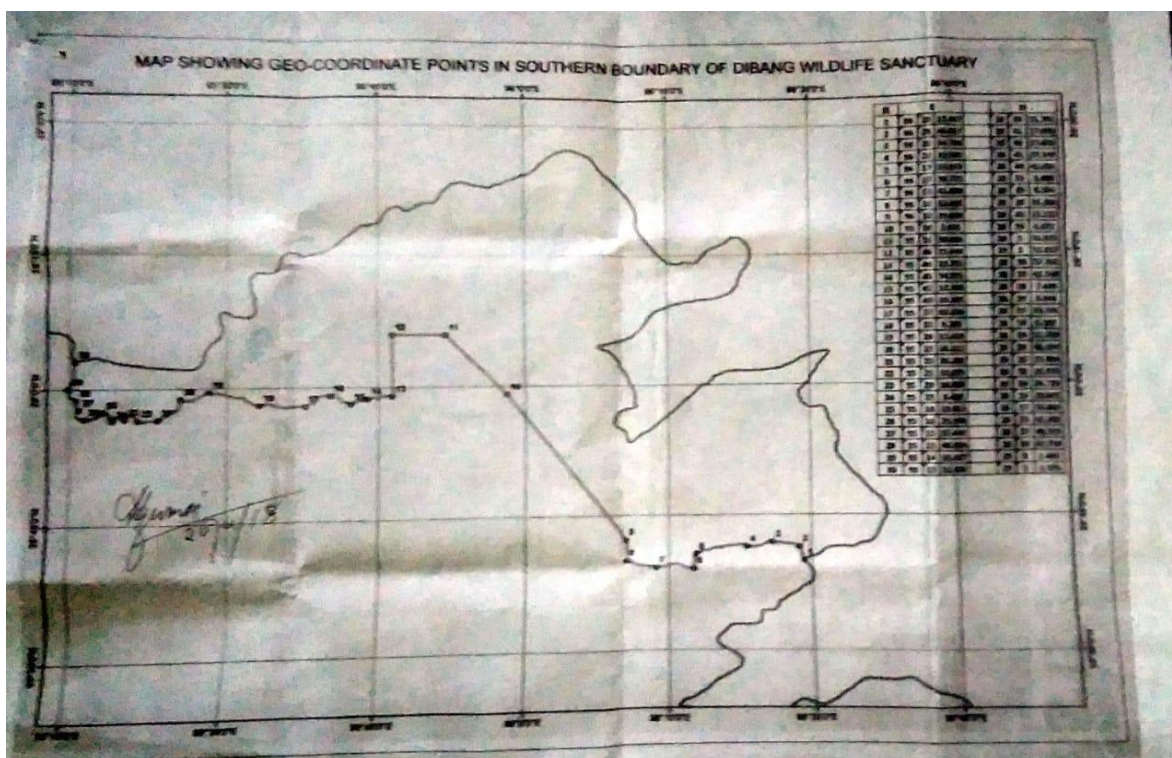
Letter from CCF to DC, Anini (in respect to wildlife sanctuary)



Source: Dibang Valley Forest Department, provided by RTI activist Mr. Manmohan Mihu

APPENDIX-XI

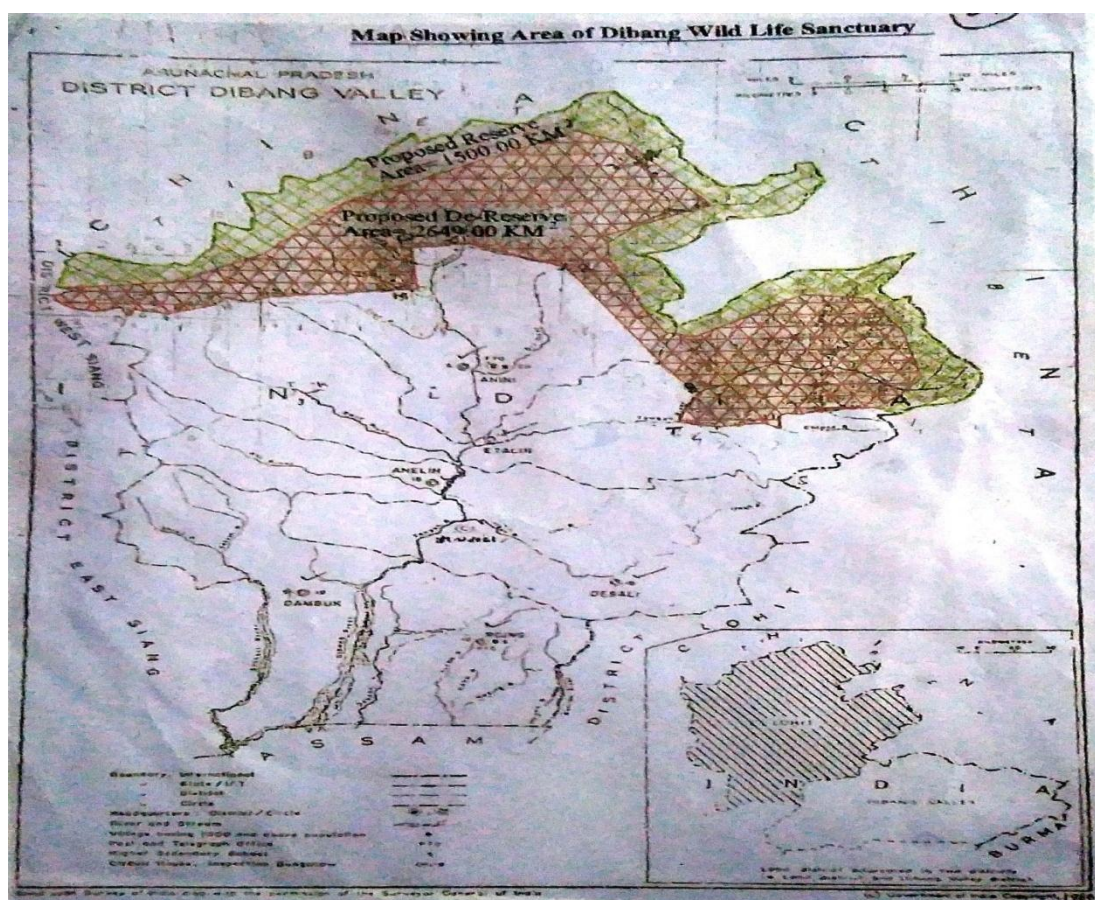
Dibang Wildlife Sanctuary earmarked by the officials



Source: Dibang Valley Forest Department. Provided by RTI activist Mr. Manmohan Mihu

APPENDIX-XII

Proposed Reserve and De-Reserve of the Sanctuary (Prepared by POPU Heritage Foundation)



Source: Dibang Valley Forest Department. Provided by RTI activist Mr. Manmohan Mihu

APPENDIX-XIII

Wildlife Protection Act, 1972 and amendment in 2006 (on Tiger Reserve)

Section 38V of the Wildlife (Protection) Act, 1972 (as amended in 2006) explains the core or critical tiger habitat as well as the buffer or peripheral area of a tiger reserve. Establishing the core / critical tiger habitat as 'inviolable' involves two steps as per the Wildlife (Protection) Act, 1972:

- a) Identifying the core / critical tiger habitat by establishing on the basis of scientific and objective area that such areas are required to be kept as inviolable for the purpose of tiger conservation, without affecting the rights of the Scheduled Tribes or such other forest dwellers, and notified as such by the State Government in consultation with an expert committee constituted for the purpose.
- b) Establishing the identified core / critical tiger habitat as inviolable through voluntary relocation on mutually agreed terms and conditions, provided that such

terms and conditions satisfy the requirements laid down in the Wildlife (Protection) Act, 1972. No Scheduled Tribes or other forest dwellers shall be resettled or have their rights adversely affected for creating inviolate areas for tiger unless:

- The process of recognition / determination of rights and acquisition of land or forest rights of the ST and such other forest dwelling persons is complete.
- The concerned agencies of the State Government need to establish with the consent of the ST and such other forest dwellers in the area, besides also consulting an ecological and social scientist familiar with the area, that the activities of the ST and other forest dwellers or the impact of their presence upon wild animals is sufficient to cause irreversible damage and shall threaten the existence of tigers and their habitat.
- The State Government has to obtain the consent of the ST and other forest dwellers and come to a conclusion (besides consulting an independent ecological / social scientist) that no coexistence options are available.
- Resettlement package needs to be prepared providing for livelihood of affected individuals, while fulfilling the requirements of the National Rehabilitation and Resettlement Policy.
- The informed consent of Gram Sabha's and affected persons has to be obtained for resettlement.
- The facilities and land allocation at resettlement area are to be provided, otherwise the existing rights of people shall not be interfered with.¹⁹

19 (<https://pib.gov.in/newsite/PrintRelease.aspx?rel...> Clarification by Minister of State for Environment and Forests on Tiger Reserves, Critical Wildlife Habitats and Forest Right Act, 2006). Accessed date: 07/11/19

