DEFORESTATION IN NAGALAND: A HISTORICAL PERSPECTIVE

Thesis submitted to Nagaland University in partial fulfillment for the award of the Degree of Doctor of Philosophy in History

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CERTIFICATE

This is to certify that the research data presented in this accompanying dissertation titled, **"DEFORESTATION IN NAGALAND: A HISTORICAL PERSPECTIVE"** has been carried out by Ms. Lanukumla Ao bearing Regd. No. 403/2010 under my direct guidance and supervision. The present work is original in its content and has not been submitted in part or full for any other degree or diploma in any other University/Institute.

It is further certified that the candidate has fulfilled all the conditions necessary for the award of the Degree of Doctor of Philosophy under Nagaland University.

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DECLARATION

I, Ms. Lanukumla Ao, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/Institute.

This is being submitted to the Nagaland University for the Degree of Doctor of Philosophy in History & Archaeology.

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Lanukumla Ao

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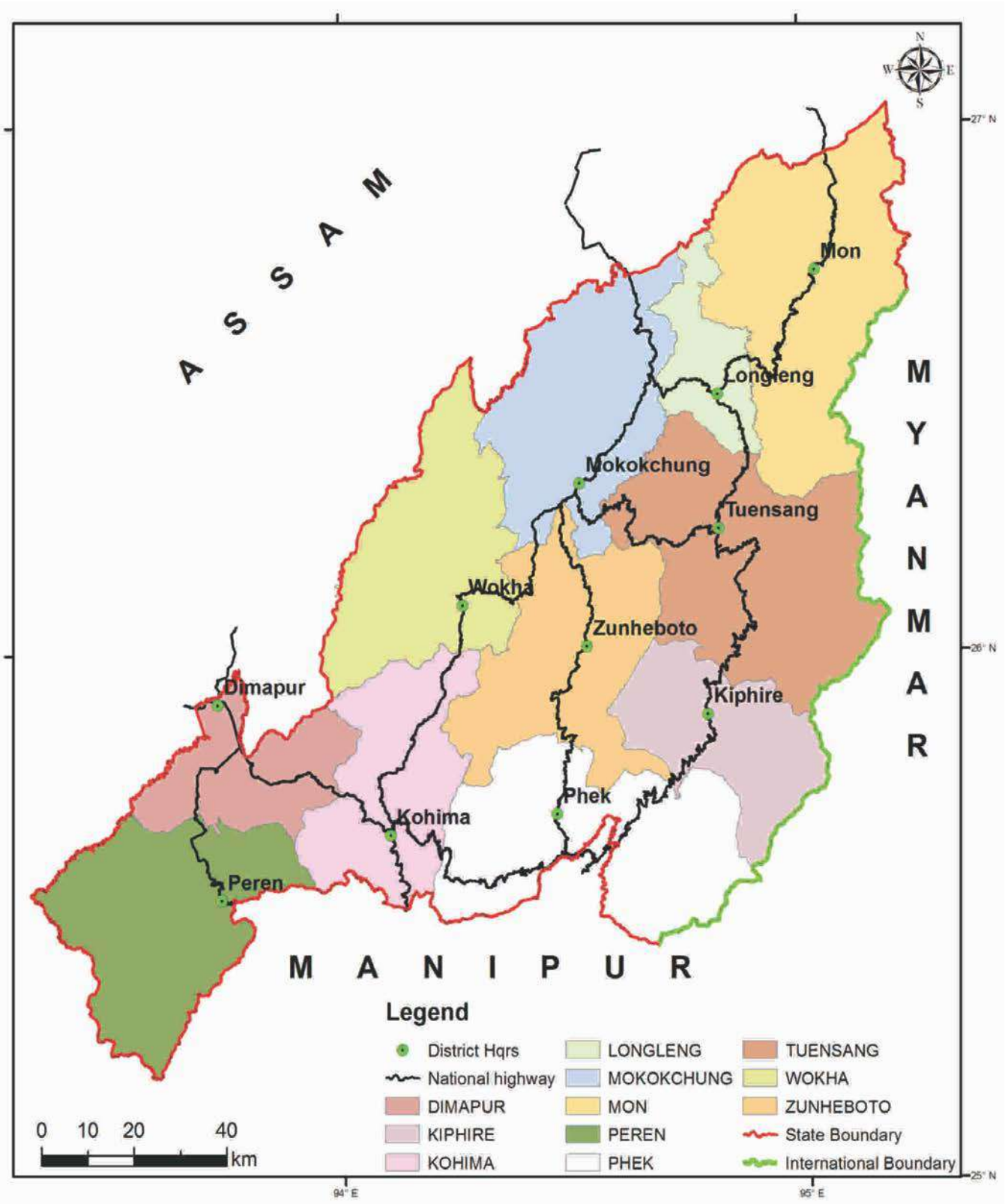

Figure1- Map of Nagaland indicating all the District Hqs

CHAPTER1

INTRODUCTION

Nothing in the world is static. There is constant change. Long before our hominid ancestor came on the scene, such all-embracing factors as plate-tectonics, worldwide changes of sea level, profound alterations in patterns of climate, and the evolution of new species of plants and animals have been continuously changing the face of the world. In response to such comprehensive change, more local changes of the kind we usually mean when we talk about environmental change were also taking place. Rivers changed their courses; rich alluvial soils were formed or swept away, the average annual rainfall of whole regions increased or decreased, and the balance of plant and animal populations altered. All these changes were ultimately due to the interplay of a multiplicity of factors, and our hominid ancestors initially must have been no more than an additional minor factor playing a very small part in all that was going on (Grove *et al*., 1998: 30). Early humans therefore, in a real sense were dominated and at the mercy of the environment, where environment has been profoundly affected by human activities. The awareness of men's dependence upon nature had a long ancestry; but the realization of the significant role of man as the maker and unmaker of nature has developed only recently (Arnold *et al*., 1996:3).Human history has been a story of prudence and profligacy and man's destructive role as far as his relation with the environment is concerned is quite evident today (Gadgil *et al.*, 1992: 1-5).

It is a common misconception that deforestation is only a contemporary incidence, gaining momentum in the tropical regions of the world dated back only to the 500s. The history of deforestation takes us back into the corridors of time when humans primarily occupied the earth.More than 40 years ago, H. Clifford Darby suggested that "probably the most important single factor that has changed the European landscape (and many other landscapes also) is the clearing of the woodland," and he may well have been right. Indeed, perhaps more of the earth's surface has been affected by this process than by any other single human activity.

(cited in William, 2006: XV). In addition to the natural, climatically induced changes, the human impact was early, widespread, and significant and the forests of the world changed accordingly. Across the globe, the first halting steps toward deforestation were under way. In the space of 10,000 years (a mere 500 generations) humans were going to have an effect on global vegetation only slightly less dramatic and widespread than that of the Ice Age in the 100,000 years before (ibid.: 11).

Studies have proved climate change even during Holocene period. Thought not characterised by the extreme climate fluctuations, it has been significantly variable (see Dansgaard *et al*., 1971; Denton and Karlen, 1973; Dunbar, 2000 and Fleitmann *et al*., 2003). A variety of geoscientific evidence also supports episodes of drought and forest fragmentation during the late Pleistocene.(Haffer and Prance, 2001: 582- 583) has also cited on Holocene climate change cycles of approximately 2500 years and 1500 years. Even in the Classical Age, there is mention of clearing of forest. The Greeks for instance, generally tended to fear and revere wild nature. They found meaning in the forest and thought of it as the original home of humankind where human sprang from oaks. But this ended with forest clearing; the fallen trees being linked to warriors slain in battle. In the Roman Age, there is evidence that nature was not being revered but being commodified, traded and sold and that its possessions was seen as a means to wealth and capital accumulation (ibid.:585-586). Man's encroachment on the forest, clearing trees for space to set up communities and using wood for fuel, as well as for building houses, furniture, boats and other equipment is as old as human existence on earth. But in the distant past, the smallness of human population in the midst of the vastness of the forest wilderness made the steady process of deforestation to appear almost insignificant. However, all that has changed since the mid-twentieth century is that an ancient domain has processed, and irreversibly damaged has occurred.

The evolution of the process and practice of deforestation is an interesting one. For instance, chopping down trees is part of an age-old human quest for shelter, food and warmth. Trees provide wood for construction, shelter and making a multitude of implement; wood provides the fuel to keep warm, to cook food and make it palatable, and even to smelt metal. Clearingof forest also requires no sophisticated technology. Humans with stone or flint axes need boundless energy to fell tress; in contrast, fire and browsing animals can wreak havoc with little effort. The substitution of metal for

stone axes circa 3, 500 years ago, and then for saws in the medieval period, eased the backbreaking task of clearing, and accelerated the rate of change, but it did not alter the basic process of destruction and land-use transformation. Power-saws during the last fifty years have made a major impact. Perhaps the only reason why there were no significant effects at that time is because of demographic issues. As population increased from circa 1000 BC to AD 800, deforestation increased, soil erosion accelerated, and essential nutrients such as phosphorous were rapidly leached out of the soils of this potentially fragile environment. Productivity must have declined dramatically. Certainly, population numbers plummeted. The collapse of the Copan Mayan state between AD 850 and 1250 is also attributed unequivocally to growing population, agricultural intensification, fuel wood demands, deforestation, soil erosion, and lowering agricultural productivity (William, 2006:50-51). Since the advent of industrialization began deforestation processes continued and even rose to bigger numbers. During those times, timber was in great demand, thus, business of logging grew in astounding counts. But the probable effect to the forest was not seen. Whenever forests were depleted, men went from place to place in search of new fresh source to meet their ends.

The use of soils in a slash-and-burn method for creating short-term goals contributes to deforestation. Slash-and-burn is a method of agricultural cultivation that involves the cutting and burning of plants in forest or woodlands to create fields for farming. It is typically practiced in shifting/*jhum* cultivation agriculture and in human migratory livestock herding (Walters, 2007:3). Areas of forest are burned and cleared for planting; the ash provides some fertilization and the plot is relatively free of weeds. After several years of cultivation, fertility declines and weeds increase. Traditionally, the area was left fallow and reverted to a secondary forest of bush. Cultivation would then shift to a new plot; after about a decade the old site could be reused. Historically, slash-and-burn cultivation has been an agricultural practice throughout much of the world, in grasslands as well as woodlands. Since Neolithic times, slash-and-burn techniques have been widely used for converting forest into crop fields and pasture (Awe, 2006: 104). Clearing fields by fire was practiced even before the Neolithic. Hunters-gatherers used fire to clear fields to attract game animals and to facilitating the growth of edible plants such as berries.

During the Neolithic Revolution, significant agricultural advancements were made. Groups of hunters-gathers domesticated various plants and animals, permitting them to settle down and practice agriculture. This practice provided more food per hectare than hunting and gathering. This happened in the river valleys of Egypt and Mesopotamia. As human populations increased with less dependence on obtaining food by hunting, agricultural cultivation became more important. There were people who could easily cultivate their crops in large fields along river valley. But there were others who had to clear forests to obtain farming land. Therefore slash-and-burn agriculture was the means used by ancient human populations to clear more land to make it suitable for plants and animals (see Steward, 1956). Slash-and-burn is a method of cultivation often used by tropical-forest root-crop farmers in various parts of the world and by dry-ice cultivators of the forested hill country of South East Asia. It likely is the main reason why gigantic land areas have been totally exhausted and eroded. Such lands are of no use for any form of cultivation at the present time. Beyond doubt, the demand of growing businesses have endangered the forests ever since (ibid.).

A significant percent of global population has a direct relationship with forest and trees. In every region of the world, there are communities that live within or immediately adjacent to forested areasthat depend on them for sustenance. It has been estimated that one quarter of the world's poor depend directly or indirectly on forest for their livelihood[1]. The world vegetation cover under natural forests has been depleting fast and significant portion of such areas is being converted to man-made plantation forests mainly for timber trees, to meet the growing need of the ever increasing human population.Moreover, human activities have altered the earth's environment by changing the land use and land cover in the past several centuries. More than 1.6 billion people depend to varying degrees on forest for their livelihood. Out of this, 60million people are almost wholly dependent on forest and 350million people live within or adjacent to dense forests for subsistence and income[2]. Therefore, global environmental concerns have of late led some historians to study the environmental aspects of the past human societies. Environmental change is arguably the most pressing and potentially disastrous problem facing the global community. Population, global-warming, species extinction and massive disruptions of critical ecosystems have become common place topics (Cumley, 1994: 1).

Deforestation, in the strictest sense means the replacement of forest by non-forest. FAO and World Bank implicitly assume that both permanent and temporary removal of forest cover constitute deforestation. In so doing, they include as "deforestation" large areas of shifting cultivation that will eventually return to secondary forest status. This definition, therefore, greatly enlarges both the area assumed to be deforested and the role of shifting cultivation in over- all deforestation (World Bank, 1990:3,147; also see FAO, 1990).Lund (1999) characterized deforestation as the long-term or permanent removal of forest cover and conversion to a non-forested land use[3].Although deforestation first became a serious concern in the 1950s, it has been an issue since human began making fires hundreds and thousands of years ago. Small scale deforestation was practiced by some societies for tens of thousands of years before the beginnings of civilization. The first evidence of deforestation appears in the Mesolithic period(Brown, 1997: 133). It was probably used to convert closed forests into more open ecosystems favorable to game animals. With the advent of agriculture, larger areas began to be deforested, and fire became the prime tool to clear land for crops. According to Omer Stewart (1956), fire is, "the first great force employed by man," and it was crucial in the story of deforestation. With fire, humans accomplished the first great ecological transformation of the earth, to be followed much later by two others of the same order of magnitude: the development of agriculture and animal husbandry 10,000 years ago, and the rise of large-scale industrial production a little less than 200 years ago. Humans assimilated fire into their biological heritage, thereby gaining access to the world's biota, and the biota, in turn, acquired a new regimen of fire transformed by human society (William, 2006: 13). Jared Diamond, a geographergives an extensive look into the collapse of the ancient Eastern Islanders in his book *Collapse*(2005). The disappearance of the island's trees seems to coincide with a decline of its civilization around the 17th and 18th century. He attributed the collapse to deforestation and over- exploitation of all resources.

Global deforestation sharply accelerated around 1852. Estimates reveal that if the present day rate of development continues unabated, the depletion of the biosphere to the point of instability would occur in the second half of the next century. We are presently spending the potential energy of the biosphere at ten times the rate it is being accumulated by living organisms that can absorb sunlight. At least 60 percent

of the forests of the planet have been lost. It is estimated that about half of the Earth's mature tropical forest, that is between 7.5 million and 8 million km² (2.9 million to 3 million sq m) that until 1947 covered the planet – have now been destroyed (Nelsen, 2006:35). Some scientists are predicting that if the present level of destruction goes on, by 2030 there will only be 10% of our forest remaining, with another 10% in a degraded condition and 80% totally lost (Wilson, 1988:4). Depletion of forest means, increasing the carbon dioxide in the atmosphere, which is the root cause of global warming. It was reported in May, 2013, that readings for CO_2 taken at the world's primary benchmark site in Mauna Loa surpassed 400ppm[4]. In 2012, studies suggest that in 20 years, 25% of all mammal species could be extinct. It is also estimated that if the present rate of extinction is not halted, up to 30% of all species will be extinct by 2050. Of these, about one eight of known plant species will be extinct[5]. Records of the geological past shows that ecosystems have some capacity to adapt naturally to climate change but this resilience has never been challenged by a large global human population and its multi-faceted demands and pressures on ecosystems. The resilience of many ecosystems is likely to be exceeded by 2100 by an unprecedented combination of change in climate, associated disturbances (e.g. flooding, drought, wildfire, insects, ocean acidification), and other global change drivers (e.g., land-use change, pollution, over-exploitation of resources(State Forest Report, 2013:291-292)Humphrey in April 2006 refers that current trends of agricultural expansion and deforestation in the Amazon indicate that, by 2050, 40 percent of the Amazon forests will be lost, with one quarter of the 382 mammalian species examined losing two-fifths of their Amazon forest ranges. Humphreys says that ―global environmental degradation is the most critical public welfare issue of our age. The *Guardian* also reported that razing of forests is a major contributor to the emissions that drive climate change. Trees provide a vital store of carbon, as well as providing livelihoods for a billion people. Destruction of the Amazon rainforest has increased by almost one-third in the past year, reversing a decade-long trend of better protection for the world's greatest rainforest[6].

In many countries, deforestation, both naturally occurring and human induced, is an ongoing issue. The term deforestation is often misused to describe any activity where all trees in an area are removed. However in temperate climates, the removal of all trees in an area—in conformance with sustainable forestry practices—is correctly

described as regeneration harvest[7]. In temperate mesic climates, natural regeneration of forest stands often will not occur in the absence of disturbance, whether natural or anthropogenic[8]. Furthermore, biodiversity after regeneration harvest often mimics that found after natural disturbance, including biodiversity loss after naturally occurring rainforest destruction(Sahney*et al*., 2010: 1079-1082).

Deforestation occurs for many reasons: trees are cut down to be used or sold as fuel (sometimes in the form of charcoal) or timber, while cleared land is used as pasture for livestock, plantations of commodities and settlements. The removal of trees without sufficient reforestation has resulted in damage to habitat, biodiversity loss and aridity. It has adverse impacts on bio-sequestration of atmospheric carbon dioxide. Deforestation has also been used in war to deprive the enemy of cover for its forces and also vital resources. Modern examples of this were the use of Agent Orange by the British military in Malaya during the Malayan Emergency and the United States military in Vietnam during the Vietnam War. Among countries with a per capita GDP of at least US$4,600, net deforestation rates have ceased to increase[9]. Deforested regions typically incur significant adverse soil erosion and frequently degrade into wasteland.

Disregard or ignorance of intrinsic value, lack of ascribed value, lax forest management and deficient environmental laws are some of the factors that allow deforestation to occur on a large scale. In many countries, deforestation, both naturally occurring and human induced, is an ongoing issue. Deforestation causes extinction, changes to climatic conditions, desertification, and displacement of populations as observed by current conditions and in the past through the fossil record.According to the United Nations framework convention on climate change (UNFCCC) Secretariat, the overwhelming direct cause of deforestation is agriculture. Subsistence farming is responsible for 48% of deforestation; commercial agriculture for 32% of deforestation; logging is responsible for 14% of deforestation and fuel wood removals make up 5% of deforestation (UNFCCC, 2007: 81).Other causes of contemporary deforestation may include corruption of government institutions, the inequitable distribution of wealth and power, population growth and urbanization. Globalization is often viewed as another root cause of deforestation, though there are cases in which the impacts of globalization- new flows of labor, capital, commodities, and ideas have promoted localized forest recovery[10]. In 2010, the United Nations

Food and Agriculture Organization (FAO) found that during the period 2000-2010, worldwide deforestation mainly due to conversion of forests to agricultural lands, was responsible for the loss of 5.2 million hectares of forest per year of 140km^{2}of forest per day[11]. Thus deforestation, being a subject of prime concern of today's fast deteriorating environmental scenario, needs to be seriously considered and treated with. Attention must be drawn to numerousdiscourses from particular to general, in order to comprehend the processes and to take effective measures there upon.

In Indian society, right from ancient times, forests played a dominant role in her history. Many tribal religions are founded on a community's relationship with its natural environment. Shrines are situated deep in the forest and often there is a sacred grove of trees by the village, which express and make conscious people's relationship with their environment and each other. The *Rig-Veda* establishes the symbolism of close kinship with the environment when it says: "Heaven is my father; my mother is this vast earth, my close kin" (Rig Veda, 1.164.33). The *Atharva-Veda* contains-Bhumi Sukta-in praise of the earth and invokes a balance: upon the immutable, vast earth support by the law, the universal mother of the plants, peaceful and kind, may we ever walk forever". The elaborate Vedic ritual of "Athiratram" had, as its precise objective the generation of a positive impact on man and the environment and continues to be performed to this day with the same fervour and faith[12]. The Mahabharata in one of its profound ecology perceptions compares the trees to the universe; it says that he who "worships the ashvattha (peepal, holy fig tree) worships the universe. The tree was seen as a symbolic representation of universe with a single trunk and its multiple branches of manifestation. The legendary philosopher of Tanrilakan, Therivalluvar, talks of nature as man's fortress. If he destroys her, he remains without protection[13].

No doubt, there was wave of clearance of the forest in the ancient Indian history. The Smriti Vedas or the Vedas for Kali Yuga, which constitutes a branch of Hindu religious literature, includes two epic poems: *Mahabharata* (composed by sage Ved Vyasa) and *Ramayana* (composed by sage Valmiki), contains umpteen reference to forests. According to these, the land originally was under tree cover, but as human settlements expanded, trees were cleared to make way for cultivation. The legend is that king Prithu milked the earth (*Prithvi*) in the form of a cow, signifying the start of agriculture. Prithu is also credited with the feat of clearing forest and establishing the

organized agricultural settlements and townships (Kumar, 2008: 301). The Arthashastra too advocates the clearing of forest. Nevertheless, there are people who worship the big trees as a dwelling place of some deities. Felling of big trees is taboo in many parts of thecountry. Ancient Indian History also mentions about the Indian sages meditating and taking hermitages in the forest. In the third of the four stages of life, an Aryan led the life of a forest hermit (Goswami, 2012: viii). Therefore forest was an indispensable part of man's life. The forest hasalways been revered by the people in their daily life and is inseparably inter woven with the progress of civilization. India's forests constitute an integral part of the world's widespread ecosystem. Besides, ensuring ecological security to all forms of life and being used as the very essence of life for a large section of the society, our forests are the vital resources for development (Bora, 2012: 19).

The second half of the nineteenth century marked an important watershed in the history of India, with the establishment of the British governance. In the name of agricultural expansion, there are reports concerning the simultaneous onset of deforestation. Deforestation, driven by agricultural expansion and aggravated by the extraction of forest biomass at unsustainable levels, has long been recognized as a dominant trend in the history of Indian land use. However, the displacement of forest vegetation by agriculture has by no means been limited to the colonial period alone. A reconstructed map of land use in the seventh-century India, based on reports by Chinese traveler Huien Tsang (c.AD 624-642), indicates that extensive agricultural development had already taken place at that time (Banerjee,1966: 29). A second map, based on sixteenth-century revenue records and contemporary traveler's reports, indicates that extension of agricultural land caused further deforestation of the Gangetic plain, and also displaced woody vegetation on lowland Peninsular India during the medieval period (ibid.).

In Aligarh district before 1820, the northern part in particular and then Bulandshahar district was covered with thick *dhak jangal.* Most of this jangal was cut down in the following three decades. The rest of the *dhak jangal* disappeared in the second half of the nineteenth century. In the mid-1820s there was still *dhak jangal* around Bharatpur but around 1850, there was no remaining forest in the area beyond a small patch south of Bharatpur. According to a contemporary observer, the belt of *jangal* up to 3 miles wide disappeared in the ten years following British arrival there.

The British often established their authority over newly acquired land with the method of forest clearance. Similarly, large areas of *jangal* were destroyed to deny robbers and other criminal elements, commonly known as “dacoits and bandits”, of their hiding places. To prevent any threat to agrarian expansion, the *jangal* was cleared when it offered protection to tigers and other wild animals (Mann, 1998: 408).In 1820s,however, attempts were made by medical surgeons to establish conservancies or teak plantations in Malabar, in Bengal, or in Burma between 1805 and 1822 (in connection with war-time timber shortage). As early as the 1820s, some of the surgeons lobbied heavily against the deforestation taking place during that decade and argued in favour of plantation programmes. Nathaniel Wallich, the director of the Calcutta Botanical Garden was pre-eminent among these early campaigners. In spite of these early efforts, a direct connection between decline in forest area and apparent regional increases in desiccation of forest in India was not put forward as an argument for controlling deforestation until the end of 1830. Throughout the 1820s and 1830s, anxieties about deforestation were already frequently expressed. Bishop Heber, for instance, warned in1824 that excessive deforestation, of the kind he had observed in the Siwalik foothills, might lead to a more general aridity (Grove, 1997: 69-70). By 1847, then, the supremacy of the medical service in its hold over government environmental policy had become well-established and was further institutionalised in Gibson's Superintendency of the Bombay Forest Department. This department was formed with the prime aim, not of securing a steady supply of timber (though this was still a pressing concern), but of inhibiting the whole range of environmental and social consequences which deforestation might cause.Thefear of these consequences, especially the fear of widespread climatic change, forced the colonial state to comply with a conservationist prescription (ibid.:78).The Imperial Forest Department was then established in India in 1864. British state’s monopoly over Indian forests was first asserted through the Indian Forest Act of 1865. This law simply established the government’s claims over forests. The British colonial administration then enacted a further far-reaching Forest Act of 1878, thereby acquiring the sovereignty of all wastelands which in its definition included all forests. This Act also enabled the administration to demarcate reserved and protected forests. These colonial laws brought the forests under the centralized sovereignty of the State. Thus, in colonial times, forest was utilized for the interests of the government and was exploited. Forest areas became a source of revenue.

In the aftermath of 1857 Mutiny, the East India Company was replaced by the British Crown as the Colonial government of northern India. As a matter of military policy, the new administration invested massively in railway development (Flint, 1998: 437). The building of the railway network in 1853, for creating a market for British goods and the outlet for British capital seeking profitable avenues for investment, was a crucial watershed in the history of Indian forestry. In India, few timber species were sufficiently strong, tough and resistant to termites and fungal decay to be used as railway sleepers, and only three meeting these criteria were available in large quantities: Sal and deodar (*cedrus deodara*) in northern India, and teak (*Tectona grandis*) in the south. Accessible forests of all three species were ruthlessly over felled by zealous contractors responding to the unprecedented demand for timber during the first decade of railway expansion (ibid.). As a result, considerable areas of forest in northern and central India were subjected to ruinous over exploitation. Many trees were cut which could not be extracted economically, so left to rot unutilized where they had fallen, increasing the fuel load in the forest vulnerable to frequent fires.

The genesis of shifting cultivation as an indigenous agricultural system mostly in the hilly tribal regions that is the north-eastern states, Orissa, Central India and the Western Ghats also contributed to deforestation to some extent. Shifting cultivation evolved as a form of land use to circumvent major problems of tropical agriculture like soil erosion, low nutrient status and pest pressures (Mc Grath, 1987: 2). It is the brief period of utilization, small size of the plots and far-reaching preservation of the original surface roughness and soil texture due to residual tree stumps, absence of leveling etc, which prevented intensive erosion (Flint, 1998: 437). When population pressure on land was low and fallow periods long, much of the land under this system remained under various succession stages of natural vegetation. In other words, the forest always reclaimed what humans cleared. However, during the colonial rule, the pressure on land grew or was hugely intensified to generate an economic surplus from the forest. Therefore, a tendency arose to create fields by permanently clearing the forest. The Forest Department's attempt to preserve the forest by forbidding tribal's customary cutting of trees has had a divide-and-rule effect on tribal's and the forest. Tribal's reacted to the restrictions on their customary rights by cutting whatever they can get away with, of what they used to regard as their own forest (Padel, 1998: 899).

From the 1860's and 1870's, the reserving of India's forest was motivated partly by concern that a vital source of government revenue was being depleted. But the forest service which was set up to protect the forest, from the start actually did the opposite, generating revenue by selling timber to supply the railway. The government blamed deforestation on the tribal practice of shifting cultivation. The Forest Service, therefore, set up a system of forest guards, towing tribal areas to register reserved forest and prevent the unauthorized cutting of trees. But the practice of shifting cultivation was, and is, such an integral part of the way of life of the tribal communities, that it could not be stopped (ibid.). Another important factor that posed threat to forest in India is grazing and forest fire. Against a sustainable 31 million cows unit per annum, nearly 99 million units are found in free and unrestricted grazing in about 78 percent of the forest areas. Annually, forest fire burn about 0.5 million hectares of forest. Research has established that burnt forests are the sources of flash floods and heavy sediment discharges (Bora, 2012: 31).

With India's independence, in the name of development, a new form of oppression has accompanied the assault on the environment by the establishment of industries. The national interest for the development of industrial projects led to huge eviction of people and the land. Mining for coal, iron and other like minerals has also led to the displacement and hampering of the environment. During 1980-2005, close to 0.1 million hectors of land was diverted across the country to make way for 1,200 mines. This diversion has destroyed ecosystems as well as livelihoods (Centre for Science and Environment, 2012: 8). Between 1940's and 1960's, enormous reservoirs were created by the construction of dams in association with industrial expansions. For instance, the Hirakud dam in Orissa(1948), the Bhakra Nangal dams in Himachal Pradesh(1954), the Rihand dam and the reservoir in UP (1961) etc., were constructed. This big industrial project displaced not only the people from their lands but effects the environment in the long run and invites social disaster.

The National Forest Policy (1952 and 1988) stipulated to maintain one-third of the total geographical areas of the country under tree cover. The policy states that the forest should not be looked upon as a source of revenue but to be protected and enhanced for the well-being of the people and the nation (ibid.: 19). However, there was no halt in the process as many of the forest lands were diverted to other purposes. In 1953, the government nationalized the forests which were earlier with the

Zamindars. India also nationalized most of the forest wood industry and non-wood forest products industry. Over the years, many rules and regulations were introduced by India. In 1980, the conservation Act was passed, which stipulated that the central permission is required to practice sustainable agro-forestry in a forest area. Violations or lack of permits was made a criminal offense. These nationalization wave and laws intended to limit deforestation, conserve biodiversity, and save wild life. However, the intent to these regulations was not matched by thereality that followed. Deforestation increased, biodiversity diminished and wildlife dwindled. India's rural population and impoverished families continued to ignore the laws passed, and use the forests near them for sustenance (FAO, 2001). As per the Desertification and Land Degradation Atlas of India published by the Space Application Centre in 2007 about 32.07% of the land is undergoing various forms of degradation and 25% of the geographical area is affected by desertification. About 69% of the country's lands are dry lands, and degradation of these lands has severe implications for the livelihood and food security of millions. It is worth noting that India occupies only 2.4% of the world's geographical area, yet supports about 16.7% of the world's human population; it has only 0.5% of the world's grazing land but supports 18% of the world's cattle population. Thus there is tremendous pressure on our land-based natural resources, and sustainable land management is crucial for sustainable development (State Forest Report, 2013: 285).

Climate change is a global phenomenon but adversely affects developing countries particularly as their capacity and resources to deal with the challenge is limited. India is already vulnerable to a large degree of climate variability. Climate has played a major role throughout the Indian history. The rise and fall of the Indus Valley Civilization is strongly linked to climate. The ancient cities of Harappa and Mohenjodaro in the northwestern region of ancient India that flourished between 2800 and 2600 BC had large granaries, an evidence of strong agriculture. However, cities were abandoned in 1900 BC. Among many hypothesis, climate drying is considered a plausible explanation (see Singh, 1971). The rainfall at that time ranged between 400 and 800 mm per annum (see Lamb, 1982: 387). Fairservis (1967) also concluded that too many demands were being made on the soil and water resources of the region. Deforestation of the galley forest (riparian forest) may have exacerbated flooding of the cities developed along the river and the floodplains. Recent studies indicate that

climate change may exacerbate the problem of existing climate variability in India. It is projected that, by the end of 21st century, rainfall in India may increase by 15-40% with high regional variability. Warming may be more pronounced over land areas with northern India experiencing maximum increase. The warming could be relatively greater in winter and post-monsoon seasons. The annual mean temperature could increase by 3°C to 6°C over the century(ibid.).

1.1: Deforestation in North-East India

The North Eastern Region (NER) comprises of the states of Arunachal Pradesh, Assam, Manipur, Nagaland, Mizoram, Sikkim and Tripura. The region stretches between 21°50' and 29°34' N latitude and 85°34' and 97°50' E longitude. The region has a geographical area of 26.2 million hectare which is 8% of the area of the country. Assam is situated in the center and hill states (except Sikkim) are situated around it. Out of the total geographical area, 28.3% has an elevation more than 1200 m, 17.9% between 600 and 1200 m and about 10.8% between 300 m and 600 m above mean sea level. The hilly areas of the region are sparsely populated (63 people/km²) compared to plains (369/km²). The region has about 72% area under hilly ecosystems. The region has inaccessible terrain, fragility, marginality, excessive sloping land with rolling topography, rich biodiversity, unique ethnicity and socio-ecological set up (Das*et al*.,2009: 32).It is a common knowledge that the economy of North east region remained dominated by forest based activities. Shifting cultivation, which began during Neolithic period, is still practiced in many areas and at least 1.5% of the region still practices this type of cultivation (Maiti and Chakrabarti, 2002: 1-10). According to State of Forest Report 2013, Ministry of Forest and Environment, Government of India, a major threat of forest of India are in the NE states. From ancient times, the locals have practiced slash-and-burn shifting cultivation to grow food. The tribal people consider it a traditional and economic ecosystem. However, the slash and burn causes damage to a dense forest, to soil, to flora and fauna as well as pollution leading to climate change. Large scale deforestation has attributed to the decline in rainfall in Cherrapunjee, which was once famed as the recipient of heaviest rainfall in the world. The decline in rainfall was strengthened by the chronic crisis of drinking water (Nag, 2008: 23). The assigned reasons for the scarcity were that the soil was not able to absorb, retain and store the rain water. The obvious cause was found to be large scale deforestation resulting in

loss of top soil (ibid.: 25). Khasi Hills Meghalaya, an area where natural hazards viz., earthquake and rainfall induced landslides combined with high biotic pressure viz., deforestation, surface mining of limestone and coal, shifting cultivation have accelerated the environmental degradation processes, leading, in many places, to complete degradation of vegetation cover and soils (Prokop and Bhattacharyya, 2011: 258-262).Between 2010 and 2012, satellite studies confirmed a net loss of forest cover over these NE states (StateForestry Report, 2013).

Besides, there are different kinds of forest ownership system in this region. Almost half of the total population of the rural areas in N-E India would be depending on forest for their food, fodder, fuel, shelter, fiber, timber etc. The episode of deforestation in NE India is indifferent from the state of deforestation as a whole in the country. The change in forest area cover in this part of the country clearly indicates the process of deforestation to some extent.Accounting to an area approximately 2, 62,230 sq km,and the zone was highly saturated with thick forest cover, which was conspicuous up to the 7^{th} decades of the nineteenth century. As per the 1971, census the population density in the forested track stands at 52 people. On the contrary, the 2011 census displays a substantial increase in the population density, which stands at 148. As such, through a survey conducted by the FSI (2009-2011), confirmed that the overall net rate of deforestation was relatively high in the NE region with -0.90 to -5.29 destruction of forest (Reddy *et al*., 2013: 1492). Even after the enactment of New Forest Policy, 1988 by the Ministry of Environment and Forests, Government of India the process of deforestation still continues.Large scale deforestation has already put a threat to the mode of life of the people. NE India, like other parts of South Asia, faces problems interfacing population pressure, and the absence of alternative living means other than agricultural activities has been stimulating people to encroach the forest land. In consequence, the tribal's has started facing crisis to their traditional practice associated with the forest. The people accustomed with forest environment and ecological ethics have started losing their habitats, food, cultural practices based on available physical environment and mode of co-existence with nature. Ruthless deforestation coupled with the frequent inter-state border conflict pushed the tribes from the forest areas. Absence of timely intervention and reduction of population size has opened the door for reckless exploitation of forest wealth and creates a congenial ground for the extremist out fits in the forest belt

areas (Goswami, 2012: 16-17). Under such a scenario, it has become very important to analyze on the varied aspect of deforestation and its impact on the people and also to look into the sensitive issue of political ecology.

1.2: Environmental history of India: An overview

Deforestation has also been a priority concern for historians dealing with the environmental history of the country as it deals with land, forest, the people and culture, and economic base associated. Such environmental historical research is relatively new for historians, and literature on environment history in general and Naga Hills in particular is scanty.Many researches had already been done on various subjects related to the colonial phase of the British rule. The impact of the British forest policy in the Indian context has been studied in various regional perspectives and research continues to be carried on by scholars. T.J. Campbell's *A brief History of the ForestDepartment of Assam* (1898) and H.P. Smith and C. Purkayastha's *A short history of theAssam Forest Service 1850-1945* (1946) are early works dealing on regional prospects.Another work is that of Ramachandra Guha's*The unquiet woods: Ecological changes and Peasantresistance in the Himalayas* (1989) which is an agenda on environmental works set as a critique of colonial policies. Madhav Gadgil and R. Guha's work *This Fissured Land: The Ecological Historyof India* (1992) gives an immense theoretical importance and other information; it also contains few references on Assam. P.M Mohapatra and P.C Mohapatra's *Forest management in tribalarea: Forest policy and People's Participation* (1997) is a pioneering work outlining the steady deteriorating of the forest along with the condition of the people, mainly the tribal people, living in and around the forests and depending on the forests for their living.Rajib Handique's *British Forest Policy in Assam* (2004) examines the socio-economic and environmental impact of the British policy but even this work contains limited information of the Naga Hills District which was previously a part of colonial Assam. Gupta, Thapliyal, Pal and Joshi *Impact of Deforestation on Indian Monsoon- A GCM Sensitivity Study* (2005) published in *Journal of Indian Geophysical Union*is an addressee on the impact of deforestation over Africa, North-East India and Burma region on Indian summer monsoon circulation and rainfall.Kapesa lokho, Raju and Azmiwork on *Paleoenvironmental and Biostratigraphic Significance of Uvigerinids and other Foraminifera from the Bhuban Formation, Assam-Arakan Basin, Mizoram*(2011)

published in *Journal Geological Society of India* is a good documentation on biochronology and interpretation of the depositional environment.Nautiyal and Chauhan (2009) work on *Late Holocene vegetation and climate change in Loktak Lake region, Manipur*, based on pollen and chemical evidence published in *The Palaeobotanist* provides insights into the changing vegetation and climatic scenario in the Loktak region during the Late Holocene.Jhimli's *Changing Equation between Man and Environment in India's North East: A Sociological Analysis* (2013) published in *International Research Journal of Social Sciences* tries to look at the disruption of man- environment relationship in north eastern part of India through Marxist approach. It attempted to understand the region under British Empire which gradually led to the degradation of its ecological set up and the perpetuation of same policy in post-independence period by the independent government of India which has led to the further deterioration of the situation. Jay Anand's *Emerging institutional perspectives: A case study on managing bamboo resources for charcoal production in Nagaland, India*in *Boiling Point*(2013)is a good article that examines the use of plant genetic resources, especially bamboo, in Nagaland (North-East India), and how institutions have optimised its use through promoting the use of sub quality (flowering) bamboo for charcoal making helping to sustain local livelihoods by generating income from this otherwise wasted resources and they thus reduce carbon emissions by using the bamboo charcoal at both household and industrial level. The volume *Climate Change in Northeast India: Recent Facts and Events –Worry for Agricultural Management*(2009) by Das, Ghosh, Choudhury, Patel, Munda, Ngachan and Chowdhury gives an input of Northeastern Region of India relating to highly prone consequences to climate change because of its geo-ecological fragility, strategic location vis-à-vis the eastern Himalayan landscape and international borders, its trans-boundary river basins and its inherent socio-economic instabilities.Sajal Nag (1999) *Bamboos, Rats and Famines: Famine Relief and Perceptions of the British Paternalism in the Mizo Hills (India*),is aremarkable work on ecological phenomenon witnessed by the British when they entered the Mizo Hills followed by severe famine apparently caused by rats due to bamboo flowering. However, all these works does not mention anything in particular on the Naga Hills.

In the context of Nagaland, works on environmental studies have been of a minimal nature if not non-existent. Alemchiba Ao,*A Brief Historical Account of Nagaland* (1970) is a descriptive account of Nagaland; so also is Tajenyuba Ao's

British occupation of Naga country (1993) which is a work on the British occupation on the different tribes of the Nagas yet fails to mention anything on the history of environment in the Naga Hills.Atola L Changkiri's work on *Angami Naga and the British 1832-1947*(1999)reflects on the relationship of the Angami Naga with the British but does not deal with the environmental policies of the British. Piketo Sema's*British policy and Administration in Nagaland 1881-1947* (1991) is a good work on British policy but greatly lacks in discussion on the colonial forest policy and related issues. Pushpanjoli Deori'swork on*Environmental History of the Naga Hills 1881-1947*(2005) concentrates on the nature, risk and the control of natural resources along with the indigenous responses to the changing patterns of environment control under colonialism; understanding of the relationship of forest and the Nagas; steps undertaken by the colonial state for conservation and forest regulations. NEPED'S project, *Adding value toShifting Cultivation in Nagaland and Building upon Traditional Agriculture in Nagaland*(2006) is an overview of Agricultural systems in Nagaland. S. K. Bera, S. K. Basumatary *et al*. (2011) work on the *Late Holocene Climate and Vegetation Change in the Dzüko Valley, North East India*published in *Current Science* is a profile of the Dzüko valley that revealed the short term vegetation and climatic alterations in the region for the last 1600 years.All these works does not clearly mention on the nature of forestry and de-forestation and its impact on the Naga Hills and people in particular. Moreover, scientific validation is not incorporated which is very important to give a clear description on the changing scenario of the time.

1.3: Objectives of Study

The study focus on the authentic presentation of the Nagas both in the use of environment and its impact. The study covers such issues beginning from the colonial period to modern times.The unique traditional ownership of land and forest has been a crucial focus of the study as these has to a large degree controlled the state to implement any firm legislation.The study also makes an intensive survey on the extent of deforestation and addresses some major causes of deforestation. It also examines the reasons of the failure of Forest Acts from colonial to post-colonial in containing deforestation.Finally, an important impact on the study is to analyze the management and changing status of forestry within the assigned temporal framework,

its varied impacts, and suggest a strong recommendation for future initiative by the government and other organizations on deforestation and forest management.

1.4: Methodology and Sources

This study involves the following strategies for the collection of data:

Historical sources both archival and secondary-periodicals, reports of different Government officials, Gazetteers etc. are consulted and analyzed.

Ethno-historical accounts on the traditional practices of cultivation, fallow period, forest management, sacred groves and present agricultural practices were documented.Observations were also made on Government schemes, projects etc., introduced in the villages across Nagaland alongside its impact on deforestationboth from secondary sources and field study.

Satellite imageries have greatly expanded opportunities for data integration, analysis, modeling, and map production for environmental monitoring and assessment. As populations grow, as countries boost their economies, as landscapes change, governments have increasingly relied on up-to-date satellite imagery and other geospatial data for applications on environmental planning, land registration, disaster response, public health, agriculture,biodiversity, conservation and forestry. Therefore,satellite imageries are also taken to highlight the extent of forest cover and land-use change in the State.To delineate and identify potential sites for investigation, digital analysis has been carried out and the sites marked with the help of GPS aided technologies.

Nagaland, one of the seventh states in North-East India by virtue of its geographical position, climate conditions and altitudinal variations, is a biodiversity rich region. The people of Nagaland depend directly on land and forest for their livelihood. About 70% of the total population of Nagaland practice agriculture-*Jhum* cultivation and the rest are engaged in tertiary activities and principally, services of different types. The social structure of different Naga tribes may be analogous in certain respects, but they exhibit significant economic difference on account of various ecological factors of their terrain.The Naga history is deeply rooted with the land they live. The land is the soul of the Nagas. The area where the Nagas live is characterized by the hilly and forested environment. This style of livelihood has led

them to develop a symbiotic relationship with their environment. The environment has significantly contributed for the evolution of culture, customs, social and varied traditional practices. The Nagas occupation and their way of life are also essentially linked with the forest. However, the system has and is experiencing substantial changes with times with exogenous influences and other intervention. Prior to the British colonization of the Naga Hills, the Nagas were prudent users of nature. Forest management and absolute ownership lies with the individual and the community. There has been no forest management applied to any area. But with the coming of the British and setting up of British India Administration at Samaguting in 1866, marked a historic step in Nagaland's modern history (Chasie, 2005: 253-264). The management of the forest thereafter was done according to the Assam Forest Regulation of 1891. In course of time, the coverage of the area was extended to the whole of Nagaland which formed one Forest Division of Assam up to 1957 called the Diphu Forest Division.

The State is no longer immune to change in large scale land- use which over the years has been accelerated by anthropogenic and technological demands. The people grip on forest and forest based resources is deteriorating the natural environment. The study of late Holocene climate and vegetation in the Dzüko valley indicates that the climatic condition deteriorated and resulted in deforestation as evidenced by the loss of dwarf bamboos (dry brown patch) and burnt stumps of Rhododendron. During the recent past, the natural forest of the area is being destroyed extensively by forest fire because of human intervention. All these have resulted in the rapid depletion of the rich flora of area (Bera *et al*., 2011: 143-148). The wanton destruction or use of land for cultivation especially *jhum* cultivation, burning of jungles-a traditional practice, creation of new village, mining, logging, population growth, etc., are contributing to forest lost in Nagaland. The age-old forest based traditional practices along with the livelihood of the people has also dwindled. According to the Forest Survey Report, 2012, out of the total land area of 16, 57,583 hectares, forest occupy an area of approximately 8,62,930 hectares. Within this, 88.3% of the forest belongs to communities and individuals, and only 11.7% of the total recorded forest constitutes government forest. Henceforth, the private owners play a key role in the matters of forest and land.

Against such a back drop, it has become imperative to conduct studies on history of environment and ecology in the region under investigation covering the Districts of Mokokchung, Mon, Peren, Tuensang, Wokha and Zunheboto. This will also lead other disciplines to take into account the fast changing and growing environmental concerns while conducting any kind of research in the region. To many it may seem as a surprise that there have been concerns for environmental and ecological issues throughout human history. This is because our studies of history have focused too often on war, politics, and dynasties rather than environment, culture and development. Just as individuals are lost without their memories, civilization needs its collective memory in the form called history. Studies of the history of environment and ecology give us greater understanding of the active changes in the nature of landscapes. They provide a historical reference for examining modern patterns and process of environmental and ecological changes. By comparing histories from multiple locations, one can evaluate the cultural and natural causes of differences of changes in the characteristics of ecosystems. The modern global environmental and ecological crisis requires an understanding of history that is only recently becoming available.

End Notes

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CHAPTER2

GEOGRAPHY AND ENVIRONMENTAL BACKGROUND

Nagaland, by the 13th Amendment of the Indian Constitution attained its full-fledged status of the sixteenth state of the Union of India on 1st December, 1963. The State of Nagaland covers an area of 16,579 sq.km and lies between 25°6' and 27°4' latitude North of Equator and between longitudinal lines 93°20' and 95°15' East. The State is bounded by Manipur on the South, Assam on the North and West, Arunachal Pradesh on the North-East and also shares a common international boundary with Myanmar on the East (Statistical Handbook of Nagaland, 2012: 2).

2.1: Demography

According to 2011 Census, the population of Nagaland is 19, 80,602. Out of this, 71.03% of the population lives in rural areas. The density of the population is 119 per sq.km.The State has eleven districts namely- Dimapur, Kiphire, Kohima, Longleng, Mokokchung, Mon,Peren,Phek, Tuensang, Wokha, and Zunheboto.The population of Nagaland is almost entirely tribal. There are many separate tribes and sub-tribes amongst the Nagas with their own distinctive language and cultural patterns. The different tribes, which now constitute the Naga people, are rigidly distinct from one another. These tribes existed in complete isolation, their contacts with one another was restricted to head-hunting and frequent warfare. These tribes have their own name, which often give clue to their history (Sema, 1986: 2).

2.2: Topography

Topographically, the State is mountainous and the altitude varies approximately between 194 meters and 3,048 meters above sea level. The topography of Nagaland is similar to that of any other young mountainous terrain featuring high hills, sharp ridges, and deep narrow gorges. Barring a few square kilometers of plains along the western foothills and a few small valleys along the rivers, the entire State is covered with hill ranges. Nagaland can be sub-divided into three terrains:

i) High hill ranges in the east

ii) Medium high hill ranges in the intermediate zone

iii) Outer foothill areas in the west

Nagaland is devoid of any plateau or tableland like the adjacent areas of Arunachal Pradesh and Myanmar. In the outlying hill track on the western side, there are a number of valleys located at an average altitude of 300m. On the east of the outer foothills is the intermediate zone, which is characterized by a continuous hilly range with an altitude between 600m and 1,200m. These medium hill ranges run through the middle of the State from northeast to southwest like a spinal column. The hills gradually rise to an altitude of more than 1000m and then spread further towards east. Unlike the smaller hills in the intermediate zone, the high hill ranges, which rise to more than 3,000m, do not maintain a continuous range. The hills are marked by serrated ridges, separated from one another by deep valleys. The eastern part of Nagaland, dominated by a rugged terrain and lofty hills, remain clothed for a greater part of the year with dense forests. The Patkai Range, the highest mountain range in Nagaland, attains a height of 3,480m at Mt. Saramati, the highest peak on the extreme east. It takes a north-south course separating Nagaland from Myanmar and also acts as a watershed between the rivers of India and Myanmar. The hilly nature, rugged terrain, and lofty ranges have a great bearing on the population distribution and the human landscape of Nagaland. It is the extreme eastern part adjoining Myanmar, which is less developed and inaccessible mainly because of the constraints imposed by the comparatively formidable physical terrain (Venuh, 2005: 9-10).

2.3: Agriculture

Agriculture is the mainstay of the Naga people. Of the total Naga farmers, 70 percent have been practicing*jhum*cultivation on the steep slope with only the Angamis and Chakhesang tribes practicing Terrace Rice Cultivation (TRC) on steep slopes. Some of the major crops cultivated in Nagaland are paddy, maize, millet, *kholar*, Naga *dal*, soyabean and other varieties of vegetables. The food security of a farmer depends entirely on the land cultivated and the level of soil fertility. However, population pressure with decadal growth rate 64 percent (Census of India, 2011, Nagaland) is alarming and may lead to scarcity of land impacting food security. The topography of the hilly terrains poses barrier in utilizing land for large scale farming.

2.4: Flora and Fauna

The flora of the Naga Hills closely resembles that of Sikkim up to the altitude below 2,000 feet. The slopes from 2,000 feet to about 5,000 feet are chiefly under rice cultivation. The terrain is predominantly hilly and is covered by a rich and varied flora and fauna assemblage. It forms part of one of the 25 biodiversity hot spots of the world, i.e., the Indo-Burma Biodiversity Hotspots. From 5,000 feet to about 8,000 feet, the vegetation is composed, for the most part, of plants belonging to various genera, which are detailed in Appendix-1. The hills inhabited by the Nagas have received floristic elements from India, China, Malaya and Myanmar. There are 16 genera and some 63 species of bamboo in Northeast India which ranks as a centre of genetic diversity for four major genera: *Arudinaria, Bambusa, Cephals otachyum* and *Dendrocalamus*. Compared to other northeast states, however, diversity in Naga areas is relatively low, possibly as a result of extensive slash-and-burn cultivation (Stirn and Ham, 2003:19). Other striking feature of flora of the land include "trees so tall that shots of 12 bore guns cannot kill pigeon perched on their tops…,(small) bamboo species…which entwine themselves up hundreds of feet to the tops of tall trees…, and some bamboos so big that several strong men are required to lift a single piece"(Lasuh *et al*.,2002: 18). As regards the fauna of the Naga Hills, it constitutes a meeting ground of the sub-Himalayan, Indian, Chinese and Burmese types. A major part of Nagaland is covered by forest and jungles where plenty of birds, and animals and reptiles are found. However, in the wake of modern civilization, which has brought guns to the people after the Second World War, indiscriminate killing of animals and birds have depleted greatly the number of wild animals and birds. Some of Major Godwin-Austen collected list of birds, in 1870-73, are listed in Appendix-2. Some animals of Nagaland are also detailed in Appendix-3.A wild life census taken in April 1978 revealed variety of animals and birds- 141 Elephants, 67 Gaurs, 50 Sambars, 128 Barking Deer, 2 Leopards, 1 Royal Bengal Tiger, 11 Sloth Bears, 125 Rhesus Monkeys, 42 Wild Dogs, 14 Foxes, 16 Wild Bear, 44 Porcupines, 16 Otters and 7 Himalayan Hornbills[1].

2.5: Climate

Nagaland enjoys a climate ranging from tropical to temperate. The climate over the foothills is warm sub-tropical, while on the high hills is cool and temperate. The mid-slopes and lower ranges of the western flank have a moderate sub-montane climate. The summer and winter temperatures over the hills, vary from 5°C to 25°C and those over the foothills have a range between 12°C to 32°C. Over the hills temperature is cool during winter and occurrence of frost over large tracts is observed but snowfall is rare in the inhabited areas. January is the coldest month of the year. Winter winds are generally weak and variable. Monsoon lasts from May to September and the annual rainfall varies from 1000 to 3000 mm. Due to prolonged rains and high humid conditions, the natural vegetation over lower ranges of the western flank is characterized by sub-tropical evergreen rainforests. The centrally hilly region has broad-leaved temperate evergreen rainforests. The eastern and south-eastern plateau has characteristic coniferous vegetation (Soil Survey Report, 1975: 1-2).

2.6: Geology

Nagaland forms a part of the northern extension of the Indo-Myanmar Range (IMR)that links the Arunachal Himalaya on the north to the Andaman and Nicobar Islands in the south. This region is representative of some Cretaceous-Tertiary orogenic upheavals that form a fairly young and mobile belt of the earth. The stratigraphic framework of Nagaland are modified after Mathur and Evans (1964), Directorate of Geology & Mining (1978). The Naga Hills, in general, are said to be composed of tertiary rocks overlaid by tertiary strata. In 1883, Oldham described the hills, for about 20 miles north of Mao and east of Kohima, as axial, while to the west of Kohima by a tract of tertiary country, with dune or gravel deposits immediately to the south and east of Nichuguard[2].

The geological history of Naga Hills relate to the oblique subduction and subsequent collision between India and Central-Eastern Burmese (Myanmar) continental blocks during Late Cretaceous-Eocene period. A linear arcuate deep basin developed along the leading edge of the subducting Indian Plate in which Disang sediments were deposited. The Disang Group of rocks represents the accretionary prism and the associated sediments deposited at the subduction end in the east. The

Myanmar (Burmese) volcanic and the Ophiolite belt seem to have supplied the source material (Pandey, 2005: 22).

Based on Morph tectonic elements, the Naga Hills has been longitudinally divided from west to east into three distinct units namely the Belt of Schuppen, the Inner Fold Belt and the Ophiolite Belt. The Schuppen belt has been defined as a narrow linear belt of imbricate thrust slices which follows the boundary of the Assam valley alluvium for a distance of 350 km along the flanks of the Naga-Patkai Hill ranges. The Inner Fold Belt occupies the Central part of the Naga Hills and extends upto the Pangsu Pass in Arunachal Pradesh. The NE-SW trending Ophiolite belt of the Naga Hills extends along the Eastern margin of Nagaland State for nearly 200km boarding Myanmar (Sebu, 2013: 26).

2.7: Types of Forest in Nagaland

Though Nagaland is a small State, it has been endowed with a wide variety of Forest Types on account of its unique geographic location and wide range of physiographic terrain. The following forest types are found in the State (Annual Administrative Report: Department of Forest, Ecology, Environment and wildlife, 2013: 15-16):

i) *Northern Tropical Wet Evergreen Forest*

These forests once covered the Namsa – Tizit area but now only a small vestige is found in the Zankam area. It is found only in Mon District. The dominant species in this type of forest are Hollong (*Dipterocarpusmacrocarpus*), Maki (*Shoreaassamica*), Nahor (*Mesuaferrea*) etc.

ii) *Northern Tropical Semi Evergreen Forest*

These types of forests are found in the foothills of Assam-Nagaland border in Mokokchung, Wokha and Kohima Districts. The species that make up these forests are similar to those of the Northern Tropical Wet Evergreen Forests. The only difference is that in the former case the evergreen species dominate though there are deciduous species like Bhelu (*Tetrameles nudiflora*), Paroli (*Stereospermum chelonoides*), Jutuli (*Altingia excels*) etc, whereas in the present case, the number of evergreen species decreases and the deciduous species are more in number.

iii) *Northern Sub-Tropical Broad Leaved Wet Hill Forest*

These types of forests are found in the hill areas below 1800m and above 500m in all the districts of Nagaland. The wet evergreen species are conspicuous by their absence and the dominant species are mostly semi-deciduous. Some of the important timber species in this type are – Koroi, Pomas, Sopas, Gamari, Gogra, Hollock, Sam, Aam, Badam, Betula etc.

iv) *Northern Sub-Tropical Pine Forest*

These types of forests are found in hills with elevation of 1000m to 1500m in parts of Phek and Tuensang Districts of Nagaland. Pine is the dominant species, and is found mixed with Quercus, Schima, Prunus, Betula and Rhododendron.

v) *Alpine Forest*

Alpine vegetation is found at high altitudes in ridges of Saramati range, which remains covered with snow for major part of the year from October to April. After melting of the snow during the brief summer, a few annual, herbs and shrubs along with mosses can be seen growing. Species of Rhododendron, Abies and Junioerus are found in Sub-Alpine area. Sub-Alpine vegetation gradually merges into alpine vegetation which comprises of high altitude grasses and dwarf Rhododendrons. Many members of Primulaceae, Saxifragaceae, and Polygonaceae families are also found.The tree cover or forest cover of the State is estimated at 322 sq.km. which is 1.94% of the State's geographical area.

Out of the State's geographical area of 16, 579 sq.km, forests occupy an area of approximately 8629 Sq.Km. i.e., 52.04%. The Table 2.1 details the distribution:

Table 2. 1: Status of Forest in Nagaland as on 31.01.2013

Legal Status	**Forest Area (sq.km)**	**% of Total Forest area**	**% of Total Geographical Area**
a) Government owned Forests:			
1. Reserved Forests	62.26	0.72 %	0.72%
2. Purchased Forests	192.47	2.20%	2.20%
3. Protected Forests	34.69	0.40%	0.40%

4. Wildlife Sanctuary	202.02	2.31%	2.31%
b) Government controlled (private owned) Forests : 1. Protected Forest	516.79	5.98%	3.1171%
c) Village Owned Forest 1) Virgin Forest 2) Degraded Forest	4778.27 2842.80	55.40 32.90%	28.8212% 17.1467%
Total (a+ b+ c)	8629.30	100.00%	52.0442%
d) Ownership: a) State Government b) Private/community	 1008.23 7621.07	 11.70% 88.30%	 6.00% 46.00%
Total	8629.30	100.00%	52.00%

(Source: Annual Administrative Report, 2012-2013)

Table 2.2: Area under different land use in Nagaland

Classification	**Area in (sq.km)**
Forest	8629.30
Land under Agricultural use	278.62
Land under miscellaneous tree crops and groove	1242.52
Cultivable wasteland	725.34
Cultivable non-forest area (CNFA)	3214.00
Net area sown	1867.00
Area sown more than once	360.00

(Source: Annual Administrative Report, 2012-2013)

Table 2.3: Density Wise Forest Cover (in sq. kms.)

1	Very Dense Forest (70% & above)	1293
2	Moderately Dense Forest (40%- 70%)	4931
3	Open Forest (10%- 40%)	7094

(Source: Annual Administrative Report, 2012-2013)

End Notes

1. *Glimpse of Nagaland*. (1978). Kohima: Directorate of Public Relations.
2. Geological Survey of India. (1960). Vol. XIX, pp. 218-224

CHAPTER 3

GENERAL VIEW OF THE SOCIAL STRUCTURE OF THE NAGAS

The Nagas are an Indo-Mongoloid folk, living in the north-eastern hills of India, divided into over a dozen of major tribes, speaking languages and dialects more than double the number of tribes. The Nagas also appear in general to be distinguished from their neighbours by physical conformation; for though there is much difference in this respect amongst them, yet they are in common remarkable for extremely coarse, savage countenances and dull, timid, heavy disposition (Ao, 1970: 25).

3.1: Socio-Cultural Practices

In the primitive society, the family, clan, phratry and totem are a unit of social organization (Sharma, 2010: 153). Likewise in Naga society, the basic interest of every Naga is in his family, the clan, the *khel* and the village. Naga social organization is made up of cross-cutting group ties. By being members of a larger functional units – family, lineages, clans, age groups, classes, *morungs* and villages, the individual and the household are in very few senses autonomous but are integrated into the society (Jacobs, 1990: 53).

Nagas as a tribe had never been under one head. A tribal spirit prevailed in each segment. But for the purposes of war and defense, leagues of villages were formed (Philip, 1983: 30). Mills (1926) while talking about the Aos, has said that the whole tribe has never been united under one head, and fought with each other, yet a tribal feeling does exist. Even in the old head-hunting days, loosely knit leagues gave the tribe a certain amount of political cohesion. For all Nagas the real political unit of the tribe is the village (Mills, 1926: 176). Among the Aos, the largest unit is the village and that is bound together by social, political and religious ties. The village acts as a unit in all things. An individual is for the village and the village is for the individual. Among the Angamis, the village may be regarded as a unit of the political

and religious sides of Angami life, the real unit of the social side is the clan. The clan almost forms a village in itself, often fortified within the village inside in its boundaries. Even during wars, though the villages were united, the jealousy and suspicion among the clans would inevitably be a source of weakness (Hutton, 1921a: 109). The Semas can only be said to have a tribal organization in so far as the villages which they inhabit are organized on a pattern generally prevalent throughout the tribe. The basis of Sema society is the village which is under the control of the chief. It is not to say that the clan is never important to Semas, clan feeling exist as does tribal feeling but it has no organs. (Hutton, 1921b: 121). The Konyaks speak of the clan as a pyramid of 'houses'. All the small houses (junior lineages) recognize descent from the great house (the senior lineage which represents the clan). Together, all the clans houses are responsible for the debts, fines, obligations and proper behavior of their members. The individual is born into a lineage, clan, *morung*, class and village. The importance of any of these particular groupings varies from one Naga community to another. Diverse types of groups exist but still Nagas are of one society, an aggregate of community who share a set of structure or principles in common, but emphasize them differently (Jacobs, 1990: 56 & 64).

Naga society is a patriarchal society in which the father is the head of the family and all the decisions are made by him, but when necessary wife is consulted. Children are expected to help with basic household and agricultural task. By the age between 6 and 12, in communities where the *morung* is an important institution, the children will stop sleeping in their parents' house and will start to sleep in the *morung*, learning the skills of responsibilities of adults (ibid.: 56). *Morung* is a dormitory for unmarried men. Nagas built the village dormitory or bachelor's hall like that of the aboriginal tribes of Chota Nagpur and Madhya Pradesh in India and of the tribes of Melanesia and Polynesia (Majumdar, 1958: 259). The *morung* was one of the most important social institutions of Naga life. Most of the Naga tribes, except a few like Angamis and Semas have this good institution. Angamis use such houses on ceremonial occasions and observance of days of prohibition. For the Semas, the village chief's house served both as *a morung* and a place for ceremonies (Philip, 1983: 31). After the coming of Christianity and western education the importance of this institution considerably reduced.

At death, bodies are treated in diverse ways. The Angamis bury their corpses as well as the Lothas. The Konyaks practiced platform exposure of the corpse, removing the head first which is placed in a pot. It is then fed over the subsequent years, particularly at times of agricultural festivals. After the next harvest the skull, which is painted with a geometrical design is turned to face outwards. This was because there were often some rituals which links the death with the harvest (Jacobs, 1990: 61-64). The Semas also bury their dead. Graves, as a rule, were just dug outside the dead man's house which was not more than three feet deep. In some villages a small thatched roof was put up over the graves (Elwin, 1969: 374). The Aos do not bury their dead. A corpse was place in a structure of bamboo and thatch, somewhat like a house, just big enough to fit the body and then put up to be smoked in the outer compartment of the house ten days to two months. After which the dead man's cloths which was laid over the structure was taken out and placed it on a bamboo platform in the village cemetery (ibid.: 328).

3.2: Customary Law (Law and Justice)

Law is conceived as rules or modes of conduct made obligatory by some sanctions which is imposed or enforced for their isolation by a controlling authority from man's feelings or sense of right (Pospisal, 1971). Vinogradoff (1974) defines it as "a set of rules imposed or enforced by society with regard to the attribution and exercise of power over things" (cited in Vitso, 2003: 1-2). Law contributes towards social order in human life by dealing disputes before it leads to continuing social disorder. Thus law can be seen as a means of social control which is found in existence in both the simple and complex society and customs is the major source of law and it regulates human behavior in early society when written source of laws were not in existence. The origin of custom lies when a particular habits is adopted by a group of people, it becomes a custom of that community. Custom is not law and is not imposed by state but when customs are recognized and accepted then they attain the status of law (op cit.: 2).

Customary law exists where there is no written law. Naga customary law is unwritten law which varies from tribe to tribe and village to village. The Nagas have their traditional religious practices, social codes and legal institutions based on myths and legends which are transmitted from generation to generation through oral

tradition like narration, folk tales, folklores and folk songs. The existence of tribal customary law is as old as the tribe itself, and thus tribal customary law can be a part of the study of tribal society (ibid.:5). Many British ethnographer and administrators such as Mills *The Lotha Nagas* (1922); *The Ao Nagas* (1926) and *The Rengma Nagas* (1937); Hutton *The Angami Nagas*(1921a) and *The Sema Nagas*(1921b) and Elwin *The Nagas in theNineteenth Century* (1969) published reports of some British administrator which they recorded through personal observation and firsthand accounts, have discussed on the Naga traditional cultural life of the people and described the importance and influence of their customary law on the life of the people. Through their writings it can be seen that traditional customs and laws were important in regulating the life of the people. There are no written records on how this law has been practiced but this has been orally handed down from generation to generation which serves as the general sanction for the observance of traditional norms.

Customary law is the highest authority in Naga society. There is no authority and power above the customary law. In the village, the chief and his councilors are the custodians of customary law. Every individual is bound by this law. It is the custom that designs the behavior of an individual in the society and anyone forbidding the law is punished as according to the law. Naga society is a patriarchal society, and as according to the customary law,descent and inheritance are generally along the male line. The law of inheritance is almost same among all the Nagas. The property of the father is divided equally among the sons (in case of more than one son) during the father's life time. When a son marries, he receives his portion of inheritance from the father. The youngest son usually inherits the parental house. According to the Angami tradition as stated by Hutton (1921a), the property of any son dying without male children during his father's lifetime reverts the property to his father, later (after the father's death) it goes to the youngest son, who either keep it or share with his other brothers (Hutton, 1921a: 136). The wealth of the domestic unit is affected by the customary law of inheritance in each tribe. Generally in practice, each brother receives a similar amount in property from the father, but the Angamis leave most of the property to the youngest son, while some group of Konyaks prefer to leave all the property to the eldest (Jacobs, 1990: 61). Property other than land is not subject to customary restriction except in so far as weapons and ornaments by men always go to

male heirs. Movable property can be inherited by sons and daughters, and no fixed rules (ibid.: 61; also see Hutton, 1921a:141-143). The Naga males inherit all property, and they also inherit the father's debts as well (Hutton 1921b: 160).

It is common in all the Naga villages that disputes within the village are settled by the elders of the village. The guilty pay their fines in terms of pigs or cows. But Semas according to Hutton (1921b) disputes apart from being settled by chief and the village elders, the Semas being usually ready to agree to any reasonable compromise, at times if it is a dispute to a private right, the matter would be probably settled by a compromise (Hutton, 1921b: 163). Disputes with other villages are settled by meeting of the elders from the respective villages. At times, disputes are settled by oaths. In deciding disputes, decision is referred to the elders of the village and as a custom, it is regarded as final but sometimes the custom are defied and the question of fact are usually decided by oath. The accused family member or the relatives of the Angamis usually are not willing to accept the oath unless they are satisfied that the statement is true, as false oath would entail death or at least misfortune (Hutton, 1921a: 144). The oath is less resort among the Semas than by many other Naga tribes, because when an oath is suggested, neither the party will abide by the oath of the other. Thus, at any rate the Semas will not take oath recklessly or indiscriminately (Hutton, 1921b: 164).

3.3: Marriage

The Nagas follow a very strict tradition and customs when it comes to marriage and divorce. Marriage between the same clan is prohibited. Marriages, among the Nagas were mostly exogamous. Customs ordained what could intermarry. A boy and a girl of a same clan are brother and sister and are not allowed to marry. According to Hutton (1921b), a Sema man would be guilty of incest and banished from the village, if he marries a woman who is his third cousin in patrilineal descent but can marry any female relation of his own mother on her father's side (Hutton, 1921b: 131-132). Young women marry between 15 to 20 and young men between 20 to 25. Bride - price was not uncommon among the Nagas. It is customary among some Naga tribes, the man pays a bride – price and in return he receives gifts, this gift exchange between the two groups continues. Marriage payments involve exchange of material and ceremonial value. The Semas pay the pride price and at times the parents of the girl will try to secure the highest possible bride-price, and will insist on marrying their

daughter within the chiefly clans. Among the Rengmas, the groom's family presents a spearhead to the bride's family as a symbol of tribute between the families (a gift of a spear is a universal Naga symbol of tribute between groups). In case of Lotha bride-price, there are eleven exchanges, each meaning something quite different (Jacobs, 1990: 57-61). Davis in his report on the Lothas in 1891, Census of India 1891, Vol. I states that custom allowed polygamy but was practiced only by the rich. Girls were, as a rule, married off at a young, by 13 or 14 years of age and the pride price were usually about Rs.100. Owing to early marriage, divorce were also very common and widows were allowed to remarry (Elwin, 1969: 351). Davis in Census of India, 1891, Vol. I, notes that the *khels* among the Angamis are exogamous sub-division and so a man is obliged to look for his wife of a *khel* different from his own. For the Angamis, on the day of the marriage, the father of the groom sends some pigs (numbers varies as according to the wealth), salt and some liquor (rice beer) to the bride's parents, by which a feast is given to the bride's friends and the *khel* men (ibid.: 305-306). Davis report shows, though he did not use the word 'bride price', sending materials for the feast clearly shows that the groom's family gave something to the bride's family. Like other Naga tribes, the Aos are very strict about enforcing the rules of exogamous marriages. Polygamy is not practiced by the Aos, as well as the Angamis. Marriages among the Aos were taken place without any ceremony, but there was a custom at times which may be called; the parents of the bride had to give rice to the new home, failure to make such provision was a disgrace. The bride also takes some quantity of firewood to the new house for cooking the first meal (Smith, 1925: 55).

Since Nagas follows a patriarchal system, women do not inherit family ancestral land, either agricultural land or homestead. However, women are taken care by the father, brothers or husband. Naga women never complain about the lack of land security, for an unmarried daughter(s) is often taken care by the brother(s) when their parents are dead. At the time of marriage the parents often give certain gifts to their daughters like paddy, buffalo and cow (Shimray, 2007: 48).

3.4: Status of Land in a Naga life

The land is the most important asset of the Nagas. The Nagas have their own way of understanding the use of land which is manifested through their livelihood. Even their historical roots are strongly embedded with their land. It is the basis of their economy,

culture and belief. For a Naga, land is an indispensable asset. There is no land in a village without an owner and there is village without some land for certain use (Deori, 2005:52). The Nagas has a unique ownership of land. The problem of fragmentation of land is not prominent due to peculiar pattern of land ownership, tenure and use. The number of landless farmers and landless agricultural labourers is negligible. There are no laws or regulations governing ownership of land in the State. The only legal framework for determining the right to cultivate land is the *JhumlandRegulations Act of 1970*. The use of the land underlies all other aspects of Naga society. That is to say, not only must the land be worked to produce basic subsistence food for the people, but the ladder of social prestige can only be climbed by individual accumulating sufficient surplus to afford the lavish sacrifices and feasts involved (Jacobs, 1990: 33). The Nagas primarily depend on agriculture. Festivals and religious ceremonies were arranged around the agricultural cycle of the year. Each agricultural stage was preceded and followed by rituals and ceremonies performed either by individual household or by the community. Among the private ceremonies, the most important was the Feast of Merit. During the feast of merit, the whole community participates but it was the host who bears all the expenses of providing food and drinks to whole village, an opportunity is given to the community to share the material wealth of the individual who was hosting the feast. In return, it increased the social status and influence of the host in the society. In the public ceremonies and festivals, the most important are the sowing and harvesting ceremonies and the accompanying festive celebration (Venuh, 2004: 51-52).

The ownership of land and the individuals' right to use it, is almost exclusively determined by tradition and what is loosely referred to as "customary laws" which are uncondified, and yet very effectively applied, and in the event of any dispute, are propounded and interpreted by the traditional village Councils. Though the entire tribal population uses the generic name "Naga", there are a number of individual tribes with different traditions and customs, in regard to ownership and inheritance of property including landed property. Notwithstanding these diversities, certain broad patterns are summarized:

Except in Sema and Konyak areas, the land is owned either by the village community as a whole or by a clan within the village or by individuals. There are no

records for conferring such ownership rights but usually determined by tradition and Customary Laws. The Village Councils are the authority for directing community actions on land and interpretation of customary laws in regard to the ownership or use of land by individuals. However, in the areas where terrace cultivation is practiced or introduced, individual ownership is getting established gradually. Usually there are no intermediary tenancies or sub-tenancies in Nagaland.

Angamis and Chakhesangs, who mostly practice terrace cultivation, have individual ownership system of land. Every individual owns landed property and enjoys every right over it. The right is permanent, heritable and transferable; ownership of land is either by inheritance or by purchase. There are a few cases where the property is held jointly by a clan. In such cases, the village decides by whom the land should be cultivated and generally the land is entrusted to the eldest of the clan or the poorest. Such landed property cannot be sold out by individuals. Land can be transferred by sale. In case, a person dies without issue, automatically all his property goes to his nearest relatives. In case of sale, the near relatives must be first informed, if they like to purchase the land and if they refuse, the land is sold to one offering the highest price, but usually the land on sale is purchased by the relatives. Hutton (1921a) points out that, terraced fields, wood plantations, gardens, building sites and the greater part of *jhum* land is individual property and subject to life interests, mortgages etc., may be sold or otherwise disposed at the will of the owner, though when selling an ancestral field the vendor retains a small fragment in nominal ownership lest he die or suffer misfortune (Hutton, 1921a: 140). Property other than land is not subject to customary restriction except in so far as weapons and ornaments worn by men always goes to male heirs (ibid.: 142). The ownership system of land among the Ao tribe is broadly based on two distinct systems. Generally, land is owned by the village community. Sometimes the cultivable land is also owned by the clans and individuals, while the forest land is owned by the entire village. Landed property of four kinds is found among the Aos- private land, clan land, morung land and common village land. When a village is founded, each clan took a portion of land and held it as a common clan land. The tendency has been for this to become private property; men cultivating a particular piece would acquire a prescriptive right in it; or a clan would transfer to the aggrieved party a piece of land as a fine inflicted on one of their members. Should a man die leaving no heirs, his land becomes clan land, but

probably only for a month or two, till the oldest man of the clan divides it up and it becomes private property again (Mills, 1926: 111).

Among Lothas, land is broadly owned by the village, a morung, a clan or an individual. The land close to a village is usually waste land and common property. A large portion of land in the Lotha community is clan land, which is held in common by all members of that particular clan in the village. A man who leaves a village loses all right to clan land in the village (Mills, 1922: 97). Property is inherited exclusively by the male heirs, failing, son or grandsons, brother's son; first cousins in the male line inherit in that order. A widow inherits nothing in her own right. Amongst the Konyaks, however the village chief, locally known as Ang, owns the entire land in the village. He distributes the land amongst the fellow villagers for cultivation. These rights also are said to pass by inheritance on the basis of blood relationship. The ownership right vests with the village chief or the Gaon-Burah amongst the Sema tribes as well. The actual cultivator of the land however, has a perpetual right of cultivation and that right is passed down by inheritance.

3.5: Status of Forest in a Naga Life

A Naga customs, myths, traditions and social revolves around the forests. To the Nagas, nature is the only master; the forest offers countless ways of getting food and his choice of what work to do each day, everyman is his own boss. Forest provides a wide choice for an independent spirited Naga to wander in forest; fishing hunting and gathering. This indicates that the first major area of dependence on forest is food. It takes the form of shifting cultivation, fruits and flowers from trees and plants, animals and other livestock. Nagas depended on other forest produce for medicines fodder, house building and implements (Deori, 2005: 19-20). Forest is also a source of their monetary income. The Nagas occasionally frequent the markets at Nagura and Kacharihath, and other spots along the borders where they barter their cotton and ginger for a few minor articles (Robinson, 1841:244). Moffatt Mills also reports,

"The Nagas have lately manifested a great desire to trade, and I would give encouragement to it by establishing a hat (market) at Deemapur "(Mills, 1854: cxii-iii). Jenkins, referring to the same period says, "With our people on the plains, they are almost invariably on good and friendly terms, carrying on a large barter of hill products which is to them indispensible, the western Nagas bring down large

quantities of cotton and chilies, ginger and yams, the eastern Nagas, salt to be bartered against rice, duck" (ibid.).

Forest was essentially the economic life of the Nagas. The Naga houses were entirely built with the forest wealth; the thatch, timber, bamboo, creeper etc., are all extracted from the forest. Forest provides the timber for multifarious use. The tree trunks serve as poles, pillars, batterns and crossbeams for house construction. Human beings, tigers, elephants, hornbills, pythons and mithuns' heads are carved out on the pillars and are adorned in high relief. In Konyak morungs, there are a number of erotic motifs, such as, representation of men and women and even dogs engaged in intercourse; dancing couples placing their hands on each other's thighs and other sort of carvings concerned with embrace. Wooden gongs or the log drums, which are used for celebrating victory and the taking of heads, the village feasts, for funerals of great men and at the time of eclipses of the sun or the moon and so forth are dug-out from great trees from the forest. Besides, variety of articles such as utensils, rice pounding table, smoking pipes and musical instruments are made of wood. Several patterns of *dao* carriers are also made of wood. The rice- pounding table which is indispensable in the life of a Naga is hewn from the trunk of a huge tree and has to be carried to the village by the owner's kinsmen and friends who go in a mass to fetch it. The Aos use a round section of a tree trunk with a large single hole and three low legs to pound bamboo-shoots. While the Angamis liquor vat is made from a hollowed section of a tree with three legs hewn in one block (Ao, 1967:70-71).

The agricultural implements of the Nagas are also made of bamboos and wood from the forest. A list of implements used by almost all the tribes engaged in agriculture are - a short handled hoe, a *dao* or bill hook, a bamboo rake, a wooden pestle and mortar, a wooden mallet to break up the clods, a sickle, a bamboo flail and an axe (Allen,1905:46). Nagas make baskets and mats of split bamboo. Ao (1967) remarked a Naga starts life in a cradle of bamboo and ends in a cradle of bamboo: "With a grove of bamboo I am a rich man"-remarked by an old man of Khari village. He says, "I construct my house with bamboo, use bamboo utensils and equipments in the bamboo house, burn dried bamboo as fuel, use bamboo torches and eat bamboo pickles". This statement illustrates how deep his attachment to this plant bamboo (*Gremineane*) is (ibid.: 71-71). The Angamis and Semas Nagas use a hoe made of simple piece of bamboo bent into a small hoop, and the blade being formed by cutting

away half the thickness of the bamboo, while the Aos, Lothas and some Konyaks use one of exactly similar designs but with an iron-blade. The iron blade hoe is subsequent to the wooden hoe.

3.6: Supernatural Connotation of the Forest

The tribal religion vari**es** as much as tribal or tribal laws do and to quote Mills (1926), 'Naga religion is not a moral code. It is a system of ceremonies' (Mills, 1926:215). This is substantiated by Philip (1983) who maintains that Nagas worship supernatural, they fear supernatural powers. However, Naga religion appears very simple and has no deep rooted philosophy in it. Its faith and practices do not demand a spiritual or mystical union with higher power (Philip, 1983:37).

Before the coming of Christianity, the Nagas had no established form of religion. Robinson (1841) stated that "the Nagas have no established form of worship; they have no temples erected in honor of their deities and no ministers peculiarly consecrated to their service. They have the knowledge, however of several superstitious ceremonies and practices handed down to them by traditions; and to these they have recourse with a childish credulity, when aroused by any emergence from their usual insensibility and excited to acknowledge the power and to implore the protection of superior beings". The Naga concept of religion was purely based on deities and spirits, though they believe that there is a supreme God, who is omnipresent and cosmogony is through Him (Nshoga, 2009: 218).

Most Naga tribes believe in the existence of the creator who is a benevolent spirit and the existence of creation was ascribed to be the work of the creator. The Naga world was once full of spirits. Every tree, shrub, hillock, every body of water harboured a spirit or demon. Spirits were seen to cause all natural phenomena-thunder storms, rain, wind, illness. Captain Bulter records a case of an Angami chief who lost his son by an accident when serow hunting. When the news was brought to him, he seized a shield and spear and leaped forth wrathfully challenging whatever spirits has caused his son's death (Hutton, 1921a: 178). Man was considered an integral part of the animated nature. However, because endowed with reason, he is the sole creature capable of entering the supernatural world. Out of prudence and respect for nature, man does not take undue advantage of his position, aware that in due course this would turn against him. The shaman's function appeasing of spirits and the use of his

knowledge of the invisible world to make amends to them, thus redressing the natural balance. Man does not view himself as standing outside nature but as dependent on it. Any natural disasters or illness provides ample and painful evidence to this. A sacrifice- animal slaughter, erection of stone, the giving of merit, or observance of a taboo period helps man of his dependence on nature (Stirn, 2003: 20). Hutton, in November 1918, observed that during the influenza epidemic, paths round Angami villages were littered with odds and ends of clothing and ornaments, eggs laid in the path, while many chickens freed and driven away in the jungle to serve as a substitute for the person turning them out or perhaps merely as an offering for the spirits of the jungle (Hutton, *op. cit*.: 179). These kinds of acts induce or create a psychological climate suitable for change (Stirn, *op. cit*.: 20).

Naga religion is described by sociologists to be animistic, which lays emphasis on the existence of the defied manifestations of nature and propitiation of spirits both benevolent and malevolent. The cause of troubles and torments which befall the family and the inhabitation are attributed to the action of the evil spirits. They hold that commitments, omissions and occasional failures to appease them are the reasons for incurring the spirits' displeasure. By divination they trace such sufferings, ailments and ill-luck to the influence of the evil spirits, and the spirits having been traced, appeasement to them follows. The Nagas also follow theistic principles, although on the nature, attributes and functions of the Supreme Being. Tribal religion being a mixture of theism, animism, supernaturalism and superstition is connected with the practice of sorcery, exorcism and magic. Priests receive special training of warding off evil spirits and for the conduct of ceremonies. Several practices are held to avert epidemics, believed to be a representation of an evil spirit's shadow, which in case of failures of being appeased, has come to ravage the village. A sacrificial offering in such situations consist of eggs laid in the path wrapped in a leaf, while the village paths are strewn with pieces of ornamental decorations and clothing's. Invocations to such a spirit are made to ward him off. The system of invocation and appeasement of the defied spirits varies from village to village and from one household to another. Sacrifices are also offered with a cooked liver, entrails and slices of meat and on addition to eggs (*op cit*.: 61-62).Nagas are primarily dependent on agriculture. All festivals and religious ceremonies are arranged around the agricultural cycle of the year. Almost all the ritual and *genna* that were carried out by

the people were based on agricultural season. Festivals, feasts, marriages were done in accordance with agricultural season. (Vitso, 2003: 31).J.P. Mills, in, The Ao Nagas, stated that ‘Naga religion is not a moral code. It is a system of ceremonies’ (1926: 215).

CHAPTER4

TRADITIONAL METHOD OF FOREST CONSERVATION

4.1: Sacred Groves

Nature worship is an age-old practice followed by a number of indigenous communities in India and elsewhere in the world. One such significant tradition of nature worship is that of providing protection to patches of forests (Barik *et al*., 2006: 1). Sacred groves are the remnants of relict virgin forest vegetation of the area, which is often very much different from the vegetation of the surrounding area. They not only serve as repository of the flora and fauna of the region, but play several important roles in the life of people living in the area. Besides providing large number of tangible and intangible benefits of the people in their day-to-day life, these are the places of socio-cultural activities of the people residing in the nearby area (ibid.: 4). Traditional societies all over the world value a large number of plant species from the wild for a variety of reasons, be it food, fiber, shelter or medicine. Arising partly out of this close human- forest linkage and partly because of animistic belief system of the forest dwelling traditional societies, the protected area of the natural ecosystem in a given region has existed as sacred forest in many societies all over the world (Hughes and Chandran,1998:869-876).

Man is an integral part of nature. Any impact on nature, therefore, has influence on man. Nature flourishes, man flourishes too. If nature gets destroyed, man is bound to be destroyed. Sacred groves represent the major effort to recognize and conserve ethnic biodiversity in traditional ways. Our fundamental socio-cultural, ethical, aesthetic and economic values are directly and indirectly linked with nature and its biological resources. Throughout the history of agriculture, Indian farmers have been increasing the level of biodiversity in agro-ecosystems. Diversity in genes, species and ecosystem has contributed immensely to the productivity of agriculture. The existence of sacred groves in India most likely dates back to an ancient pre-agrarian hunter-gathering era, and their presence has been documented since the early 1800s. Believing trees to be the abode of gods and ancestral spirits, many

communities set aside sanctified areas of forest and established rules and customs to ensure their protection. These rules varied from grove to grove but often prohibited the felling of trees, the collection of any material from the forest floor, and the killing of animals. Presiding deities administered punishment, often death, to individuals who violated the rules, and sometimes to the entire community in the form of disease or crop failure. As a result of these protective restrictions, preserved over countless years, sacred groves are now important reservoirs of biodiversity (Anubhav *et al.,* 1992: 2). Traditional ethos is reflected in a variety of practices including sacred groves and sacred landscapes (see Deb *et al.*, 1997; Pandey 1996, 1998). In many groves, villagers perform annual rituals and ceremonies to appease the presiding deity and ensure the well-being of the community. It is also common for people to make individual offerings, often in the form of terracotta figures, in exchange for wishes such as good health or harvest or the birth of a child. Sacred groves help to define the cultural identity of the communities that revere and protect them. They are also closely linked to the politics and economies of their communities, and their legal status and management vary among regions and individual villages.

The historical links of sacred groves have been traced to the primitive state of human society. The first instances of Indian traditional conservation of our biological wealth in various pockets of natural forest are often referred to "sacred groves". In the past, sacred groves were indicators of the phenomenon of ethno-environmental management. Sacred groves are forests that have been protected for ages by traditional societies. In the past, these were present in numerous parts of the world, nearly every continent, and wereentities held sacred by communities with different religions and different forms ofeconomic and social organizations.The sacred groves also exist in Ghana, Syria, Nigeria, Turkey and Japan. Most of the world's sacred groves, unfortunately, have disappeared and only few are reported to occur to date.And yet, some groves have passed down generations and are flourishing in their full form. The hills ofthe north eastern region (NER) of India are the living testimony of the same. These groves are relatively undisturbed (see Sherring, 1974; Rao and Nayudu, 1979; Ramesh and Pascal, 1997; Ramakrishnan, 1998, 2001; Sinha and Maikhuri, 1998).

In North-East India, there are a large number of sacred groves in the States of Meghalaya, Manipur and Karbi-Anglongarea of Assam. These sacred groves were in existence in the region since time immemorial and are considered to be the relic of the original forest vegetation of the region. These are among the few least disturbed forest patches in the region serving as the original treasure house of biodiversity. Over the past one decade or so, a considerable amount of interest has been generated in the studies of sacred groves among the ecologists, taxonomists, foresters, environmentalists and anthropologists. The sacred groves (called as '*Law Kyntang'*, '*Law Niam'* and '*Law Lyngdoh'* in the Khasi hills; '*Khloo Blai'* in Jaintia hills, and '*Asheng Khosi'* in Garo hills) are owned by individuals, clans or communities, and are under direct control of the clan councils or local village *Dorbars/Syiemships/Dolloiships/Nokmaships*. The tribal communities of Meghalaya – Khasis, Garos, and Jaintias – have a tradition of environmental conservation based on various religious beliefs. In Meghalaya, sacred groves have persisted through generations due to strong religious beliefs and taboos associated with them. The local people believe that the Guardian spirit or *Ryngkew U Basa* rest in these forests. It is also believed that the spirits of the dead rest in peace in the groves, therefore, they are considered sacred and left undisturbed (Barik *et al*., 2006: 1). All forms of vegetation belong to the deity. The local indigenous people believe that the Sylvan deities would be offended if trees are cut, and twigs, flowers and fruits are plucked. Various cultural programmes, religious rites and rituals are also performed in the forests (Mishra *et al*., 2005: 107). The religious beliefs and myths attributed with the deities preserve a large number of isolated pockets/forest patches (Jeeva *et al*., 2006: 567). As elsewhere in India, particular patches of forests are designated as sacred groves under customary law and are protected from any product extraction by the community. Such forests are very rich in biological diversity and harbor many endangered plant species including rare herbs and medicinal plants. Among the Gangte tribe in Churachandpur district of Manipur, extensive tracts of land were traditionally not subjected to shifting cultivation, since these were considered to be sacred groves and believed to be abodes of spirits.Mizo tribals have safety reserves and supply reserves around the villages. These safety forests are continuation of the SGs of the pre-Christian period. They also have bamboo reserves called mawmund in Sialkal region of northeastern Mizoram (see Gokhale *et al*., 1998). In plains and foothills of western Assam, the forest dwelling tribes like Bodo and Rabha have tradition of sacred groves locally called

Than.In Sikkim, sacred groves are attached to Buddhist monasteries called Gumpa Forest Areas (GFAs) which are managed by Lamas.

Since time immemorial, forests have been playing a dominant role in the history of the Nagas. The Nagas are by nature, dependent on the forest land, which is the best means of their livelihood. It is also inseparably interwoven with the progress of the state. Nature worship was practiced and followed by all the tribes in the State. Unlike in many States, the scared groves in Nagaland are unique. Most of the groves are usually small patches of forest fragments of varying sizes, ponds and streams which are mostly owned by individual or the clans and have a significant connotation. There was neither temples, nor shrines or altars or definite cult objects but made sacrifices by offering eggs, fowls, pigs, dogs to please the keeper (spirits) and deities of the site and also to ward-off any evil spirits from harming them. They basically worshiped the spirits without objects and material image. Hunting, collection of forest wealth and logging are usually strictly done by the owners of the grove. Forest was regarded as the seat of the evil spirit and to cut this forest for *jhum* field, animal was sacrificed necessary to appease the spirit (Nshoga, 2009:220). They also identified the dreaded place in their village, and anyone who ventures to tread the forbidden spot was killed by the spirits. In all the interviews with the locals, the interviewees (see Plate 4.1 and Plate 4.2) gave responses to the specific taboos or actions that prevailed in the recent past. People are not allowed to take anything—hunting, cutting of trees, collecting forest wealth etc., in a sacred grove. People do not harm sacred groves mainly because of socio-religious traditions and fear of unknown, believing that those who cut or use an axe in a scared grove may be harmed or may face consequences by the presiding deity or spirit. These beliefs for ages have strongly influenced conservation of the particular site. The sites not only yield several non-timber forest products but also harbour multiple use livelihood goods, provide habitat, water and nest-sites for wildlife and birds. However, with the coming of Christianity, the religious beliefs and rituals associated with the forest have been declined and are now fast eroding.

Unlike other parts of India, especially the Santals of West Bengal who retained their indigenous beliefs and heritage while superimposing Christianity (Raj, 2007: 243), the Naga religion and culture has been largely replaced by Christianity.

The Christian missionaries made a significant contribution to education system in Nagaland and this played an important role in changing the belief system and their practices of religious beliefs.

4.2: Identified sacred groves in Nagaland

The followingare the few sacred groves identified in the present research:

A) **MOKOKCHUNG DISTRICT** (see Figure 4.2)

i) **Jangjalong** (see Plate 4.3) ('Direct communication'): This is a huge stone, rectangular shaped structure perched atop a hillock. It is situated at Waromung village, 64kms away from the district headquarter and is under the Administrative jurisdiction of an EAC, with Alongkima as its headquarter. The exact location of the stone is 2.5 kms away from the village towards the southern side. The site is 922 meters above the sea level and lies between94°31'05.3" East and26°32'18.3" North. The stone measures about 180ft on both sides and about 120ft towards the west and 22ft towards east.

The stone is acknowledged by one and all to be the abode of a ferocious spirit possessing great supernatural powers. In the remote past traditional rites and rituals were preformed in the area[1]. Hence, the vicinity of the stone was preserved and conserved. The core area is still intact and undisturbed. However, the peripheral area has degraded.

ii) **Yimchingkaba**:The site is at Lakhuni village, Mokokchung district. The site has *wangching* (holes/fissures in the ground). The site is believed to be the abode of an evil spirit. Many years ago, a woman was mauled and killed by a tiger, and so the site is regarded as cursed. Hence, the site has been left untouched and the forest preserved. With the advent of Christianity, superstitions and beliefs lost their hold. In mid-1960s, Pangerchiba Langu, along with another family decided to cultivate the site. At the time of clearing the site, they boiled tea in bamboo. Suddenly, the bamboo burst open and scalded Longkumtoshi's (son of the other family) body nearly killing him. The incident indicated that the site was accursed and that the spirit is still the master of the site[2]. Presently, the area is under cultivation.

iii) **Ngatipang**: The site is about 1km from Ungma village. It lies between 94°30'11.73" East and26°17'46.73" North.The site has a bamboo grove and a cave known as Jentisang Ki (house). The people worship the Ngati god, Jentisang, from a distance since they revere him. In the past a man while hunting around the bamboo groove saw a porcupine and he tried to hunt it. The porcupine ran inside the Ngati cave and the man chased it to the cave. Upon entering the cave he saw a lady (wife of Jentisang) at the entrance, pounding rice. She asked him why he was running after her 'pig'. The man therefore, returned home without the hunt.

Since the site has a bamboo grove, people go there to collect bamboo shoots (a delicacy of the Nagas). It is said that even now Ngati god sometimes come in the dream of the person who collects the bamboo shoots and ask to return it and at the time of jungle burning for *jhum* cultivation if by chance the fire spreads to the Ngatipang area , the area around the cave does not catch fire[3]. At present the vicinity is under cultivation.

iv) **Ngaza**: The site is 3kms from Ungma village towards Settsü. It lies between 94°30'05.7.84" East and26°17'42.72" North.The site by nature has stones arranged in the shape of Arju (Morung), which is believed to be the house of the god (Ngaza tsüngrem). The site belongs to Pongen clan. While hunting at the site pongen clan is always blessed with hunt while other clans do not get any. If there is a dispute between two persons from the village and if the village elders cannot not settle it, the village elders and the priest go to Ngaza site taking some rice along with them and perform ritual by putting the rice in two leaves and wrap them, one each for the two. The ritual is performed by asking the god to interfere and give the judgment. After the ritual the priest opens the leave- the leave with the rice disturbed is pronounced as the culprit. People do not frequent the site as they revere the god. It is said that at the time of jungle burning for *jhum* cultivation even if the fire spreads to other areas, the Ngaza area does not catch fire[4]. Presently the vicinity is under cultivation but the core area is undisturbed.

B) **WOKHA DISTRICT** (see Figure 4.3)

i) **Mt.Tiyi** (see Plate 4.4): The importance of the area lie in the fact that the locals believe it to be the place where the spirits of the dead washes their feet on their journey to the land of dead and had been revered and conserved in olden days.

Mt.Tiyi lies above the township of Wokha, 80kms from the state Capital, forming as the main catchment area of the town. It covers an area of about 317 ha. and lies between 94°16'27.55" East and 26°12'32.59" North. Owing the population pressure and unscrupulous deforestation, there had been a gradual decline in the green cover of the area[5].

ii)**Potsow lan** (see Plate 4.5) ('Path way of the gods'): This site is 487 meters above sea level. It is a path way between Mt.Totsu and Mt.Tiyi, under Wokha district and is 28kms from the district headquarter. The locals believe it to be the path way of the Gods. In olden days, due respect was given by not resting on the path and keeping the area free from cultivation. It lies between 94°07'07.2" East and 26°01'31.9" North. According to the locals, the path remains clean and clear all round the year. Even to this day the people preserve the path. However, for the past 10 years, the surrounding area is under cultivation[6].

iii) **Limyon** (see Plate 4.6) ('Red field'): The site is at Echuyonton under Wokha district. It is situated at an altitude of 558 meters above sea level and lies between 94° 09'1.6" East and 26°02'06.9" North and The site is 30kms from the district headquarter. The area belongs to Aremo, Asao and Anyimo clans. It is said that in a fight between Mt. Totsu and Mt. Tiyi, Mt. Tiyi decapitated Mt. Totsu and placed the head at Limyon. The dripping blood from the head of Mt. Totsu made the area red. Hence, the people regarded the area as unwanted and unclean. Hence, the area was untouched for a long period of time.

With scarcity of land for cultivation and with the increase in population, in 1953-54 a family cultivated that land and their daughter died. In 1962-63, a widow also cultivated and she too died. Again in 1973, two families cultivated and the consequence was from one family, the father died and from the other, the son[7]. Since then, the area is left uncultivated though the yield is good. However, the surrounding area is disturbed.

iv) **Liko Emvu**(see Plate 4.7) ('Unclean land'): The site is at Yanphiso, 28kms from districtheadquarter and is 276 meters above sea level. It lies between 94°19'1.4" East and 26°04'05.4" North. The land belongs to Tsanglao clan. In the upper part of the land, there is a pond and the locals believe that a keeper (spirit) resides there. The area is uncultivated and people do not even trot the area because there

are many instances of people facing negative consequences for setting foot on the land. The land, therefore was regarded as unclean, hence was preserved[8].

v) **Ali-Merum** (see Plate 4.8) (‘Red Soil’): The site is located at N. Longidang village, under Wokha district. It is situated at an altitude of 782 meters above sea level. It lies between 94°28'11.6" East and 26°88'18.5" North.The locals believe that the head of evil spirit (*Tsüngrhan*) from the North beheaded the evil spirit of the South during a fight. The body was buried in a place called *Tsüngrhan Khup* (evil Grave) and was covered with slate, which can be seen even today. The people believe that due to their fight red soil came out from the bottom making the area unsuitable for cultivation. At present the area is preserved[9].

vi) **Sako-Selek** (see Plate 4.9): The site is located at N. Longidang village, under Wokha district and is situated at an altitude of 458 meters above sea level and lies between 94°09'22.8" East and 26°02'27.2" North.The place is believed to be the meeting place of the evil spirit (*Tsungrhan*). Common people feared to venture in that area. Only the chosen one i.e., a messenger for the living and the dead could visit the site. The messenger used to perform rituals to please the spirit. During their forefathers’ time, the place was covered with thick forest and even birds could not fly out from that place. At present, the area is disturbed due to deforestation[10].

C) **PEREN DISTRICT** (see Figure 4.4)

i) **Ihaingkicia**(see Plate 4.10):The site is situated at Peren village and is 1443 meters above sea level. It lies between 93°44''38.2' East and 25°30''34.6' North. The locals believe that *Herabe* (spirit) resides there. Therefore, the people revered the area. It is said that during the head-hunting days the spirit protected the villagers from external attacks. There are also many instances of people encountering with the spirit. Though the area was not cultivated, making traps and collection of cane and fire wood was done. Rituals were also performed by offering white cock to please the spirit. At present, the area is moderately disturbed[11].

ii) **Mt. Herapaitu**: It is situated at Peren village and lies between 93°44'16.99" East and 25°30'34.61" North. The legend behind this site is spirit *Nchang* from the

South-West got engaged to a lady but could not marry her. She married Herapaitu instead. *Nchang* composed a song for his lady love requesting her to look back to him. People used to see shawls displayed at Mt. Herapaitu, especially in the evening. In the remote past, during Hega festival, when a dancing troop visited this part of the village, they saw the spirit viewing their dance sitting on a tree[12]. The people therefore, preserved the area as a sign of reverence to the spirit. At present, it is a recreation place. The groom to be usually takes his bride to Mt. Herapaitu, showing that their youth life is coming to an end.

iii) **Mt. Pauna**(see Plate 4.11):It is situated at Peren district and lies between 93°51'35.46" East and 25°35'38.56" North. Locals believe that some unknown factors are controlling the area. If the people want to collect jungle products or cut down a tree, they have to first perform ritual by offering a pig or ill luck will befall on them. As recent as 2012, a family, in spite of being Christians, sacrificed a pig for felling trees. At present, the foot hill of the mount is under cultivation[13].

D) **ZUNHEBHOTO DISTRICT** (See Figure 4.5)

i) **Yemetsu Lhove**: The site is located at Mishelili village, under Zunheboto district. It lies between 94°60'09" East and 25°53'28.9" North. The village is under the administrative jurisdiction of an ADC, Pughoboto, Headquarter. The locals belief that a spirit named *Yemetsu* resides there. During the forefathers, days the people of Mishelimi saw the spirit *Yemetsu* coming out from a hole. They closed the hole with a big stone to prevent the spirit coming out to overpower the people. The stone is still intact. No human ever entered earlier. Even to this day, some people fear to go to that place because they believe the place might be still haunted[14].

ii) **Sungato**: The site is at Mishelimi village. It lies between 94°15'42.1" East and 25°53'8" North. The locals believe the site to be cursed by the spirit of an angry old woman since her pig was killed and eaten by the people from the Chella clan. In the olden days people feared to go there and the area was preserved. At present the site is a frequent picnic spot for the youth[15].

E) **TUENSANG DISTRICT** (see Figure 4.6)

i) **Khinuhanlu** (see Plate 4.12)('Dog's sacrifice place'): The site is situated at Kuthur village, 10kmsfrom Tuensang district, is 1250 meters above sea level,

with coordinates 94°49'20.3" East and 26°00'50" North. Till the recent past, if the villagers wanted to cultivate land, they had to sacrifice a dog to the keeper of the site. If the sacrifice was not made, a member of the village would die. Hence, the site was left uncultivated. However, recently i.e., 2013, construction of a link road has disturbed the area[16].

ii) **Pelungkechup** (see Plate 4.13): The site is situated at Kuthur village,10kmsfrom Tuensang district and is 1254 meters above sea level and lies between 94°48'24.7" East and 26°00'00.1" North. The people believe that the king of devils, *Akokoba* reside there. In the recent past, no one ventured into the surrounding area. The villagers believe that whosoever hear any noise or sound coming from this place, death is inevitable for that person. Hence the site is neither inhabited nor disturbed[17].

iii) **Khaiknohanlu**(see Plate 4.14)('Pigs sacrifice place'): The site is situated at Kuthur village,10kmsfrom Tuensang district and is 1254 meters above sea level, lies 94°50'20.7" East and 26°00'40.4" North. Owing to growth in population and with limited land for cultivation, the area has recently been brought under cultivation. Rituals are performed by offering pig, ginger and wine to please the keeper. Once rituals are over, it is said that clearing of the site to be cultivated has to be completed that day itself, else death will be brought upon the family[18].

iv) **Wonoshiyeh**:The site is located at Kuthur village, 10kms from Tuensang district. It lies between 94°49'37.88" East and 26°00'3.53" North. All the year round, birds come to drink water to this stream. It is said that only the brave go towards the stream to hunt for birds. If a person, after killing birds takes rest in others' fields, ill- luck befalls on the owner or in most cases the owner dies. The inhabitants of the area says that whenever people go for hunting to the stream, the keeper disturb them by throwing stones at them. Till to this day the vicinity is not disturbed[19].

v) **Meiksuk-ke**(see Plate 4.15)('Abode of jealous spirit'):The site is at Chessor village, 56kms from Tuensang district and is 1225 meters above sea level, lies at 94°45'31.2" East and 26°00'40.2" North. The locals believe the site to be the devil's village. It is said that the devil rear livestock and can even hear the devil's call to pigs to come and feed. With development and growth in population, the site has come under cultivation. However, pig sacrifice is done. Sacrifice is performed

by the head of the Lims clan. Due reverence must be given while performing the sacrifice, failing which the owner of the land will face consequence in the form of death. At present even though the site is under cultivation, locals believe that the keeper still reside there. In June 2013, Murthung a native of the village died after coming back from the site and villagers believe that the keeper of the site cut off his head[20].

vi) **Longkhunpit** ('Stone hole'): The site is at Chessor village,56kms from Tuensang district and is considered sacred by the locals. It lies between 94°43'5.78" East and 26°04'49.96" North. The significance of the site is the presence of a stone with a hole. After the sowing, if there is no sufficient rainfall, one or two elders from the Khephuru clan goes to the site to evoke rain. Stone chips and mud mixed with water on a bamboo mug is thrown on the stone. After performing the ritual, they cover their head with banana leave and chant, '*Arilo*' (let the rain be with us). However, if rain catch them before they reach home, they die. On 18th June 1986, Shokhemba was sent to evoke rain, since rainfall was late that year. He was successful in performing the ritual, but unfortunately he was caught by the rain and the following day, he passed away[21].

vii) **Asheru Long Khean** ('Path of spirit of the Dead'):The site is located at Chessor village,56kms from Tuensang district and lies between 94°43'27" East and 26°04'53.7" North. The locals believe that all dead spirits pass the site. The area, therefore, considered unclean, remained untouched till the recent past. It is said that the spirits take their livestock along with them and while crossing the site, hit a stone with a spear, then goes to a pond (*Asheru Lonrike*) and takes bath to free itself and to affirm that they no longer belong in this world. In this pond, strands of hair are found which is believed to be of the spirits. The spirits then proceed to a tree and take rest. Here they tie up all the animals they had carried with them before they depart for the other world. At present, the site is disturbed due to human interference[22].

viii)**Mihshe jin** ('Path way of the *Arimre*'): The site is at Chessor village, 56kms from Tuensang district. It lies between 94°43'12.08" East and 26°08'7.18" North. According to the inhabitants, conversation of *Arimre* (devil) and cries of babies can be heard from the site. Legend has it that during a fight among the *Arimre*,

Rishila was killed and buried there. No trees or vegetation grows there and the site remains bare all year round. Hunters rarely go to the vicinity of the site to hunt. Even if they go, they do not find their prey. Also, even if they do find a prey they do not find their kill[23].

ix) **Wohnu-ya** ('Abode of birds'): The site is at Sotokur village, 33kmsfrom Tuensang district and is 1222 meters above sea level. It lies between 94°47'05.7" East and 26°08'05.2" North. The site has a pond. Locals believe that spirit/keeper of the pond heals/cures the sick. A *Thümürü* (Witch) performs the rituals by taking some ginger and rice from the sick person. At night*Thümürü* takes the offering to the keeper of the pond. Owing to population pressure the area is used for cultivation. However, the owner of the land has to perform ritual by killing a dog to please the keeper[24].

x) **Moyit ke-chih**('Mountain cut in the shape of a tail'): The site is at Sotokur village,33kmsfrom Tuensang district. There is a pond on the foot of the mountain. People do not drink the water from the pond because it is believed that it is the abode of the *Arimre* (Satan). Moreover the area around the pond is covered with thick forest growth that it is difficult for the people to get access to the pond. The pond remains clean all year round. It is believed that the *Arimre* keeps the pond clean. At present, the area has been disturbed due to construction of link road[25].

xi) **Shih Yeanyung**: The site is situated at Sotokur village, 33kmsfrom Tuensang district. The Limkhiung Kheiungru clan has the sole right to get all the wealth from the site. Even the keeper (spirit) of the site blesses only the clan members if they hunt in the area. Other clans out of fear to invite trouble/consequences do not venture in to the site. Till recently, the site was revered. However, at present the vicinity is under cultivation[26].

F) **MON DISTRICT** (see Figure 4.7)

i) **Oloanu** (see Plate 4.16): The site is at Zakho village, Mon, and lies between 95°05'58" East and 26°49'20.20" North. There is a pond, where the level of water remains constant. Locals believe a spirit reside there. Till recent years, the vicinity was kept untouched. During winter months, the water turns reddish in colour.

Locals say that if the water remains reddish for 2- 3 months, there will be no rainfall. During World War-II, the British used the pond to dump their arms and ammunitions. After the war, they tried to retrieve them, digging drainage to drain the water out. Before they could dry out the water from the pond, one British officer dreamt that they have to give offering to the keeper - six black cocks and six white cocks, which was interpreted as six men from the village and six British. The British therefore gave up the idea of retrieving their arms and ammunitions.

If rainfall is late in a particular year, people throw stones to evoke rain. If the villagers want to clean the pond, they have to fast for three days. In late 1970s, Pongting from Sangyu village laid trap on the drainage dug by the British to catch fishes. He was warned by the elders not to do so, but he did not listen. He suddenly fell sick. He was carried home and died after reaching the village. In 2004, some youth from the village were cutting down a tree. While cutting the tree, it fell to the pond. As a consequence, the village got heavy rainfall accompanied by strong harsh wind. The church and six houses were destroyed by the storm. At present too, no one collects anything from the pond, but the vicinity is under cultivation[27].

End notes

1. As narrated by Kiremwati Aier, 86 years. Retd. Pro-Vice Chancellor, NEHU andAlemchiba Ao, 85 years; Waromung village, Mokokchung District during an interview conducted at their respective residence at Kohima on 11/10/2014. Also see J. P. Mills, *The Ao Nagas*, 1926.
2. As narrated by Rev. Dr. Toshi Langu, 64 year; Lakhuni village under Mokokchung District during an interview conducted at his residence at Kohima on 05/10/2014.
3. As narrated by C. Yashikaba, 75 years; Ungma village under Mokokchung District during an interview conducted at his residence at Kohima on 03/10/2014.
4. Ibid.
5. As details given by Supongnukshi, IFS.
6. As narrated by Nchumbemo Tsanglo, 60 years and Renphamo Tsanglo, 48 years; Sankitong village under Wokha District during an interview conducted at their residence on 27/06/2013.
7. Ibid.
8. Ibid.
9. As narrated by Ntsomo Murry, 86 years and Nyimtsemo Ezung, 83 years; N. Longidang village under Wokha District during an interview conducted at their residence on 26/06/2013.
10. Ibid.
11. As narrated by Chubam, 78 year; Peren village under Peren District during an interview conducted at his residence on 30/07/2013.
12. As narrated byAsiakep Sephe, 53 years; Peren village under Peren District during an interview conducted at his residence at Peren town on 30/07/2013.
13. As narrated by Heisuiding Irangbe, 80 years and Ingimangbe Thoü, 86 years; Benru village under Peren District during an interview conducted at their residence on 31/07/2013.
14. As narrated by Hovishe Wotsa, 89 years, Khupu, 72 years, Tokiye, 54 years, and Khulu, 56 years; Mishelimi village under Zunhubhoto District during an interview conducted at Guanboras house on 12/09/2013.
15. Ibid.

16. As narrated by Shochah, 60 years, Neoji, 61 years, Ritsong, 55 years and J. shokhum, Chairman Village Council, 72 years; Khutur village under Tuensang District during an interview conducted at the village council hall on 12/02/2014.
17. Ibid.
18. Ibid.
19. Ibid.
20. As narrated by Throng Kiuba, 2nd Head Guanbora, 67 years; Chessor village under Tuensang District during an interview conducted at his residence on 13/02/2014.
21. Ibid.
22. As narrated by Nokrunba, Head Guanbora, 81 years; Chessor village under Tuensang District during an interview conducted at his residence on 13/02/2014.
23. Ibid.
24. As narrated by Lothrong, 87 years, Dokiu, 46 years and Shobhu, 88 years; Sotokur village under Tuensang District during an interview conducted at Guanbora residence on 14/02/2014.
25. Ibid.
26. Ibid.
27. As narrated by Nokao, 52 years, Zakho village under Mon District during an interview conducted at his residence on 08/05/2014.

CHAPTER5

GENESIS OF COLONIAL LAWS IN FORESTRY

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5.1: Evolution of Forest Laws- An Indian Perspective

By 1860, Britain had emerged as the world leader of deforestation, devastating its own woods and forest of its colonies to draw timber for ship-building, iron smelting and farming. For the British, the destruction of forest was used to symbolize political victory (Gadgil and Guha, 1992: 118). The early treatment of Indian forest by the British Raj confirmed the view held by many that the British were responsible for the beginning of the process of depletion of India's forest wealth (ibid.: 119). The earlier British administrators were more occupied with the building up of an empire and therefore never thought of the important part forest have played, and would play in the household of nature, or of the immense influence forests exercised on the physical well-being of the country. The building of the railway network in 1853 was a crucial watershed in the history of Indian Forestry. The demand for timber was intensified for railway sleepers; hence large numbers of forests were filled leading to deforestation in many provinces. From the latter part of the 18th century, the Indian Forest Department was entertaining repeated request from the British admiralty for supply of Madras and Burma teak (ibid.). The earliest record of such attempts was the formation of the timber syndicate in Malabar in 1796. It did not last for long but some other agencies, purely connected with the supply of timber for navy, were opened, closed and reopened from time to time (Ribbentrop,1889:62).

Keeping in view the importance of natural resources and commercial significance of forest resources, certain regulations were formulated and implemented during the colonialadministration to appropriate revenue benefits from the forest-based resources. Thebeginning of a forest policy in pre-independent India started in 1855 when the then Governor General, Lord Dalhousie, issued a memorandum on forest conservationrestricting the customary rights of the forest dwellers on the use of forest resourcesthrough a ban on their movement in the forest (Sarangi, 2013: 15-16). Then the conservancy of Indian Forest was started with the appointment of Conservators in the Malabar (1806), Bombay (1847) and the Madras Presidencies

(1856). The first attempt at asserting State's monopoly was through the Indian Forest Act of 1856 (Ribbentrop, *op. cit*.: 64-66). This law simply established the government's claims over forest. The government blamed deforestation on the practice of shifting cultivation. Tribals were discouraged from hunting and their use of forest products was severely restricted although it was governed and regulated by community sanctions. Further, the Indian Forest Act (IFA)1865 was enacted which empowered the government to declare authority on such resources for national interests. Within a few years of the enactment, there was complains that there was inadequate state control over forest lands. The British colonial administration therefore, enacted Forest Act of 1878, whichclassified all forests of India into three categories, i.e., reserve forest, protectedforest, and village forest keeping in view the national forest policy. This Act also gave foresters powers to determine how forests were to be managed. Later, the 1878 Act was replaced by Indian Forest Act of 1927(Sarangi, *op. cit*.: 16). The Act codified all the practices of the forest officials and regulated further people's rights over forest land and produce. The Act embodied all the major provisions of the earlier Acts, extending it to include those relating to the duty on timber. The Act also deleted the references to communities' rights over forests, which were made in the 1878 Act. A clear emphasis on the revenue- yielding aspect of forest was therefore drawn through this Act.

The Imperial Forest Department was formed in 1864, with the help of German foresters. The Forest department was started because the government became aware that the magnificent forest of India and Myanmar were being worked by private enterprise "…in a reckless and wasteful manner and were likely to become exhausted if supervision was not exercised" (Guha, 1983: 184). The colonial intervention, especially in deforestation and subsequently in forest conservation, irrigation and soil protection exercised a far more profound influence over most people than the more conspicuous and dramatic aspects of colonial rule that have traditionally preoccupied historians (Deori,2005: 33).

The Forest Act of 1865 was introduced (Mohapatra and Mohapatro,1997: 72). The act empowered the government to appropriate any land covered with trees, however, notification could only be effected, if existing rights of individuals and communities were not impinged upon (ibid.). This initial act was superseded by a more inclusive piece of legislation, in the Indian Forest Act of 1878, which was

particularly concerned with removing the ambiguity about the 'absolute proprietary right of the state'. The new act was designed to facilitate strict state control over forest resources, and was distinctly 'annexationist' in nature. Baden-Powell, in whose charge the drafting of the forest act lay, put forward a 'legal sleight of hand' that sought to remove all concessions and 'rights' that were not explicitly granted by the state (Gadgil and Guha, 1992: 133-140). The British colonial government had presided over the unprecedented denudation of the vast forest cover to meet commercial as well as strategic needs of the empire, in utter disregard for the rights of forest-dwellers and users (Guha, 1983: 186). Indeed, the colonial forest policy had not only destroyed subsistence farming, but also made ineffective the traditional methods of managing forests (Buchy, 1998: 669). In other words, the efforts aimed at conservation have failed to recognize the customary rights of the forest-dwellers, and it also becomes evident that the colonial administration had actively pushed forward commercialisation of forests (Guha, 1983: 185).

The National Green Tribunal (NGT) established under the National Green Tribunal Act, 2010 on 18th October, 2010 for the effective and expeditious disposal of cases related to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multidisciplinary issues. The Tribunal shall not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by principles of natural justice[1].

5.2: Beginning of the Colonial Forest Policy in Naga Hills

Prior to the coming of the British, there was no Forest Policy in the Naga Hills. The mid nineteenth century with the growth and development of the British administration under the British Government of India, forest administration and conservancy efforts were administered in the Naga Hills, which was a district of Assam till 1881. The British directed their policies primarily towards practical and pressing problems such as establishment of law and order, the foundation of administrative system and the dispensing of justice and not the least for the raising of the revenue necessary for the discharge of the functions of the government. According to Verrier Elwin, "The

British Government inclined, on the whole, to leave the tribesman alone, partly because of the task of administration, especially in the wild border areas was difficult and unrewarding, partly from a desire to quarantine the tribes from possible political infection, and partly because a number of officers sincerely held the view that the people were better and happier as they were[2].Moreover, the proprietorship of the forest land at the time of British occupation varied in accordance with the political and historical developments of each province (Ribbentrop, 1889:97). Where the population also had settled in joint village communities, any forest or wasteland that fell within the boundaries of the village was considered as a rule to be common property. This had been recognized in all settlements made after the British occupation of the country. In the case of the other un-united villages, no right to the waste was ever recognized (ibid.). Besides, there were parts of Assam such as the Garo, Khasi, Jaintia and the Naga-Hills the whole of which remained more or less forest or waste, with next to no permanent cultivation, and where a sparse and scattered population lived almost entirely by *jhuming* (ibid.).

The Forest Department of Assam was formed in the year 1868. Initially it was a part of the Forest Department of Bengal. The Government Forest in Assam managed under the Bengal Forest Rules, sanctioned by the Supreme Government, which were gazette under Act VII 0f 1865, either as “reserves” or “open-forest” (Handique, 2004: 32). The government gained control over the reserved forests and their products and in the open forest, the authority of the Forest Department extended only to the protection of some species of trees. Even in the remaining un-classed forests, the government retained monopoly rights over trade in forest produce. With the reorganization of East Bengal and Assam in 1912, the forest of Assam was organized into eastern and western circles. While the former consisted of the forests of Lakhimpur, Sibsagar, Lushai Hills, Cachar, Sylhet and North East Frontier Tracts (Present Arunachal Pradesh) and it also dealt with the forestry issues of the Naga Hills district and the princely state of Manipur. Upto 1957, the whole of Nagaland were in the charge of the Chief Forest Officer (Deori, 2005: 52).

The early colonial Forest Policy in the Naga Hills was directed to the Forest management of Assam and was directed to the exploration of its economic resources. As early as 1845, Francis Jenkins, the Agent to the Governor General of North East Frontier Agency, send Captain John Bulter to Naga Hills on a commercial mission.

He was received at Mezoma, Khonoma and Birema where allegiances to the Government were renewed by the chiefs who promised to remain tributary with the British. An outpost at Chumukedima was therefore opened; trade with the Naga villages was extended and communications with Sibsagar were improved (Bareh, 1970: 27). However, for the colonists, compared to extensive rich forests of Assam plains and foothills, much of the hill forest has less commercial potential. Therefore, all the regular administration especially, the land use policy in the Naga Hills District by 1891 would be expected to be far less intrusive in the Naga Hills. During the British administration, management of the forests was done according to the Assam Forest Regulation of 1891 by which the extraction of timber was regulated under terms and conditions of agreements drawn up with the coupe-holders who paid a certain amount of security. Felled trees were measured and marked with government passing hammers and with serials and allowed to be extracted under cover of transit pass and chalan issued by the forest conservator officials (Deori, *op.cit*.: 53). The Regulation III of 1946 was framed and passed by His Excellency, the Governor of Assam, F.C. Boure, in order to safeguard and regulate the rights of Nagas to *jhum* land in the Naga Hills districts (Stebbings, 1992:266). The Naga Hills Jhumland Regulation, 1946, contained provisions for the prevention of soil erosion. The provisions under the said regulation provided the land conservator with a wide range of powers for the conservation of land and forest. Violations of the regulation in any manner resulted in the form of imprisonment of either for one month or with a fine not exceeding five hundred rupees or with both (see Appendix-3). The Act also contained that village forests belonged to the people who had absolute rights for cultivation and other purposes. But the erstwhile Assam forest regulations have been replaced by the Nagaland Forest Act 1968 which entitles government to carve out forest reserves on the basis of awarding compensations to the holders or authorities who own the forest, after assessing the existence, nature and extent of any rights claimed by them (Bareh, *op.cit*.: 108). The steadily growing restrictions on forest right and dispossession of customary rights, particularly after the passing of the 1878 Forest Act, all had it in fact, ended notions of flexibility. The introduction of colonial forest and land management structures, albeit designed to check climate change and promote sustainable resources use, actually brought about frequent clashes and contest over land use. These typically involved the colonial state, private companies

and local people, as separate and competing actors in the context of governance, protest and manipulations (Deori, *op.cit.*: 78).

Although there was no policy imposed as such on the Naga Hills, the Forest Policies such as the Government Forest Act, 1865, the Indian Forest Act of 1878, The Indian Forest Act of 1927, strengthened the State's control over the forest area and resources through the regulation, hampering the Customary Rights of the people. Upto 1957, the whole of Nagaland was under Forest Division of Assam. From 1961 to 1963, forests of Nagaland were in the charge of the Chief Forest Officer. It was on 1st February 1963 that the Directorate of Forest came into being (ibid.).

5.3: Forest Legislations: Post-colonial Era

i)**The National Forest Policy**

India is one of the very few countries of the world where forest policy is in operation since 1894. In 1952 and 1988, revisions were made in the forest policy of 1894. The National Forest policy of 1952 recommended that the country should aim at coverage of one-third of the total land area under forest (60 per cent in hilly and mountainous areas, and 25 per cent in the plain). It has suggested the extension of tree-lands on river/canal banks, roads, railways, cultivable waste and which are not suitable for cultivation. It has classified the forests of the country into four categories; i) Protected forests (essential for physical and climatic needs), ii) National forests (to be utilised for the economic needs of the country), iii) Village forests (to meet the fuel and domestic needs of villages and neighbouring towns), iv) Tree lands. The policy envisaged the annual organization of *Van-Mahotsava* and tree plantation week in the month of July and August.

The National Forest Policy 1952 lays emphasis on:

1. Weaning the tribal people by persuasion to desist from shifting cultivation.
2. Implementation of forest laws more effectively
3. To provide adequate facilities for the management of forest resources.
4. To control grazing of cattle, sheep and goats in forest areas.
5. Providing fuel-wood to rural areas.
6. To improve the availability of timber wood for industrial purposes.

7. To increase the area under social forestry
8. To promote research in forestry (Sebu, 2013:76-77).

In order to ensure that natural resources are conserved in a judicious manner and its exploitation shall have no adverse impact on the environment, a large number of Acts have been enacted over a period of time. The Indian Constitution Article-47, which directs the state "to improve the living standard of living and public health", a provision has been inserted in the Directive Principles of State Policy (Article 48-A), which declares that "the State shall endeavor to protect and improve the environment and to safeguard the Forest and Wildlife of the country".

ii) **The Nagaland Forest Act, 1968**

The Nagaland Forest Act, 1968, is referred to for management of Government Forests. This Act is applicable to the whole State since 1st April 1968. An overview of the Act includes:

Chapter 1: Preliminary (Defines Cattle Reserved Forest, Village Forest, General protection, Forest officers, Forest produce, Timber, Tree etc.).

Chapter 2: Reserved Forest (Notification, Proclamation by forest settlements of claims, appeal against the settlement, Final Notification, Extinction of the rights, Acts prohibited by the Act like fire, felling, girdling etcetera, poisoning, quarrying).

Chapter 3: Village Forest (any land put at the disposal of the government as village forest by the community for its benefit and regulations etc.).

Chapter 4: General Protection of Forest and Forest produce (reserving any tree and its protection, protection of Unsettled Forests).

Chapter 5: Control over the Forest and Wasteland not being the property of the government (breaking or clearing, preservation of soil, public health, maintenance of water supply, power to assume the management of the forest in case of willful negligence).

Chapter 6: Control of Forest produce in transit (import, export, transit, river rafting, transit in water or land, revenue station, penalties etc.).

Chapter 7: Collection of drift, stranded and other timber (certain kinds of timber to be deemed the property of the government until the title is proved thereto, claims and disposal).

Chapter 8: Penalties and Procedure (seizure of property, release of the same on furnishing the bond, court to settle the confiscation etc.).

Chapter 9: Cattle trespass and penalties thereof.

Chapter 10: Forest Officer (State government may invest any officer by name or as holding an office, power to enter any premises, survey, demarcate, etc.).

Chapter 11: Supplementary Provisions.

The Wildlife (Protection) Act, 1972, specified endangered species to be protected regardless of location i.e. all species are to be protected (Annual Administrative Report, 2012-2013:45-46).

iii) **Nagaland Jhumland Act, 1970**

Nagaland Jhumland Act, 1970, is applicable to the whole of the State since April, 1974. This Act has broadened the meaning of forests. It has brought the *jhum* land under the ambit of Forest Department as far as movement of forest produce emanating from there is concerned (ibid.: 46).

iv) **The Wildlife (Protection) Act, 1972(as amended in 2002)**

This Act is applicable to the State of Nagaland. This Act adopts a two-pronged conservation strategy: (i) specified endangered species are to be protected regardless of location (ii) All species are to be protected.

The Object of the Act is to arrest the rapid decline and provide protection to the Wildlife population. The Act also strives for regulating hunting of wild animals and birds (Chapter-iii). Procedure for declaring areas as sanctuaries and national Parks are prescribed in Chapter-iv. There is prohibition on hunting of all animals as mentioned in Schedule I to IV. The Act also regulates trade in wild animals, animals' articles, trophies and subject to the provision of Chapter-v (A), prohibits dealing therein without a license. Through an Amendment Bill, 2002, the amended Act

proposes to create two new categories of protected Areas, i.e.., Conservation Reserves and Community Reserves (ibid.).

v) **Forest Conservation Act, 1980**

The Forest Conservation Act 1980 was enacted by the Parliament with a view to check further deforestation which ultimately results in ecological imbalance. As such, the provisions made therein for the conservation of forests and for that matters connected therewith, must apply to all the forests irrespective of the nature of ownership or classification thereof. The Act has made prior approval of the central government for necessary de-reservation of reserved forest and use of forests for non-forest purposes. However, the said provision cannot override the Constitutional safeguard as guaranteed under Article 371A[3]. As such, the Forest Conservation Act, 1980 which has direct bearing over the ownership and transfer of land and its resources cannot be extended in the State of Nagaland unless the Legislative Assembly of Nagaland by a resolution so decides.

In consonance with the National Forest Policy 1988, which lays emphasis on the protection, conservation, regeneration and development of forest, the objectives of Nagaland State's Forest policy has been designed to:

1. Convert Jhumland areas into economically and ecologically sustainable woodlands.
2. Regulate harvesting of forest resources on principles of sustainability.
3. Protect and conserve fauna and flora including endangered species.
4. Protect, conserve and manage Bio-diversity in and outside Reserved Forest and Sanctuaries based on sound scientific principles for *in-situ* conservation.
5. Raise and develop commercially important species.
6. Bamboo Policy with valuable and active inputs from the Department has been formulated by the State Government (ibid.:23).

vi) **Nagaland Tree Felling Regulation, 2002**

In compliance with the direction if the Hon'ble Supreme Court dated 12/05/2001, the Government of Nagaland has framed and approved the "Nagaland Tree Felling Regulation 2002" vide No. FOR/GEN-7/200-ii. Dated Kohima, the 11th July 2002 to regulated wood harvesting in private plantation (ibid.: 47).

vii) **Biological Diversity Act**

Biodiversity, in essence, is the totality of all life on earth. Both in wild and domesticated forms, biodiversity is the source of food, medicine, clothing and housing, most of the cultural diversity, and most of the intellectual and spiritual inspirations. It is, without doubt, the very basis of man's being. Its conservation therefore is of utmost significance. Convention of Biological Diversity (CBD) 1992 offers a major opportunity to safeguard and conserve the biological capital at global and regional level(Anubhav *et al*., 2009: 2).

The Biological Diversity Act, 2002, deals with the biodiversity conservation, management, access to Biological resources, sharing of benefits, patent Constitution, power and function of National Biodiversity Authority and State Biodiversity Board. This Act was enacted by the Parliament in the year 2002 and received assent of the President of India on 5th February, 2003. The Bio-diversity Act, 2002, if extended in the State of Nagaland, shall amount to a fresh and deeper encroachment over the rights of the Nagas as protected under sub-clause 1 (a) (iv) of Article 371A of the Constitution of India and also Section 2(d) of the Nagaland Ownership and Transfer of Land and its Resources Act, 1990 (The Nagaland Act No.1 of 1993)[4].

The following are the thrust areas of the Act:

1. Access to biological resources and information.
2. Benefit sharing with conservers of the biological resources and holder of knowledge and information relating to use of biological resources.
3. Notification of area important from the stand point of bio-diversity as biological heritage site.
4. Involvement of local bodies in sustainable management of bio-diversity and preparation of bio-diversity register.
5. Establishment of State Bio-Diversity Boards and Bio- Diversity Committees at block/ village levels.

The State Bio-Diversity Board has been reconstituted under the Chairmanship of Shri.T.Angami (Retd. Principal Secy) and CCF (EBR) is the Member Secretary of the State Bio-Diversity Board (Sebu, 2013: 76).

End Notes

1. Annual Report 2011-12. *Ministry of Environment & Forests Government of India*, p.276
2. Allen, B.C. (1905). *Gazetteer of Naga Hills and Manipur*. Vol. ix
3. Article 371A: Special provision with respect to the State of Nagaland
   (1) Notwithstanding anything in this Constitution,
   (a) No Act of Parliament in respect of- i) religion or social practices of the Nagas, ii) Naga customary law and procedure, iii) Administration of civil and criminal justice involving decisions according to Naga customary law, iv) Ownership and transfer of land and its resources, shall apply to the State of Nagaland unless the Legislative Assembly of Nagaland by a resolution so decides.
4. Section 2(d) of the Nagaland Ownership and Transfer of Land and its Resources Act, 1990 (The Nagaland Act No.1 of 1993) "land and its resources" means advantages derived from the surface of the land and all that is below it and which is valuable or is a source of money or income include- Minerals; minerals oils, petroleum and petroleum products (including liquid petroleum) and every other product of mines including forests and forest products.

CHAPTER 6

CHANGING SCENARIO OF FOREST LAND

Changing scenario of the forests land is natural. This is more so as the society moves under the influences and impact of modernity. However, in the march of modernity the consequences ahead must be taken into account. The colonial power in the Naga Hills tried to bring about some changes with the help of the Forest Department on use of lands. Mr. Meiklijohn posted temporarily to the Naga Hills District from May 1922 to the end of July 1922 and again Deputy Conservator of Forests in the Naga Hills has done valuable work in demonstrating the value of conserving jungle in order to ensure an adequate and constant supply of water in the streams in the Tizu Valley[1]. The Deputy Conservator of Forest Kohima started the re-forestation work in the Naga Hills[2]. Mr. Bor during the year 1924-25 in the Naga Hills under his supervision alder cutting were put out in the Sema country[3]. The Pulebadze reserve which was partially planted during the year and in other year was fully planted. In addition to the small cane reserve, formed by the Sub-Divisional Officer of Mokokchung, a large reserve was constituted by Mr. Bor on the slopes west of Hoikiya[4]. To affect regeneration, fuel cutting in the Pulebadze Reserve for the Assam Rifles had been stopped from 1936[5].All these efforts indicate the colonial discourses on deforestation and climatic change.

There are reports on the use and change in the forest land during the colonial period. E.T.D. Lambert, D.C Naga Hills, observed, that "there was shortage of good land in range-Lakhuni, Changchang and Merinokpho. Only for the pan trade these villages would not be able to exist[6]. "Proposal of Deforestation of a portion of Nambar reserved was recorded in the diaries of the colonial rulers. The burning of jungle- a traditional practice during the dry and windy months contributes to devolution of forest. 1st April 1938, E.T.D. Lambert, observed that "no shade and all the jungle burnt down few miles around Chakhabama." Though plantation activities were carried out at different times, jungle fires is a regular affair. These regular annual infernos signed the lost of vegetation[7]. In 1942, the British Government moved to deforest the Diphu Reserve near Dimapur in Sibsagar. In an official order of the

government, 200 families of Nagagaon, Nepaligaon, Uria Bangaligaon, Dimapur town, Dhansiri Jharani, Dhanshiri Bangaligaon, Darogapatjar, Ikranigaon and Ikrani Pathar villages of Dimapur are to be evacuated due to military acquisitions of the land in these villages[8].

Slash and burn agriculture method known as *jhum* or shifting cultivation or swidden agriculture is an age old practice of land use. *Jhum* cultivation is an integral agricultural system that is fulfilling the needs of population since decades. The jungle is cleared and is left to dry till the end of February or the beginning of March and then fired to enrich the soil. They used to scrape the fields clean as best they could and raise their miserable crops on the land so cleared (Mills, 1926: 111). The *jhum* cultivation also offers benefit to farmers as it provides most of their needs for their livelihood. A farmer from Chekrokejima village in 1938 cited "if you don't jhum you don't get enough rice to eat." Generally speaking, the Naga depend more on this form of cultivation than on gathered forest produce. They cultivate a diversity of food crops-paddy, maize, millet and job tears. Some pluses and certain varieties of mustard for oil, also sugar came, tubers such as potato and sweet potato, several vegetables including gourds, leafy greens and many herbs and spice plants are grown. They also grow the tall took palm (*Livistonajenkinsiana*), mainly for its betel-like fruit and for its leaves which are used as thatch and for hats (Strin and Ham, 2003: 19). The Forest Survey India Report, 2009, reported the main reason for the net decrease in forest in Nagaland is attributed to the practice of *jhum* cultivation. According to J.P. Mills(1931), "There has been little or no exploitation of forest, minerals or agricultural land, but the future cannot be held secure as long as the ruling of government stands that *Jhum* land, which the owner have bought or inherited as immovable property which can be validly held by an individual or clan, is all unclassed State Forest at the absolute disposal of government, on which there is no liability to pay compensation in the event of being taken over"[9]. G.D. Walker, also cited that with the growth of population *jhuming* continues to increase. Therefore, more funds will be necessary to induce people to take to wet cultivation with a view to preserve forest and to reduce flooding of the plains[10].

The Nagas' attachment to their natural resources was unfortunately compromised during the British regime through cunning techniques such as monetary compensation and bribes. Even for development activities within Nagaland viz., road

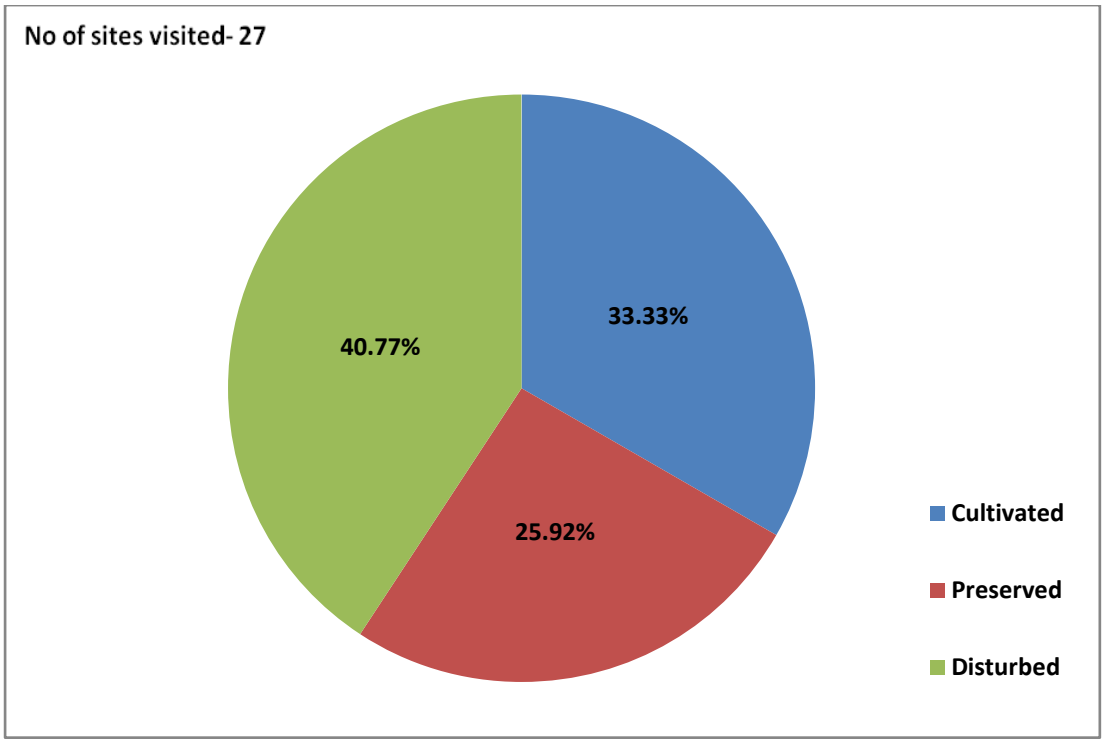
or bridge construction, Nagas' could avail compensation in recognition of their right and special status. Thus, for destruction to any resources in Nagaland, the British regime paid compensation which was recognized as 'Naga commission' during British regime. This was sort of a bribe in the name of 'Naga Commission' to minimize the attachment of the local peoples with their natural resources and to get vested work done without any hurdle. In modern Nagaland, if one community and thereafter, payment of money in the form of compensation, immediate reaction would be bribe to fulfill vested interest. Although the 'Constitution of India' did not accord the provision of the 'Naga Commission', sign of this practice exists even today, in the name of 'special status'. This has added in deterioration of Biological Diversity of the State of Nagaland (Ao *et al*., 2013: 181-82).

The felling of trees for fuel is one common factor. Wood is used as a cook fuel in most kitchens as a continuing custom. It is easily available, cheaper and less bothersome. A truckload of good firewood cost about Rs.25, 000/-(rupees twenty five thousand) which is sufficient to meet the fuel requirements of a large family. On the other hand, a family using LPG have to spend around Rs. 60,000/-(rupees sixty thousand) for the same. The cutting down of trees to use as post or pillars for building houses is also a common practice of the people. The State forest/groves are shrinking day by day. Dense sacred forests are fast becoming sparse and the sparse ones are getting converted into degraded wasteland. The main reason for this destruction has been the rapid decline in the traditional values system and the various demand of population growth which has obviously endorsed deforestation. Out of 27(Twenty Seven) Sacred Groves identified in the present study, 11(Eleven) is disturbed due to human interference- construction of roads, Recreation spot etc., 9(Nine) is under cultivation and only 7(Seven) is preserved (see Table 6: 1; figure 6.1) The religious beliefs associated with the sacred groves, and traditional beliefs contributing to forest protection could be suitably integrated with the modern scientific forest management practices, these sacred groves could become a very useful model for biodiversity conservation in the region. Evidently, there is a strong need to perpetuate and promote the concept of sacred groves, and to evolve a mechanism whereby the forest departments could provide technical inputs to improve the canopy cover and regeneration of trees in the degraded sacred groves of the region.

Table 6.1: Sacred Grove

Sl.No.	District	Name of Site	Status
1	Mokokchung	a) Jangjalong b) Yimchingkaba c) Ngazü d) Ngatibang	Gradual Decline Under Cultivation Under Cultivation Under Cultivation
2	Wokha	a) Mt. Tiyi b) Potsow lan c) Limyon d) Liko Emvu e) Ali Merum f) Sako- Selek	Gradual Decline Under Cultivation Disturbed Preserved Preserved Disturbed
3	Peren	a) Ihaingkicia b) Mt. Herapaitu c) Mt. Pauna	Disturbed Disturbed Disturbed
4	Zunhebhoto	a) Yemetsu Lhove b) Sungato	Preserved Disturbed
5	Tuensang	a) Khinuhanlu b) Pelungkechup c) Khaiknohanlu d) Wonoshiyeh e) Meiksuk-Ke f) Longkhunpit g) Asheru Long Khean h) Mihshe Jin i) Wohnu- ya j) Moyit Ke-chih k) Shih Yeanyung	Disturbed(Link Road) Preserved Under Cultivation Preserved Under Cultivation Preserved Disturbed(Link Road) Preserved Under Cultivation Disturbed(Link Road) Under Cultivation
6	Mon	Oloanu	Under Cultivation

Figure 6.1: Percentage on the status of Sacred Groves under study



The Nagas have always been conscious about the environment of their territories since time immemorial. Conservation of bio-resource, their judicious sustainable uses for present and future generation was consideredpertinent issues by the Naga communities in order to maintain unity and stop migration. Thus, aim was towards minimal destruction to natural habitat or resources. The Nagas attachment to their natural environment was unfortunately compromised during the British regime through crafty techniques as monetary compensation and bribes. Logging along with mining in some parts of Mon district boosted the economy of the people. Large forests under Naginimora and Wakching under Mon district were cut down in the early 1960s for logging purpose. The new business provided the villagers work to earn capital and sustain their livelihood along with other agricultural practices. The contractors, paid a royalty of rupees 30 (thirty) for one tree to the owner of the land and also link roads were constructed by the concern contractors for the transportation of the raw materials. However, there was so much corruption and inefficiency in the regulation of logging that this became a virtually unregulated activity. After concessionaires harvesting the trees from primary forest areas, they left logging roads and secondary forests behind. The locals, who lacked employment opportunities started to cut down secondary forests and practiced more extensively *jhum* cultivation[11].

The mining of coal at Tiru and Naginimora (see Figure 6.2) have destroyed large area of forest in Mon district (see Plate 6.1 and 6.2). The valley is being exploited locally to provide the needs of small scale industries in the region. Every

leaseholder or contractors were given directive to plant trees after the termination of the work[12]. But over the years, plantations were hardly done making the site barren[13].

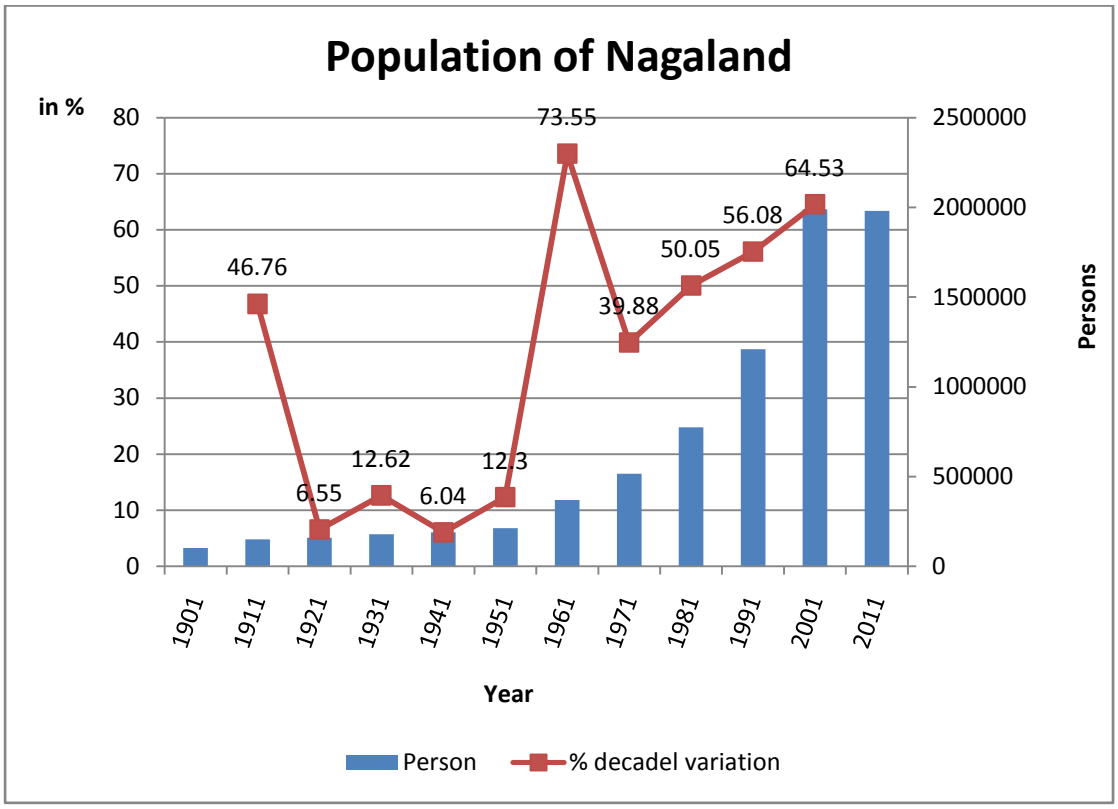
The population of Nagaland (see Table 6.2) was 212,975 according to 1951 census. Within a decade, the population growth increased to 73.55%. The census of every decade shows increase in population. The population in some decade was higher than that of the National percentage. The present population according to 2011 census is 1,990,602 person which is (-) 0.47 % decrease. Data on population show a strong inverse relationship with the forest cover (see Table 6.2 and Table 6.3). There can be other possible variables, but the data clearly indicates that with the growth of population the net area of forest decline.

Table 6.2: Population Trend from 1951-2011

Year	Person	%Decadal Variation
1951	212,975	
1961	369,200	(+)73.55
1971	516,449	(+)39.88
1981	774,930	(+)50.05
1991	1,209,546	(+)56.08
2001	1,990,036	(+)64.53
2011	1,990,602	(-)0.47

(Source: Statistical Handbook of Nagaland, 1988, 1996, 2009, 2010, 2012)

Figure 6.3: Bar Chart Representation of Population from 1951-2011



The data of forest cover reveals some fluctuating trends (see Table 6.3). Data from the Forest Survey from 1995-2001 shows a declining trend. The entire period from 1995-2001 is divided into three divisions i.e., 1995-1997, 1997-1999, 1999-2001. The period from 1995-2001 reveals a net decline of 127 Km² which is -2.03% approximately. 2001-2003 witnessed an increase in forest cover of 670 Km². The forest cover in between 2003-2005 declined with 1.08%. In 2005-2007 and 2007-2009 there was an increase of 0.6% and 0.45% respectively. During the period 2009-2011, there was decline of 146 Km² which is -0.04% annually (see Table 6.4). Thus, the Forest Survey data provide a clearer indication on the years where exactly the forest cover decreases over the period. Nagaland Land Use Land Cover (LULC) analysis 2005-2006 and 2011-2012 data also indicates the decrease in the forest covers of -162.23 Km² (see Table 6.5).

Table 6.3: Forest Cover 1995- 2011

Year	**Area in (Km²)**
1995	14,291
1997	14,221
1999	14,164
2001	13,345
2003	14,015
2005	13,119
2007	13,327
2009	13,464
2011	13,318

(Source: Forest Survey of India and Statistical Hand book of Nagaland)

Figure 6.4: Bar chart representation of Forest cover between 1995-2011

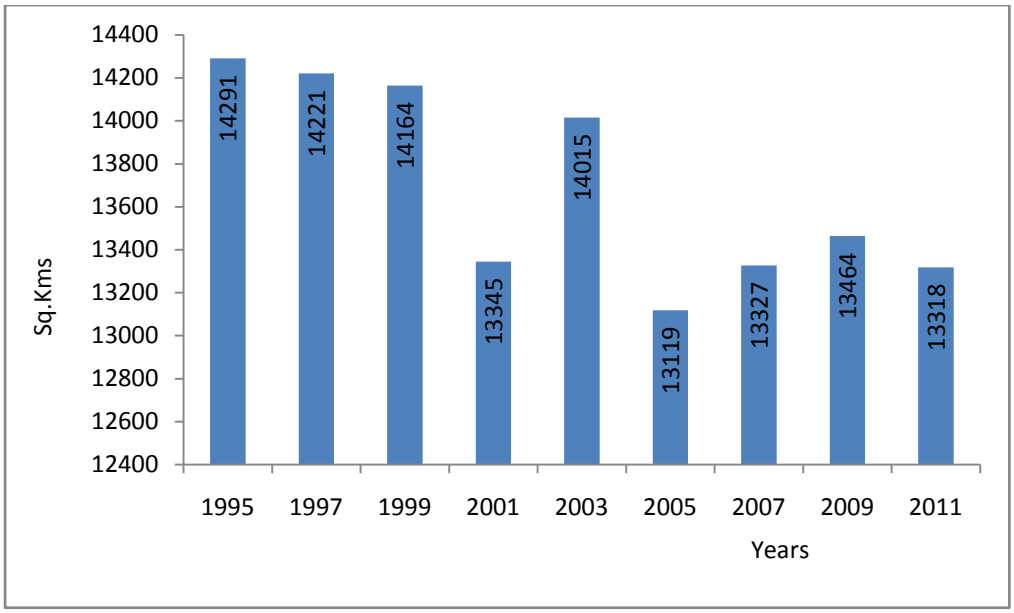


Table 6.4: Percent Annual Change in Forest Cover between 1995-2011

Year	1995-97	1997-99	1999-01	2001-03	2003-05	2005-07	2007-09	2009-11
Annual Change (in %)	-0.25	-0.20	-2.73	2.23	-1.08	0.69	0.45	-0.49

According to Nagaland Land Use Land Cover Analysis (LULC) 2005-06 and 2011-12, there is decrease of -21.76 hectares in agricultural land and shifting cultivation. However, the area of forest change/ use has increased to -162.24 hectares (see Table 6.5). The satellite image (see Figure 6.5) clearly indicates the Land Use Land Cover of the region 2011-2012. Also see Figure 6.6for the forest cover of the State.

Table 6.5: LULC Change Analysis 2005-2006 and 2011-2012

	2005-06	2011-12	Change
Agricultural Land	594.42	572.66	-21.76
Shifting Cultivation (Current)	1150.07	1053.26	-96.80
Shifting Cultivation (Abandoned)*	1660.27	1797.60	137.33
Forest	10555.87	10393.63	-162.24

*not in use for more than one year. (Source: Nagaland Science and Technology Council, Kohima)

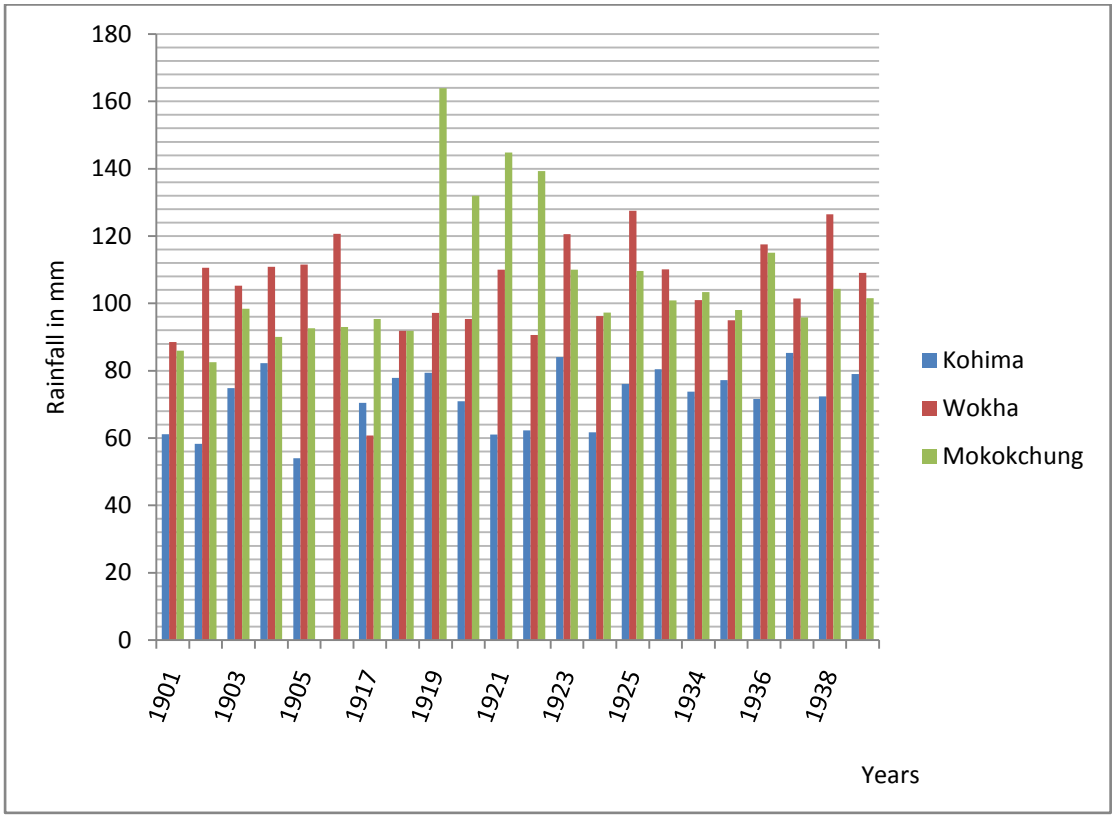
Over the years, there has been fluctuation in the rainfall. The data's of rainfall during the colonial period (see Table 6.6) from 1901-1939 clearly indicates the difference in rainfall in three major districts viz. Kohima, Mokokchung and Wokha. With the preceding years the rainfall data shows decrease in rainfall (see Table 6.6 and Figure 6.7). Mokokchung in 1901-02, owing to the deficient rainfall during March, April, May and June the seeds did not germinate on the new cultivation leading to poor crops[14].

Table 6.6: Rainfall in (mm) during Colonial Period: 1901-1905, 1921-1925, and 1935-1939

Year	**Average rainfall (mm)**		
	Kohima	**Mokokchung**	**Wokha**
1901	61.12	85.96	88.51
1902	58.27	82.53	110.55
1903	74.87	98.46	105.30
1904	82.29	90.09	110.86
1905	54	92.57	111.6
1921	61.08	144.8	110.02
1922	62.24	139.3	90.6
1923	84.03	110.05	120.6
1924	61.73	97.24	96.3
1925	76.08	109.6	127.5
1935	77.24	98	94.9
1936	71.60	115.07	117.5
1937	85.33	95.9	101.5
1938	72.32	104.3	126.4
1939	78.98	101.58	109.1

(Source: General Administrative Report of the Naga Hills: File No. 332, 340, 341, 347, 349, 352, 354, and 664).

Figure 6.7: Bar-Chart representation of Rainfall in (mm) during Colonial Period between1901-1905, 1921-1925, and 1935-1939



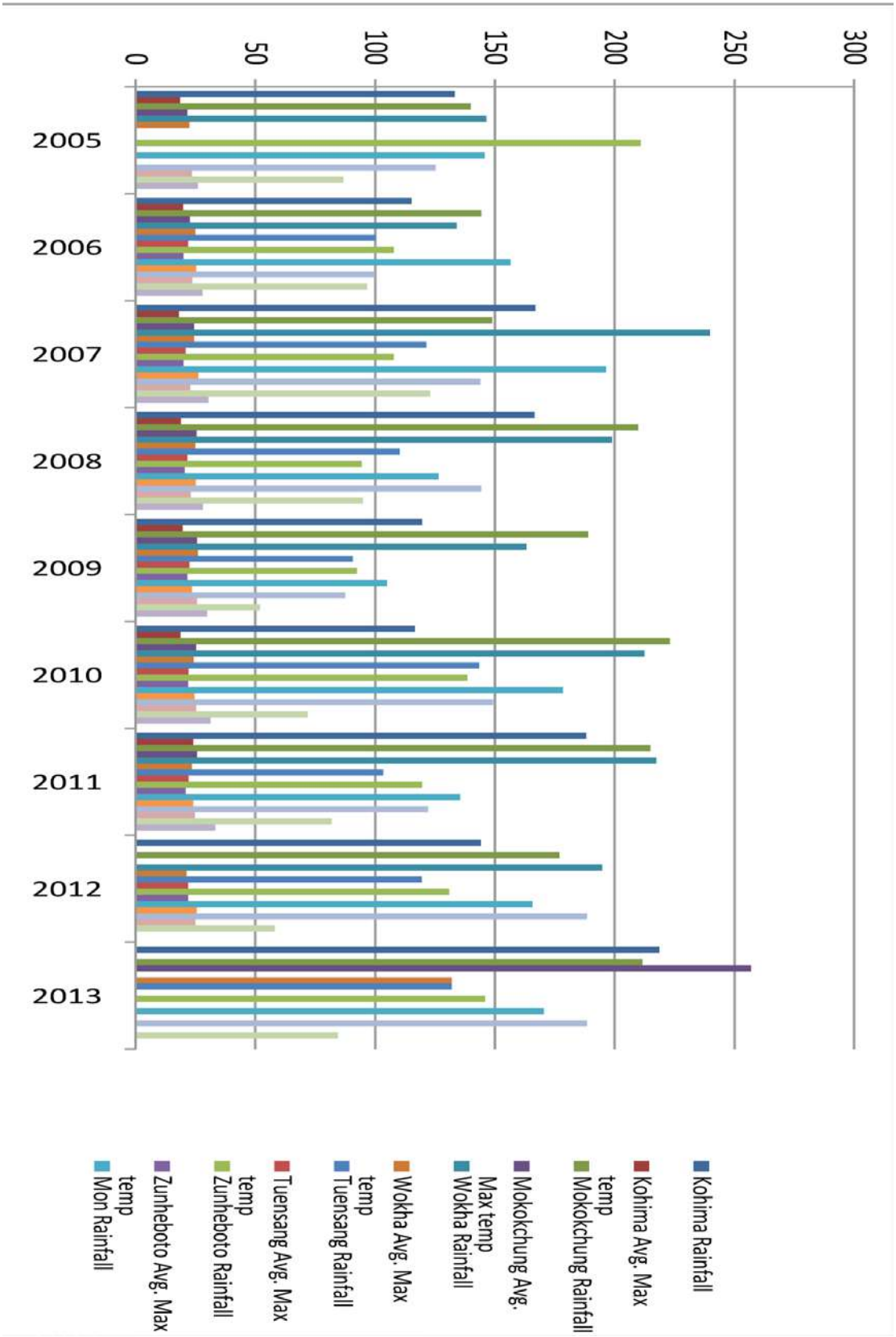
The region shows certain marked differences in terms of its changes of temperature record (2005-2013) in some of the district. Out of the eight (8) district rainfall and temperature records, six (6) districts viz. Dimapur, Kohima, Mokokchung, Phek, Wokha and Zunheboto shows rise in temperature with Dimapur district making a record of gradual rise for the past three (3) years. In most of the years, rainfall shows a fluctuating rate (see Table 6.7 and Figure 6.8).

Table 6.7: Rainfall Data (in mm) and Average Maximum Temperature (in °C) from 2005-2013

Year	District	Rainfall	Avg. max. temp
2005	Kohima	133.2	18.6
	Mokokchung	140	21.5
	Wokha	146.4	22.5
	Tuensang		
	zunheboto	210.8	
	Mon	145.7	
	Phek	125.3	23.5
	Dimapur	86.8	25.9
2006	Kohima	115.2	19.8
	Mokokchung	144.3	22.6
	Wokha	134.2	24.9
	Tuensang	100.3	21.95
	zunheboto	107.8	19.9
	Mon	156.5	25.3
	Phek	99.9	23.7
	Dimapur	96.7	27.9
2007	Kohima	166.9	18
	Mokokchung	149	24.3
	Wokha	239.8	24.4
	Tuensang	121.5	20.86
	zunheboto	107.8	19.9
	Mon	196.5	26.2
	Phek	144	22.8
	Dimapur	123	30.3
2008	Kohima	166.6	18.9
	Mokokchung	209.9	25.4
	Wokha	198.9	24.9
	Tuensang	110.3	21.45
	zunheboto	94.4	20.5
	Mon	126.5	25
	Phek	144.3	23
	Dimapur	94.9	28.11
2009	Kohima	119.7	19.6
	Mokokchung	189	25.5
	Wokha	163.3	26
	Tuensang	90.74	22.4
	zunheboto	92.4	21.5
	Mon	105	23.4
	Phek	87.5	25.5
	Dimapur	51.9	29.9
	Kohima	116.7	18.7
	Mokokchung	223	25.2
	Wokha	212.5	24.2
2010	Tuensang	143.5	22.01
	zunheboto	138.5	21.8
	Mon	178.4	24.6
	Phek	149.3	25.2
	Dimapur	71.9	31.3
2011	Kohima	188.2	24
	Mokokchung	215	25.5
	Wokha	217.4	23.4
	Tuensang	103.5	22.01
	zunheboto	119.6	20.9
	Mon	135.6	24
	Phek	122.1	24.7
	Dimapur	81.8	33.1
2012	Kohima	144.2	
	Mokokchung	177	
	Wokha	194.8	21.2
	Tuensang	119.4	21.93
	zunheboto	130.9	21.8
	Mon	165.7	25.4
	Phek	188.4	24.9
	Dimapur	58	
2013	Kohima	218.6	
	Mokokchung	211.6	
	Wokha	257	
	Tuensang	132	
	zunheboto	146	
	Mon	170.5	
	Phek	188.4	
	Dimapur	84.5	

(source: Meteorological Report, Directorate of Soil and Water Conservation, Kohima)

Figure 6.8: Bar-Chart representation of Rainfall Data (in mm) and Average Maximum Temperature (in °C) from 2005-2013



The jungle/forest burning (see Table 6.8) carried out during dry and windy months of March and April were uncontrollable and burnt down large areas of jungles even where plantations were not intended to be carried out. Also, plantation activities were carried out at different times depending on the convenience of the owners and hence jungle fires became a regular affair for years together. These regular annual infernos soon signed the entire hill slope almost bare from vegetation.

Table 6.8: Jungle/ Forest Fire

District	**Year**		
	2009	**2010**	**2011**
Kohima	20	28	03
Dimapur	10	-	-
Mokokchung	14	02	01
Tuensang	04	-	-
Wokha	07	02	-
Zunheboto	02	02	-
Mon	04	02	-
Phek	-	03	05

(Source: Statistical Hand book of Nagaland, 2013)

Agriculture is the main economic backbone of the people and is the largest employer of the work force in the villages. The practice of shifting cultivation/ *jhum* is deeply rooted in the Naga psyche, having evolved through the years and being rooted in customs, beliefs and folklore. In fact, from the day farmers starts clearing the jungle till the harvesting, every season is followed by festivals. Traditional *jhum* influences the Naga mindset. It influences the cultural ethos of its agrarian society and social fabric. For the Naga farmers, *jhum* is much more a form of sustenance; it reflects the 'reason' for their existence (NEPED). *Jhum* cultivation certainly is not environment friendly but considering it as unscientific way of land use and calling for removing it from the land is unethical. Population pressure on agricultural land and narrowing down of *jhum* cultivation is a problem for many villages though in some villages *jhum* cycle is increasing due to adaptation of settled agriculture and migration of villagers to town (Table 6.9).

All the seven prominent villages under the present study practices *jhum* cultivation showing unique characteristics. In Tuensang District Kuthur, Chessor and Sotokor villagers are mostly dependent on *jhum*. Dependency on *jhum* is increasing as they have very limited scope for alternative cultivation. As a result *jhum* cycle is decreasing in the village. The present jhum cycle is 10-15 years at Kuthur, 8-12 at Chessor and 9-15 at Sotokor. The people of Waromung village under Mokokchung District practice both *jhum* and terrace cultivation with jhum cultivation more extensively. The villagers could maintain their *jhum* cycle at an average of 9-12 years.

There are few reasons to this. Notable among them are, huge forest areas under its jurisdiction, converting *jhum* land into cash crop cultivation, migration of people, decreasing household and population of the village. Mishilimi village under Zunheboto District practice both *jhum* and terrace cultivation with *jhum* cycle of 8-10 years. The village has two wildlife reserve area—Kivine and Ghabo which is protected by the village council. The *jhum* cycle of Wakching village of Mon District is 6-8 years. Rice, yam and maize are some important agricultural crops. Apart from *jhum* the people are engaged in logging and mining of coal. The *jhum* cycle of N. Longidang village under Wokha District which was only 8years has increased to 10 years because of the changes in land use pattern. Farmers have started intensive cash crop farming. As a result, there is reduction of area under *jhum*. Orange, litchi and passion fruits are some common cash crop of the farmers. All the villages has a reserved forest looked after by the village council. Hunting and collection of forest wealth is strictly prohibited in the reserved area but the people can do so in their private, clan or individual land.

Table 6.9: Brief Profile of some selected village of the study area

Sl. No	District	Number of household	Nature of Cultivation	Jhum Cycle	Status of Jhum Cycle	Presence of reserved Forest
1	Tuensang					
	a) Kuthur	603	Jhum	10-15 years	Decreasing	yes
	b) Chessor	820	Jhum/terrace	8-12 year	Decreasing	yes
	c) Sotokor	1134	Jhum	9-15 years	Decreasing	yes
2	Mokokchung (Waromung)	538	Jhum/terrace	9-12 years	Constant	yes
3	Zunhebhoto (Mishilimi)	860	Jhum	8-10 years	Increasing	yes
4	Mon (Wakching)	743	Jhum	6-8 years	Decreasing	yes
5	Wokha (N. Longidang)	540	Jhum	8-10 years	Increasing	yes

End Note

1. Annual Administration Report of the Naga Hills District for the Year 1922-23.
2. Ibid.
3. Administrative Report of the Naga Hills for the Year 1924-25.
4. Ibid.
5. General Administration Report of the Naga Hills 1936-37.
6. Extracts from the Tour Diary of E.I.D. Lambart, Deputy Commissioner, Naga Hills, 9th March, 1938.
7. Ibid.
8. Note on the contact on the tribes of the Naga Hills District on contact with civilization 1942.
9. J. P. Mills, Deputy Commissioner Naga Hills. Note on the contact on the tribes of the Naga Hills District on contact with civilization. 15/05/1931.
10. G. D. Walker. (1910). Commissioner, Surma Valley & Hill Division.
11. As told by C. Nyangpong, 62 years; Wakching Town under Mon district during an interview conducted at his residence on07/05/2014.
12. According to Mining Operation Rule, Chapter-IV Clause (xii)—Every leaseholder shall take immediate measures for planting in the area held under the lease or any other area selected by the State Government in such a manner so as to cause least damage to the flora of the area held under mining lease and the nearby areas.
13. As told by Henpong, 45 years, Coal Contractor and Village Council Chairman; Wakching Village under Mon district during an interview conducted at his residence on07/05/2014.
14. Annual Administration Report of the Naga Hills for the Year 1901-02.

Chapter7

DISCUSSION AND CONCLUSION

Forest occupies an important place among the Nagas. The forest and the Nagas both have inseparable relationship to each other. The Naga history reveals that the Nagas lived in tune with the natural surroundings. The ancestral territories of the Nagas were not just their economic base; these lands were intimately bound up with their cosmologies and identities as communities, and as peoples. This land holding has been an ancestral trust which is handed down the generation. This symbiotic relationship of the people with forest indicates that historical roots are strongly embedded with their land. The forest and its resources therefore, formed the basis of all forms of communal cultural practices, their economy and even inter-tribal territorial warfare and conflicts in the Naga Hills.

One of the reasons for gradual disappearance of forest over the years can be attributed to logging. There is so much corruption and inefficiency in the regulation of logging that this became a virtually unregulated activity. After the order by the Supreme Court in December 1996, logging at least in papers had stopped. However, logging activities seem to continue in the region. This issue cannot be ignored when discussion on forest lost is considered. The village Council, the main authority in a village has no voice for this as the concern logger/contractors harvest the trees from their individual land or buys from those members in the village who owns their own forest. In some cases, the village council offers contract for logging in the village reserve forest. Logging business provides the villagers work to earn and sustain their livelihood along with agricultural practices. They are not cutting down the trees illegally as they are harvesting from their land. However, they cannot generally operate without the tacit complicity of Forest Department in the State. Cutting of trees can be done without the knowledge of the Forest Department but for the transportation, the logs have to pass through many forest check points. Generally speaking, there is unseen factor that makes a short-term profit from this trade acting as middlemen. The Forest Department as a part of State government have the right to

raise this issue; or, is it too difficulta task to raise this thorny/barbed issue with powerful bureaucrats? This can be a high sensitive political issue if questions on logging are to be raised. Who is to be blamed for all this activities?

The issue of climate change in the State can also relate to deforestation. Small scale deforestation is likely to result in less net surface radiation, less evaporation, less rainfall and warmer surface temperature (see Eltahir and Rafael, 1994: 113). Rain-rate decreases asdeforestation increases (Gupta *et al*., 2005:103).most research conducted on deforestation around the world suggests that there would be a reduction in local evapotranspiration and rainfall (see Costa & Foley, 2000), although some studies indicate that if there is only small-scale or sporadic deforestation, then local rainfall could be increased (see Berbet & Costa, 2003; Snyder*et al*., 2004b). However, with number of studies that have modelled the impact of deforestation, one can conclude that rainfall and temperature has a relation with deforestation. Recent field observations from the Amazon region confirmed that conversion of land cover from rain forests to ranch land increases surface albedo and reduces evaporation rates (see Bastable *et al*., 1993; Wright *et al*., 1992). These local impacts modify the energy balance at the land-atmosphere boundary and potentially result in regional climate change. Several studies also focused on the impact of tropical deforestation on land surface processes and climate. Dickinson and Henderson-Sellers (1988), Lean and Warrilow (1989), Nobre *et al*. (1991) and Dickinson and Kennedy (1992) performed numerical experiments using general circulation models (GCMs) to simulate the impact on climate due to deforestation in the Amazon basin. Most of these studies predict that large-scale deforestation will result in the following regional climatic changes, warmer surface temperature, less evaporation, and less rainfall.

Though it is very difficult to give a final statement of climate change in the region there are certain marked instances which make even a lay person to worry about the manifestations of climate change in the region. The region shows certain marked differences in terms of its changes of temperature record in some of the district. Out of the eight (8) district rainfall and temperature records, six (6) districts viz. Dimapur, Kohima, Mokokchung, Phek, Wokha and Zunheboto shows rise in temperature with Dimapur district making a record of gradual rise for the past three (3) years. In most of the years, rainfall shows a fluctuating rate. The fluctuations of temperature and the increase to it in most of the districts in the region are some of the

indications of impact of climate change in the region. Besides this there are various changes which make it clear that the equation of man and environment in the region is equally at risk considering the destruction of forest and shrinkage of genetic resources. While the region continues to be perceived by outsiders as full of greenery and thick forest cover, a look into the forest statistics talks about the dismal reality about the region. This gives a ready reference of manifestation of climate change in the State.

The degradation of environment can be observed in shrinkage of forest cover and demographic expansion. Nagaland, over the years has experienced gradual increase in population.Although there is decrease in the population according to the latest census, the growth of human population throughout the past decades had played a major role in the depletion of the forest. The declining trend of population growth rate according to 2011 census was –0.47%, which is just a decrease of 576 people within a decade (see Table 6.2) while deforestation was occurring at high rate. The forests are the best place to accommodate the growing pressure of additional populace. According to the census statistics, the population density in the state grew by approximately 50% between 1951-2001.During the period 2009-2011, there was decline of 146 km² which is -0.04% annually. Nagaland Land Use Land Cover (LULC) analysis 2005-2006 and 2011-2012 data also indicates the decrease in the forest covers of -162.23 km².Therefore, it is tempting to argue that decline in the forest cover is principally a response to growth of population density. An inverse relationship between population and forest area had been recognized by the forest sector since two centuries or more (Mather and Needle, 2000: 2-13). Allen and Barnes (1985) found from their studies that deforestation was significantly related to the rate of population growth in 39 countries in Africa, Latin America, and Asia over the period 1968-78, and opined that population may be ascribed as a primary driver of deforestation in the developing world. Similar conclusion was drawn by Harrison (1992) that population growth was responsible for 79 percent of global deforestation between 1973 and 1988, while Palo and Lehto (1996) described population pressure as one of the universal underlying causes of pan-tropical deforestation. Alves and Hogan (2009) observed a positive association between population size and deforestation in Ribeira valley; studies conducted by Cropper and Griffiths (1994); Geist and Lambin (2002) also led to the same conclusion.

Forest fire is also considered a frequent and constant natural disaster in the forest ecosystems. The slash-and-burn cultivation, or locally known as *jhum* (*Tekong lu-* in Ao meaning 'dry fields'; *Thulu-* in Yimchungru meaning 'precious land'; *Hapho li-* in Lotha meaning 'cleared field') is the predominant form of agriculture in the region is found to be the major cause of forest fire in the region. The fire in northeast India mostly pertains to slash and burn agriculture (Ramakrishnan, 1988; Majumder *et al*., 2011). Most of the fire incidents in the region are anthropogenic in nature. All the seven prominent villages under the present study practices *jhum* cultivation, with *jhum*cycle of 8-15 years approximately. Only 1(one) village maintain a constant *jhum* cycle while, 2(two) village the cycle has increased and 4(four) villages shows a decreased status. This clearly indicates that *jhum* is rooted in the Naga psyche. Traditionally, *jhum* cultivation was sustainable. However, the increasing population has led to a shortened *jhum* cycle in some of the villages. A possible alternative to *jhum* cultivation is terrace/wet cultivation. But this too, has its limitation because extensive parts of the State are too hilly for economic use of terracing. Farmers therefore, cut down more primary forest for their food needs (see Kevichüsa, 1999). Moreover, the traditional influences on *jhum* still influence the Naga. Apart from *jhum* field fires, jungle/forest burning during the dry months is a traditional practice among the tribes in the region. Statistical Hand book of Nagaland, 2013 (see Figure 6.8), in the year 2011, there was 3(three) jungle fire in Kohima District; 1(one) in Mokokchung District and 5(five) in Phek District. Mao and Gogoi (2007) cited that, during the recent past, the natural forest of the Dzükou valley, around 30kms from Kohima District is being destroyed extensively by forest fire because of human intervention. All these have resulted in the rapid depletion of the rich flora ofthe area. The populations of several species are also facing threat to survival in their natural habitats, while a few are already on the verge of extinction. *The Telegraph*, February 2012, reported jungle fire at Dzükou valley, "The destruction comes at the time when the State was mulling ways to reduce damage to the eco-system in order to avert disaster because of climate change." Dzükou valley is a sanctuary for endangered tragopans and other species of birds and animals.

The practices of setting up new villages also impact the forest cover in the State. Waromung village under Mokokchung District having 538 household, is under the process of setting up a new village. The main reason behind this is, at the present

village site there is no enough fertile land for cultivation. Moreover, the new site is near the bank of river Milak, which will offer a good source for sustenance. Langa village was established in 2004 from the parent village- Kuthur village and was recognized by the State Government in 2014. The new village was formed in order to preserve the ancestral site of the Yimchungrü (personal comm.: Throngso Yimchunger, 2014). Mimi village, under Kiphire District, shifting and setting up of village is done frequently. One reason is to have an administrative headquarter. When many villages are formed in the area, the government will established administrative headquarter which will generate developments in the area. Another reason is, by shifting to a new area and establishing of new villages ensures the probability of avoiding land disputes and to take control of the natural resources of the area for which they claim (personal comm.: Tiatoshi Jamir, 2014). This shifting and establishment of new villages indirectly led to the depletion of the forest area.

Fuel wood is a primary source of energy for domestic purpose among the tribal population of North-East India and its use has been a major cause of deforestation (see Maikhuri, 1991). In Nagaland, increased demand for fuel wood for household consumption is a primary driver of forest loss. While non-wood fuels and appliances are also used for household consumption of energy in the State, fuel wood is the only important source of energy in most villages, especially in rural Nagaland. There are both socio-economic and socio-cultural factors that explain this pattern of energy consumption among the Nagas. From a socio-economic stand point, due to the poor socio-economic conditions of the majority of the villagers, as well as the unlimited supply and lack of transportation facilities for LPG into the rural villages, the commercial source of energy is generally beyond the reach of ordinary people. Therefore, the majority of the rural population depends on the forest for their fuel requirement. Fuel wood is an important component in the traditional life of the rural areas in Nagaland. For a Naga, keeping piles of fire wood at home is a matter of prestige and a part of material wealth especially in the urban areas. Every Naga kitchen is adorned with a fireplace (hearth). Buying a truck load or cutting down of fire wood from their own land is a yearly routine for most of the Naga family. However, there is a significant difference between rural and urban consumption of fire wood. The availability and affordability of LPG in urban area make the necessary consumption of wood for fuel optional. In urban area, the consumption of wood for

fuel is practiced more as a matter of tradition than necessity. This is unlike consumers of fire wood in the rural area where LPG is unavailable and unaffordable, and so the consumptions of fuel wood for energy become necessity. Therefore in rural area both traditional and necessity influence the practice of consuming fire wood. Hence, demand for fire wood will not decrease in the region due to the demand of fuel wood in urban areas and the need for fuel wood as a routine way of life in the rural areas.

The annexation of the Naga Hills into the British Indian system of administration and the implementation of the Assam Forest Regulation of 1891 disturbed the normal lives of the people. The successive laws and regulations imposed in the development and growth of the state resulted in undermining indigenous way of life. The British administration followed policy of establishing jurisdiction over the forest to achieve economic returns. Unlike other tribal's, for the Nagas, hunting, gathering and *jhuming* remained the solitary means of resource relying entirely on indigenous knowledge, completely free from external influences. The customary rights of the people over the forest and its products existed in the Naga Hills district determined the colonial steps for conservation and forestry regulation.

The conservation and forest regulations of the colonial government started with the establishment of an all India Forest department in 1865. It was later extended to Assam and Naga- Hill district. This initiation led to measures covering all aspects of the environment including forests, land, and even water. Successive statute laws and state control imposed in the arena of forest reinforced development and growth of an intrusive state thereby undermining indigenous and community based systems of management over its resources. However, there were major contradictions in the colonial initiative at forest conservation in the Naga Hills. While under the colonial period significant efforts were made to conserve forest, there were instances when the British Government moved to deforest large areas of forest reserves. For example, there was in 1896 official move to deforest the Diphu Reserve and a portion of the Nambar Reserve by implementing the "Proposal of Deforestation," (after Gait, 1896). These colonial moves at deforestation were mainly to address the growing demand in Naga villages for land for agricultural cultivation. But it gave official support to the traditional slash-and-burn agriculture method known as *Jhum* cultivation. At the same time, it highlighted in Nagaland the early stage of the universal conflict between economic expediency and environmental conservation.

Another issue in Nagaland's historical development which contributed to difficulties in the implementation of forest conservation projects at the State level is the pattern of landownership in Nagaland. After Nagaland became a State in 1963, the transition from community ownership to private ownership or privatization became an important problem for the implementation of legislations and community programmes aimed at forest conservation in Nagaland. The British administration enforced the rupee as the currency for economic activity and a system of structured tribal government that was very different than historic social governance practices. These development triggered social changes among the Nagas (see Chasie, 2005). The Naga villagers started to sell their lands as exorbitant prices were offered to communities for their land. Population pressure also played a role in the clamor for land leading to conflicts between villages, clans, or individual. At the departure of the colonial government, some landownership issues were left unsettled. This created a situation where both the post-colonial government and the Naga villagers claiming the land under their jurisdiction.

The private landownership pattern which emerged in Nagaland has hindered the implementation of forest conservation laws. Forest laws passed at the State level could not be effectively implemented because the State government owned only 11.7% of the forest land while individual community owns 88.3%. For instance, the State government has strong legislation for coal mining, like the compulsory planting of trees after the termination of coal-mining activities, but coal contractors are able to ignore these laws with the support of private landowners. Attempts to implement forest conservation programmes developed by the forest department stalled at the village level because of lack of cooperation in villages where individuals who owned the land refused to participate in such forest conservation programmes.

Nonetheless, the divergence between environmental conservation and economic expediency in the era of modernism plays out in Nagaland. People cannot be blamed for destruction of forest when their survival mainly depends on agricultural cultivation. In Nagaland the people depend almost solely on agriculture for their livelihood. There is no substitution for *jhum* or terrace cultivation without harming the forest. To limit or prevent the people's occupation in agriculture means the intensification of economic problems of survival at the community and family levels

among people already living at a poor and subsistent economic level. Therefore, it appears that deforestation for cultivation cannot be avoided.

Although it is not feasible to stop *jhuming* overnight, in an attempt to reduce deforestation, measures must be taken to check soil erosion and enhance agricultural productivity as well as to reduce the people's dependence on *jhuming*,while at the same time improve the people's economic condition. In order to uplift the economic condition of the people and save the forest, alternative sources of livelihood can be developed. Also modern and scientific methods of cultivation must increase to the productivity in agriculture. Nagaland Environment Protection and Economic Development (NEPED) has broadly reached down to the grassroots levels, with large share of project benefits going to the farmers serving as a catalyst for the State Government to help encourage and spread ideas and project management and implementation. One good instance is the Alder-based *Jhum* System at Khonoma village under Kohima district; alder (*Alnus nepalensis* D Don) [1] trees naturally grows in most parts of Nagaland. The system is extremely important as it provides at least 57 food crops to supplement the rice grown in the nearby Wet Terrace Rice Cultivation (WTRC), which is not possible to grow these cereals and leafy vegetables in the WTRC. The alder tree has root nodules which improves soil fertility by fixing atmospheric nitrogen to the soil. It also enhances crop yields and reduces soil erosion. Normally, a *jhum* farmer cultivates the field for two years within a nine-year cycle (1:4 ratio of cropping to fallow). But the alder system allows two harvests in two out of every four to five years (1:1 ratio of cropping to fallow) (Yaden,1999:28). The farmers of Khonoma village have developed the alder-based *jhum* system to a high level of sophistication. Farmers from other parts of the State can benefit from this developed and proven approach.

One can also take good example of a successful local indigenous approach to combining forest conservation with socio-economic development in the rural villages. The village of Hakkomute, Mimi region of Kiphire District, the greater part of the land is under the control of the Village Council. And at the same, families own small plots of land which are inadequate for cultivation at an economically sustainable level for their livelihood. The Village Council has developed a plan of land distribution among the families for cultivation whereby it can monitor and control forest conservation and at the same time enhance family food production in the village.

Through this plan the village Council is able to monitor the land distribution to families and ensure that proper land conservation methods are practiced in cultivation. It also ensures that forest conservation is maintained over the rest of the land after distribution under its control so that the future generation can also avail the benefits (personal comm.: Tiatoshi Jamir, 2014).

Another innovative attempt to conserve forest while enhancing the economic livelihood of the people of Nagaland is a plan initiated by the Nagaland Bamboo Development Agency (NBDA) to convert biomass into energy. At the same time,it also promotes bamboo plantation on a massive scale. A Naga starts life in a cradle of bamboo and ends in a cradle of bamboo shows how deep his attachment to this plant bamboo is (see Ao, 1968). When the bamboo flowers, it leads to the subsequent death of the bamboo and population explosion of rats. Bamboo flowering (*Ashi* in Ao dialect) affected vast bamboo groves in many parts of Mokokchung district in the early 1960s. The bamboo flowering resulted in increase of rats population; destroyed fields leading to famine. It is said that in many villages the people relied on wild potatoes for the survival. This was regarded as an impending natural disaster as bamboo that has flowered was not considered useful because it lacked quality (personal comm..: Panger, 2013). However, there is a possibility to convert this resource to charcoal, which can be used for energy, and marketed to improve local livelihoods. It is difficult to assign an exact economic value, since bamboo growing supports various sectors, which include agriculture, crafts, construction and industry. A recent study suggests that the existence of bamboo that has flowered has resulted in a loss of approximately US$ 2.04 million in Nagaland state (North East State Forest Department report, 2009). In view of this Nagaland Bamboo Development Agency (NBDA) initiated a plan to convert biomass into energy at one level and at the same time promote bamboo plantation on a massive scale, mostly in areas where the bamboo had flowered, to help regenerate about 14142 hectares of bamboo forests, over a period of five years (2007–2012). During this time, approximately, 0.31 million tones of biomass has been regenerated and about 0.17 tones of CO_2/year has been sequestered by these measures. NBDA initiatives clearly demonstrate how a strategic institutional approach can transform and revive community oriented activities to improve quality of life and at the same time provide useful lessons to policy makers, particularly in reducing natural disaster related impacts[2].Similar

sustained, innovative means of reorganizing institutions that are sensitive to local needs and above all the creation of awareness at all levels would help ensure ecological and economic security at the local level.

Studies on rainfall and the temperature regimes of the State indicate that there is significant trend towards decline in rainfall for the State as a whole. The immediate neighbour state of Nagaland, southern part of Nagaon district in central Assam valley and adjoining parts of Karbi Anglong form a rain-shadow zone where annual rainfall is as low as 800-1200 mm. Water scarcities are a potential constraint for the people living in this rain shadow zone and absence of effective irrigation systems or water harvesting practices adds to the vulnerability of the people. But what is of immediate concern is that rainfall in this zone is decreasing slowly as found in Lumding where rainfall is on the decline at a rate of 2.15 mm per year. As a result water crisis might aggravate in this region in the coming years[3]. The impacts of climate change on regions like Nagaland are less explored and less known till now making the future scenarios more uncertain for vulnerability assessment and risk management. However, certain indicators point to impacts being already visible in the region. Analyzing the rainfall data over the years, the State of Nagaland too might experience water crises in near future. According to (Venkatachary*et al*, 2001: 377) a vast area of 508, 000 hectares in Nagaland has been affected by erosion.

The relationships among population growth, culture, socio-economic factors, politics and biology are complex; this makes the prevention of biodiversity loss an extraordinarily difficult undertaking. Such efforts are not helped by reports, based on inadequate quantitative data, or based on incomplete pictures of the structure and function of ecosystems, alleging the ecologically-benign nature. More holistic studies that relate "kind(s) of biodiversity" to productive, protective and other ecological service functions are urgently needed. For instance, Diamond (2005) uses the example of Easter Island to illustrate how deforestation can lead to societal collapse. Environmental security and sustainability of the region are and will be greatly challenged by these impacts.

Sacred groves were preserved by the people without any law imposed on them as they believe in certain traditional values. The locales believe that deities, spirits or malevolent god(s), who is the creator of the universe, resides in the groves. People do

not harm sacred groves mainly because of its attachment to socio-religious traditions and fear of the unknown. To venture or cultivate the grove, the people have to offer sacrifice tothe presiding deity/spirit/god. For instance, a site Muksuk-ke at Chessor village, a pig sacrifice is done if the site is to be cultivated; at another site Wohnu-ya, Sutokor village, rituals are performed for a sick person with some ginger and rice. Naga ancestors held reverential attitude towards nature and its all life forms wherein sacred groves are the potent symbol of the same. People cherish sanctity of life through conservation of biodiversity. This ecological philosophy is a potent tool to avert any crises in the society. They are not only the sacred ecosystems functioning as a rich repository of nature's unique biodiversity, but also a product of this philosophy of nature that the Nagas have been cherishing since ages. Out of the 27(twenty seven) sacred groves identified, only 7(seven) appears to be preserved. This shows that the traditional values associated with the forest are slowly eroding. One reason for this is the acceptance of the new Christian faith. Sacred groves do not just help conserve valuable biodiversity, soil and water, but are also critical in regulating weather and climate cycles so vital for life to blossom and flourish on the planet. With the degradation of the environment, especially forest, a large number of rare, endangered, threatened and other taxonomically and ecologically important plants and animal species are disappearing. A Pochury hunter who correspondedto the local daily *The Morung Express* on 23rd January 2011 remarks that "a variety of animals and birds like elephants,…and peacocks could be spotted in the forest. They are no longer visible. Moreover, several water sources have also dried up".One of the facts that makes sacred forests such an important factor in conservation is that it promotes not just the protection but of every possible element of habitats. The sacred forest/groves of the world are shrinking day by day. Dense sacred forests are fast becoming sparse and the sparse ones are getting converted into degraded wasteland. The main reason for this destruction has been the rapid decline in the traditional values system and the various demand of population growth which has obviously endorsed deforestation (Lucy and Zehol, 2009: 36). Unfortunately, in the case of a relatively small state like Nagaland, there are signs indicating the change in the scared groves. The groves had and are fast eroding. If the religious beliefs associated with the sacred groves and traditional wisdom contributing to forest protection could be suitably integrated with the modern scientific forest management practices, these sacred groves could become a very useful model for biodiversity conservation in the region. Evidently, there is a

strong need to perpetuate and promote the concept of sacred groves, and to evolve a mechanism whereby the forest departments could provide technical inputs to improve the canopy cover and regeneration of trees in the degraded sacred groves of the region (Tripathi, 2005: 3).

In India, many Acts are enacted for conservation of Biological Diversity such as- Indian Forest Act, 1927, Wildlife(Protection) Act, 1972, Forest(Conservation) Act, 1980, Protection of Plants varies and Farmers Right, 2001 and the Schedule Tribe and other Forest Dwellers (Recognition of Forest Rights) Act, 2006. The legislative Assembly of Nagaland, understanding the need to conserve the forest resources and protect the rights and interests of the various tribes/ communities and individuals has enacted a series of local Acts/ Rules to conserve and protect the forest viz., The Nagaland Forest Act, 1968; the Nagaland Rule for protection of the Establishment and Control of Forest villages, 1969; the Nagaland Rules for Protection of Forest from Fire, 1969; the Nagaland village and Area Council Act, 1970; the Village Development Rules, 1980; the Nagaland *Jhumland* Act, 1970, The Nagaland Land (Requisition & Acquisition) Act, 1965 and the Nagaland Tree Felling Regulations, 2002. The reserved forest, protected forests, wildlife sanctuaries and National parks are under the control and management of the Forest Department. The village forest and land are under the control and management of the land owners as according to the provision to 371A of the constitution, which granted a special status to the state of Nagaland enabling the people to protect and governed by Naga customary law and procedure, in matters relating to social practices of the Nagas, administration of civil and criminal justice involving decisions according to Naga customary law and ownership and transfer of land and its resources. However, their applicability in the State of Nagaland is limited due to constitutional safeguard guaranteed under the Article 371A of the Constitution (see Ao*et al.* 2013).

The Government of India has enacted the Schedule Tribe and other Forest Dwellers (Recognition of Forest Rights) Act, 2006 in order to protect and safeguard the rights of the tribal communities over forest resources. However, even the said Act cannot be extended in the State of Nagaland without complying with the provision of Article 371A of the Constitution of India. Due to the specific land holding system in the State of Nagaland, land and its resources belongs to the village/community/clan and individual. The State Government own only 11.7% of the land that too acquired

from the land owners. As the Nagas are the owner and possessor of the land and its resources which includes the forest, the Naga people do not need the protection of right *vide* provisions of Schedule Tribe and other Forest Dwellers (Recognition of Forest Rights) Act, 2006.

Therefore, there is a need for a shift toward policy planning and decision-making based primarily on the precautionary principle particularly in the area of forest conservation and agricultural production and market. An important question can be raised as of whether increased regulation in terms of the imposition of laws is a sufficient condition for dealing with the environmental problems caused by deforestation or whether a change in the free market economic system is necessary. The power, money, and influence of the sectors that benefit from forest should not be underestimated. For instance, in attempts to control deforestation in Nagaland, the problem arising out of the new approach to sustainable forest management that involves implementing forest conservation laws and accommodating the socio-economic needs of people become obvious. The forest department establishes laws to conserve the forest. At the same time, policies to provide for the economic livelihood of farmers involve the introduction economic plants introduced and other cash crops for cultivation. The farmers are lured to cut down the natural forest and replace them with economic plants/cash crops such as rubber, orange, teak, lichee, etc. In all the schemes/projects money is involved and the farmers no doubt they are benefitting. The inevitable outcome is tension between the local communities and the government laws of forest conservation. And in the process, what appears to be for the benefit of the farmers usually is diverted into the hands of the policy makers as farmers are forced to pay some amount for access/ avail the schemes and for cash crop cultivation contracts and market facilitations to sell their produce.

The State forest area has degraded to 32.95%. However, the State of Nagaland contributes for 2.01% of the country's forest cover out of the geographical area of 16, 57, 583 hectares. The State Government controls approximately 1, 00, 823 hectares (11.7%) of the forest and 7, 62, 107 hectares (8.3%) are under the private ownership. The state also represent 2,431 species of plants and large number from the animal's kingdom with 42 species of fishes and 55 species of birds of which some are endemic to Nagaland. A survey of amphibians conducted in the state from 1998 to 2002 shows 19 species as new record for the state and 5 species- *Megophrys wuliangshanensis, M.*

glandulosa, Amolops viridimaculatus, Rana humeralis and Rhacophorus gongshanensis as new records for the country (Ao *et al.* 2013:18). Nagaland is considered to be a biodiversity "hotspot" of high species richness and endemism. Assam Tribune, Nov 26, 2013, quoted Nagaland as the 'Falcon Capital of the World'. From the perspective of conservation biology, Nagaland, because of its status as a hotspot of biodiversity and endemism, can become a major contributor to the currently unfolding global mass extinction event. It is reasonable to expect the extinction of many forest species within the next decade if the current rate of habitat loss through deforestation. Deforestation and conversion of land for agriculture has caused habitat loss leading to threat to Blyth's tragopan, an endangered bird of the state. The Blyth's tragopan is listed in Schedule-I of wildlife (Protection) Act and classified as vulnerable on International Union of Conservation of Nature. Specifically, with regard to the question of deforestation and the protection of the biodiversity in the state, there will be a need for increased surveillance satellite imagery as this will provide complementary information about land use and forest fragmentation. Forests are a valid question; monitoring of activity in the region via satellite imagery thus becomes even more important.

The emergence of environmental issues at the top of the global agenda in the context of climate change concerns underline the need for collective endeavor for protection of environment. This warrants informed and voluntary participation of all sections of the people in the movement for conservation and participation of environment. Awareness of people about emerging environmental issues and the interconnections between the life styles and environment is an essential prerequisite for such participation. Population increase, rapid urbanization and industrialization, increasing needs of energy etc., have impacted the availability of natural resources besides denting the quality of environment. The environmental damage already inflicted cannot be reversed unless there is collective thinking, will and effort. These call for public awareness and participation for bringing about an attitudinal change and finally restricting further damage to the environment. Effective implementation of environmental management and conservation programmes depends on education, awareness raising and training in the relevant areas. Without an adequate awareness of the impending challenges and their implications, few people would be motivated to participate actively in programmes on environmental conservation. Environment

education and awareness thus assumes critical importance. (Annual Report 2011-12 Ministry of Environment & Forests Government of India; 2012). There must to be a need for a shift toward policy planning and decision- making based primarily on the precautionary principle. An important question can be raised as of whether increased regulation is a sufficient condition for dealing with the environmental problems caused by deforestation or whether a change in the economic system is necessary. The power, money, and influence of the sectors that benefit from forest economic system should not be underestimated.

This study is a historical perspective on deforestation in the north eastern state of Nagaland, India. It is from recent climatic research that deforestation has been one of the serious threats to global climate change which has only recently awakened global awareness. This problem is being looked at mainly in its contemporary context and the modern factors which seem to generate the cause of the problem. But the menace of deforestation has an important history at its global, regional, and local levels. There are historians, such as British historian, Clive Ponting, who points out that the problem of deforestation has a history which is actually thousands of years old and which already should have taught us important lessons if considered in the light of how many previous civilizations have collapsed as a result of abusing their natural resources. Describing in his book, *A Green History of the World* (2007), Ponting claims that the expansion of populations and settlements result in more and more trees being cut down to clear land for agriculture, provide fire for heating and cooking, and supply construction materials for homes and household goods. In the process, a series of ecological breakdowns occur as animals overgraze, topsoil erodes, and flooding becomes common. This process takes place in a cyclical pattern that has affected even the most formidable civilizations.

And so the study of the history of deforestation brings to the front the critical significance and urgency to address the problem of deforestation. Moreover, by considering closely what have happened in the past to precipitate the critical threat to society posed by deforestation, a historical perspective of deforestation in any locality contributes immensely to the identification of the underlying socio-economic, political, and cultural processes and factors which need to be factored into any plan to manage the problem of deforestation.

Thus, this study from its standpoint of a historical perspective of deforestation in the State of Nagaland in North-Eastern India is a classical case of how the examination of the problem of deforestation from the viewpoint of history can illuminate the identification and understanding of the socio-economic, cultural, and political factors that are interlocked with practices which have given rise to the problem of deforestation. A major threat to forests of India is in its northeastern states, principally linked to the slash-and-burn shifting cultivation method. From a historical perspective, the present study was able to trace the practice of *jhum* in Nagaland back into its ancient tradition and shed light into the socio-economic and cultural institutional processes which have made the practice of *jhum* a persistent factor in the problem of deforestation in Nagaland.

In many studies of forest degradation and deforestation in India, the history of the forest and the people who interact with the forest is not adequately taken into consideration. Due to this limitation, the study on Nagaland has examined the historical dimensions of forest-cover changes and the interrelation between these changes - the past and modern perceptions towards forest and changing behavioral patterns of the people. The study too provides insightful information for highlighting and addressing through relevant strategies the underlying causes of deforestation in the region for environmental policy makers, development planners, law makers, government officials, and other stakeholders and interest groups at all levels in the state of Nagaland, as well as in the entire northeastern region of India. It also contributes to a deeper comprehension of the historical, cultural, and socio-economic factors which underlie behavior in various societies of the world. Forest is a great wealth of the State; the following suggestions can be checked to help save deforestation and resources:

- Steps should be taken for giving strict punishment to those involved in illegal cutting of trees. It should be strictly seen that no one can escape from the hands of law when they are involved in illegal cutting of trees.
- Technocrats of all relevant disciplines should become involved in the management of forest.

-Research, development, and use of new high quality or improved forest seed and planting materials should receive maximum attention to increase forest resource productivity and as a result narrow the gap between demand and supply at the shortest possible time.

- Agro forestry should be practiced as a sustainable land use system for increasing productivity per unit area to reduce pressure on natural forest and also to conserve the environment
- Biological diversity must be treated more seriously. Biodiversity programmes should not only create awareness but to get everyone involved in biodiversity conservation.
- Local Communities must also be included in policy making so as to formulate the gap between law and practice.
- The literacy programme in these areas should be enhanced to promote environmental awareness and to conserve the forest areas for sustainable development of forest resources.
- Environmental education should be made compulsory from the elementary level.
- Sustainable development is possible without a corresponding degradation of the environment. Through programmes of sustainable consumption of trees and energy resources people can to develop as well as allow the environment to develop also. If this feat could be accomplished trees would be saved every year, pollution would be massively cut down, and humans would lead a more meaningful life.

History has important lessons to help us avoid the errors of the past. George Santayana (1980) in cautioning about failing to learn the lessons of history wrote in the beginning of the 20th century: “Those who cannot remember the past are condemned to repeat it.” The historical perspective of deforestation in Nagaland was very helpful in understanding the social values and relationships which have shaped the present processes of deforestation in Nagaland.

An important factor which has stood out in the unravelling of the deforestation problem in the history of Nagaland is the gradual ineffectiveness of traditional socio-cultural institutions in managing the forest resources. The two main causes for the weakening of traditional forest management institutions are the introduction at the State level of modern institutions for the management and control of forest resources and the shift from a traditional farming economy to a market oriented economy. The research could have been enhanced by the introduction of data analysis to show the relation between these variables- State level forest management shift from traditional

farming economy to the growth of market economy, and deforestation levels. But obtaining such data was not possible within the constraints of the resources available for the research.

One possible future extension of the work is to further research and explore the problematic issue of forest management in relation to sustaining forest resources and the livelihood of rural communities in the face of rapid socio-economic changes and expansion of the market economy in Nagaland. This includes an exploration of the relevance and possible effectiveness of traditional village or community institutions in order re-enforcement on the value of forest in the village and state control institutions with regard to forest management; the implications of present forest management approach, both traditional and modern methods, for the sustainable livelihood of the rural communities; and the sustainability of forest resources within an expanding market economy.

END NOTE

1. *Alnus nepalensis* is a pioneer species of degraded lands. It grows well in full light and is moderately shade-tolerant. It does not require fertile soil. It prefers permeable soils and thrives on land with a high water table but not completely waterlogged. It is a rapid colonizer of gravelly lands and old cultivated lands which are frequently unstable.

2. Jay Anand. Emerging institutional perspectives: A case study on managing bamboo resources for charcoal production in Nagaland, India inClimate Change: Adaptation, Resilience and Energy Security. p. 12

3. Anup Das, P.K. Ghosh, B.U. Choudhury, D.P. Patel, G.C. Munda, S.V. Ngachan and Pulakabha Chowdhury. ISPRS Archives XXXVIII-8/W3 Workshop Proceedings: Impact of Climate Change on Agriculture: Climate Change in Northeast India: Recent Facts and Events –Worry for Agricultural Management.

4. Anubhav, Kundan Singh, Akanksha Rastogi and Vir Singh. Sacred Groves in India: Celebrating Sanctity of Life through Biodiversity Conservation. Department of Environmental Science, College of Basic Sciences and Humanities, GB Pant University of Agriculture & Technology, Pantnagar. p. 1

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Appendix-1: List of plants

Scientific Name	Common Name
Michelia champaca	Titasopa
Morus lavaegata	Bhola
Gmelina arborea	Gamari
Phoebe goalparensis	Bonsum
Mansonia dipkae	Badam
Dalbergia sissoo	Sissoo
Shorea robusta	Sal
Terminalia myriocarpa	Hollock
Alianthus grandis	Borpat
Bombax malabaricum	Simul
Mangifera indica	Aam
Tetramelus nudiflora	Bhelu
Albizzia lebbec	Kala siris
Albizzia procera	Koroi
Amoora wallichi	Amari
Artocarpus chaplasha	Sam
Altingia excels	Jutuli
Betula alnoides	Betula
Chilrassia tabularis	Bogipoma
Cedrella toona	Jatipoma
Cinnamum cecicodaphne	Gonsoroi
Canarium resiniforum	Dhuna
Endospermum chinesis	Phulgamari
Eugenia jambolana	Jamun
Pinus khasiya	Pine
Magnolia rubra	Sopa

Mesua ferrea	Nahor
Schima wallichi	Gogra
Terminalia chebula	Helika
Taluma phelocarpa	Gahorisopa
Acrocarpus fraxinifolius	Mandhani
Artocarpus integrifolia	Kothal Sam
Adina cordifolia	Haldu
Alnus nepalensis	Alder
Bischofia javanica	Urium
Dellinea indica	Outenga
Duabanga sonneroitoides	Khokon
Cassia fistula	Sonari
Garuga pinnata	Thutmala
Lagerstroemia flosregina	Ajhar
Lagerstroemia parviflora	Sida
Lannea grandis	Jiapoma
Sterospermum chelenoides	Paroli
Terminalia belerica	Behera
Anthocephalus kadamba	Kodam
Alstonia scholaris	Satiana
Ficus spp	Hatipoila
Pterospermum lancifolium	Bonboguri
Podacarpus nerifolia	Jinari
Phoche cooperiana	Mekai
Spondias mangifera	Amra

(Source: Annual Administrative Report 2012-2013)

Appendix-2: List of birds collected by Godwin Austen in 1870 -73

Limnaetus Kienierii
Glaudicium *brodlaei*
Hirundu *gutturelis*
Nyctirouis *Athertoii*
Eurystomus *Orientalis*
Homrains *bircornis*
Picus *cathpharius*
Hypopicus Hyper – *Ythrus*
Vanilla *Pyrrhotis*
Aethopyga *Ignicauda*
Dicaeum *Charysorhoeum*
Pachyglossa *malanoxamtha*
Certhia *Nepalensis*
Sitta *Nagaenis*
Tehitrea *Affinis*
Muscicapula *Supercillaris*
Erythrosterna *Sordida*
Siphia *Erythraca*
Erythrosterna *Maculata*
Planesticusy *Fuscatus*
Paradoxornis *Austeni*
Pomatorhinus *Ruficollis*
Gurralax *cerulatus*
Trochalopterum *Cineraceum*
Actinodura *Waldeni*
Ructicilla *Aurore*
Cegithalicus *Erythrocephalus*
Parus *Monticolus*
Corvus *Culminatus*
Urocissa *Magnirostris*
Passer *Cinnamomeus*
Emberiza *Fucata*
Alsocomus *Punieeus*
Ceriornis *Blythii*
Turnix *Dissumirri*
Casarca *Leucoptera*
Ephiates
Micropternus *Phaioceps*
Cyanops *Asiatica*
Tardullus *Pallens*
Phyllornis Cochin *Chinensis*
Oothotomus *Favovirids*
Neornis *Assimilis*
Refuloides *Chaloronotus*
Abrornis *casdtancoceps*
Minla *Ignotineta*
Proparus *Vinipectus*
Ixulus *Castanicepa*
Ynhima *Nicrimentum*
Sylviparus *Modestus*
Sibia Pulchella

Appendix-3

File No. Record /stg/NL/49/71

Sub: Naga Hills Jhum Land Regulation, 1946.

Extract from the Assam Gazette dated 23rd October, 1946. No. 43 of 1946. (Part ii O. P.1693-1693.

The 16th October 1946.

No.Ex./N/57/46/26-G.S-(the following Regulation made by his Excellency the Governor of Assam under – Section (2) of Section 92 of Government of India Act 1935, and assented to by his Excellency the Governor-General is republished for General information:-

REGULATION-III OF 1946. (The Naga Hills Jhum Land Regulation, 1946)

where as it is expedient to frame a Regulation in Preamble. Order to safeguard and regulate the rights of Nagas to *jhum* Lands in the Naga Hills district.

Now, therefore, the Governor of Assam, in exercise of the lowers conferred by Subsection (2) of Section 92, of the Government of India Act, 1935, is pleased to make the following Regulation-

Title and Application

1. (1) This regulation shall be called the Naga Hills *Jhum* Land Regulation, 1946

(2) It extends to the whole of the Naga Hills District.

(3)It shall come into force at once.

(4)Its provisions shall apply in super session of all existing enactments and rules so far as the latte are inconsistent with, contrary to or repugnant to the provisions of this regulation.

Definition

2. In this regulation:

(a) "Land conservator" means and includes the Deputy Commissioner of the Naga Hills, any officer exercising the powers of a District Magistrate

within the Naga Hills, any Sub-Divisional Officer within the limits of subdivision and any officer especially invested by the Governor of Assam with the powers of a Land conservator under this regulation,

(b) " *Jhum* Land" means and includes all land which any member or member of a village or a community have a customary right to cultivate by means of shifting cultivation or to utilize by clearing jungle or gazing livestock, provided that such village or community is in a permanent location: but does not include, (1) Any land which has been or may be terraced for the purpose of permanent or super anent cultivation whether by means irrigation or not, or (ii) any land attached or appurtenant to a dwelling- house and for the purpose of permanent cultivation, or (iii) any land which in the opinion of the Deputy Commissioner is subject to permanent cultivation.

Explanation

1. Any land which is otherwise *Jhum* land according to the about definition shall be deemed to be so notwithstanding the fact that part or whole thereof may have been planted with fruit trees, bamboos or Tung or reserved for growing firewood, (2) A village or community shall be held to be in a permanent location if it always remains within a specific area, although part or the whole of such village or community may migrated from time to time to different localities within that area, (c) community includes the residents of village as a whole, the clan, sub-clan, phratry or kindred.

Distribution

3. Where more than one Land of work among Land conservators exertion may, subject to any orders issued by the governor of Assam, make such arrangement as he thinks fit for the distribution of work among such land conservators.

4. (1) A customary right to *Jhum* land shall be deemed to be established in favour to a village, or a community when such a village or community has enjoyed the right to cultivate or utilize such Jhum land for not less than 30

years, (2) A customary right to *Jhum* land shall be deemed to be established in favour of an individual's cultivator:-(a) if he has inherited the land in accordance with a local custom: or (b) if he has purchased the land prior to the making of this Regulation and such purchase was not contrary to local custom, or (c) if he has purchased the land at any date subsequent to the making of this Regulation, provided such purchase was not contrary to any local custom or any of the provisions of this Regulation. (d) if, being a resident of a permanent village, he has brought the land under cultivation, and the land has not been cultivated at any time within 30 years preceding his bringing the same into cultivation. Provided that such land is within cultivable reach of his own village.

Transfers

5. (1) Jhum land to which a community has a customary right may not be transferred to another community or to any individual except with the permission of land conservator, (2) Jhum land to which an individual belonging to a village or community has a customary right may be transferred to another member of the same village or community or to that village or community as a whole. It shall not be transferred to another village or community or to a member of another village or community except with the previous permission of the land conservator, (3) Nothing in this section shall affect a transfer which is valid under any provision of this Regulation.

Leases

6. (1) No *Jhum* land shall be leased by anyone having a customary right there to unless, (a) the land conservator has approved of such lease on the ground that such lease benefits the village or the community, or (b) the lessor is, by reason of age or other infirmity, unable to cultivate or utilize it, and the lessee is a member of the same village or community as the lessor, (2) A lease under clause (b) about shall be determined on the death of the lessor, (b) or on the termination of his infirmity, provided that the lessee shall be entitled to tend and reap any crop standing on the leased land on the date of the determination of the lease.

Improper Transfer and Leases

7. *Jhum* land which is transferred or leased otherwise than in accordance with the provision of this Regulation shall be deemed to have been forfeited and subject to any customary right of inheritance, may be transferred by the land conservator to any member or members of the village or community to which the transfer or less or belongs or belonged.

Terraced Cultivation

8. Any member of the village or community to which the person or persons having a customary right to any *Jhum* land belong may establish terraced cultivation within such Jhum land with the permission of such persons or which the permission of the land conservator who may in crating no such permission attach such conditions as he thinks fit.

Forest Produce

9. Subject to any orders that may be made under this Regulation, persons having customary rights to any *Jhum* land shall, be entitled to forest produce from such land for their own use or the use of members of their own village or community, but shall not without the permission of the land conservator, be entitled to sell or transfer otherwise such produce to any other person.

10. (1) All customary rights in *Jhum* land as are now in existence shall subsist subject to the provision of this Regulation and any other land or Regulation which may hereafter be enacted by competent authority, (2) Such rights shall also be subject to the payment by the person entitled thereto of such rents, taxes or any other dues as may he lawfully imposed from time to time by competent authority, (3) Where any such rents, taxes or other dues have not been paid by any person, the Deputy commissioner, Additional Deputy Commissioner or sub divisional officer may suspend the rights of that person to all *Jhum* land and, if the default has subsisted for more than a year, may declare such of that person to have been extinguished and may there upon make such arrangement for the transfer of the rights as he thinks fit.

Acquisition for Public Purpose

11. The Government may acquire any *jhum* land required for a public purpose. No formal acquisition proceedings shall be necessary but an opportunity shall be given to those having rights in the land to show ensue against such acquisitions and reasonable compensation shall be paid for all land acquired under this section. Land so acquired shall, if relinquished by the government at any time, be returned to the village community or individual from whom it was acquired on refund, if any, of such compensation to the Government as the latter may decide.

Ejectments

12. The land conservator may at any time summarily eject without notice any person who has squatted without authority on any *Jhum* land.

Prevention of Erosion

13. (1) The land conservator may at any time make such general or special order for the reforestation of *jhum* land as he thinks fit, as also for ensuring that trips of reasonable with within any *jhum* land may not be cultivated, (2) Where it appears that undue erosion or diminution of the supply of water required for irrigation is resulting or is likely to result from the excessive cutting of trees from any Jhum land, the land conservator may direct that a part or the whole of such Jhum land shall be a protected forest without the permission of the land conservator, (3) where it appears that undue erosion or diminution of the supply of water required or likely to be required for irrigation is resulting or is likely to result from the cultivation of any *Jhum* land, the land conservator may direct that the *Jhum* shall not be cultivated by any person for a period not exceeding ten years, (4) No order shall be made under sub-section (2) or sub-section (3) unless a reasonable opportunity has been given to those having customary rights to the land to prefer objections against such order and unless all objections so preferred have been considered and rejected as unreasonable or tenable, (5) For the purpose of protecting a road or bridle path, the land conservator may district that any land lying within 50 yards of the road or bridle path shall

not be cultivated and may further direct that trees upon such land shall not be felled or cut, (6) The land conservator may direct that for the purpose of preserving water supply, any particular area under jungle and previously in-*Jhumed* shall remain uncultivated provided that the existing rights of the community or the individual to collect forest produce shall not be interfered with.

Prevention of Fire

14. The land conservator may make such general or special orders as he thinks fit to prevent risk of damage by fire to *Jhum* land.

15. The land conservator may be order prohibit the establishment of any new residential houses on may *Jhum* land: provided that no order shall be made under this section which would prevent persons having customary rights to the land from securing reasonable adequate accommodation for themselves and their families.

16. Where a tribal council approved by the governor in this behalf has been setup in any area, any or all of the powers granted to the land conservator under the prevision of this Regulation may be vested at the discretion of the Governor in that Tribal council in respect of such area and the land conservator shall not exercise any powers so vested.

17. Any person who intentionally disobeys or violates any order or direction passed by competent authority under any of the provisions of this Regulation, shall face conviction for such offence, he punished with imprisonment of either description for o month, or with a fine not exceeding five hundred purpose, or with both.

18. (a) Any person conviction for any offence under the last produce ding section and sentenced to suffer any imprisonment or to pay a fine exceeding fifty Rupees may appeal to the governor whose decision shall be final, (b) The Governor may call for and examine the record of any proceeding or trial under the provisions of this Regulation and may set aside, modify or alter any order or sentence passed by any subordination authority.

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Oral Sources

Ntsomo Murry, 86 years, N. Longidang village, 26th June, 2013

Nyimtsemo Ezung, 83 years, N. Longidang village, 26th June 2013

Renphamo Tsanglo, 48 years, Sankitong village, 27th June 2013

Nchumbemo Tsanglo, 60 years, Sankitong village, 27th June 2013

Chubam, 78 years, Peren village, 30th July 2013

Heisuiding Irangbe, 80 years, Benru village, 31st July 2013

Ingimhangbe Thou, 86 years, Benru village, 31st July 2013

Hovishe Wotsa, 89 years, Mishelimi village, 12th Sept 2013

Khupu, 72 years, Mishelimi village, 12th Sept 2013

Tokiye, 54 years, Mishelimi village, 12th Sept 2013

Khulu, 56 years, Mishelimi village, 12th Sept 2013

Jshokhum, 72 years, Khutur village, 12th Feb 2014

Shochah, 60 years, Khutur village, 12th Feb 2014

Neoji, 61 years, Khutur village, 12th Feb 2014

Ritsong, 55 years, Khutur village, 12th Feb 2014

Throng Kiuba, 67 years, Chessor village, 13th Feb 2014

Nokrumba, 81 years, Chessor village, 13th Feb 2014

Lothrong, 87 years, Sotokor village, 13th Feb 2014

Dokiu, 46 years, Sotokor village, 13th Feb 2014

Shobhu, 88 years, Sotokor village, 13th Feb 2014

Kiremwati Aier, 87 years, Waromung village, 20th March 2014

Alemchiba, 85 years, Waromung village, 20th March 2014

Lame Jongvang, Chief Angh, 55 years. Sangnu village, 6th May 2014

Henpong, 45 years, Wakching village, 7th May 2014

C. Nyangpong, 62 years, Wakching Town, 7th May 2014

Nokao, 52 years, Zakho village, 8th May 2014

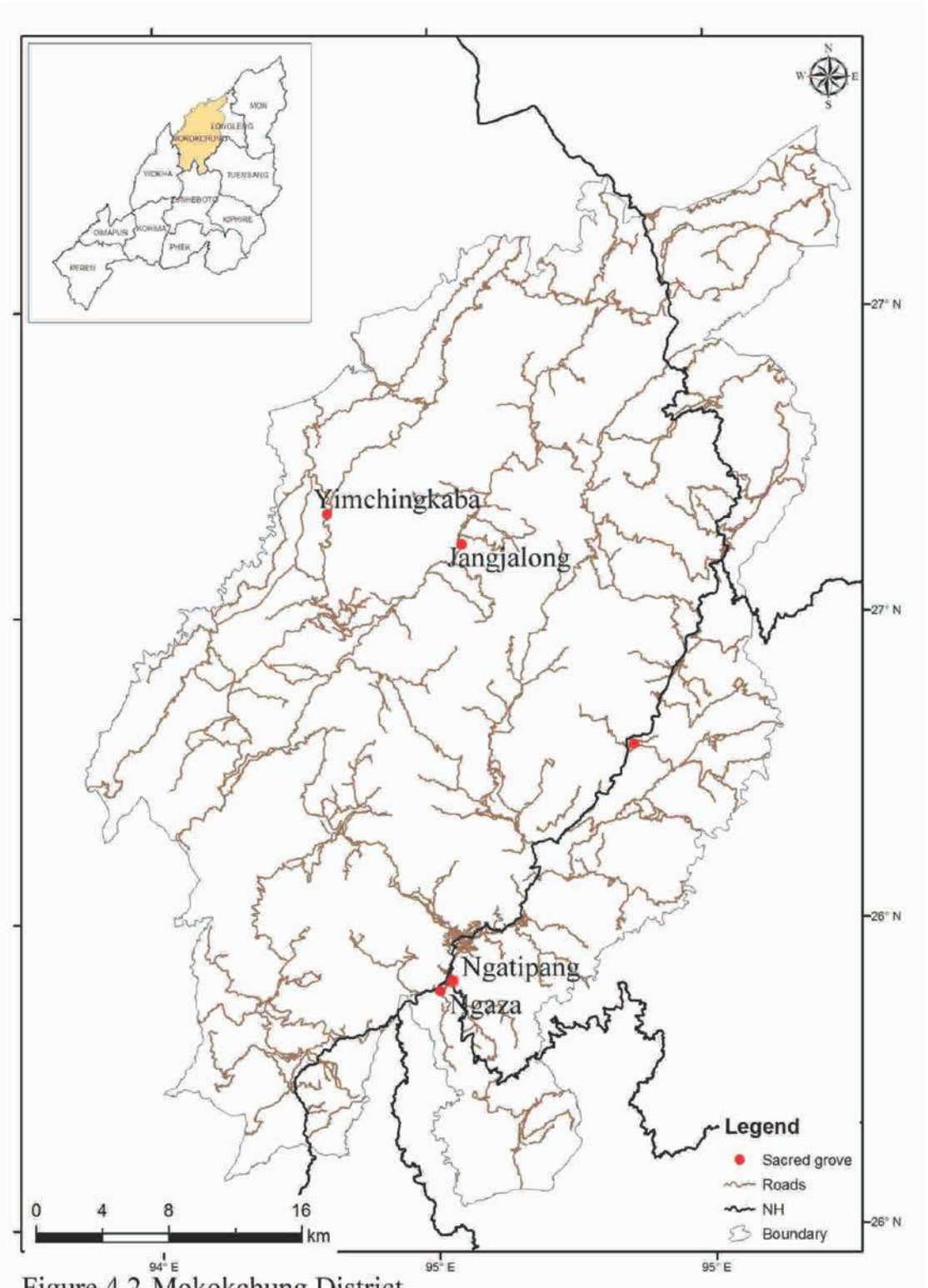

Figure 4.2-Mokokchung District

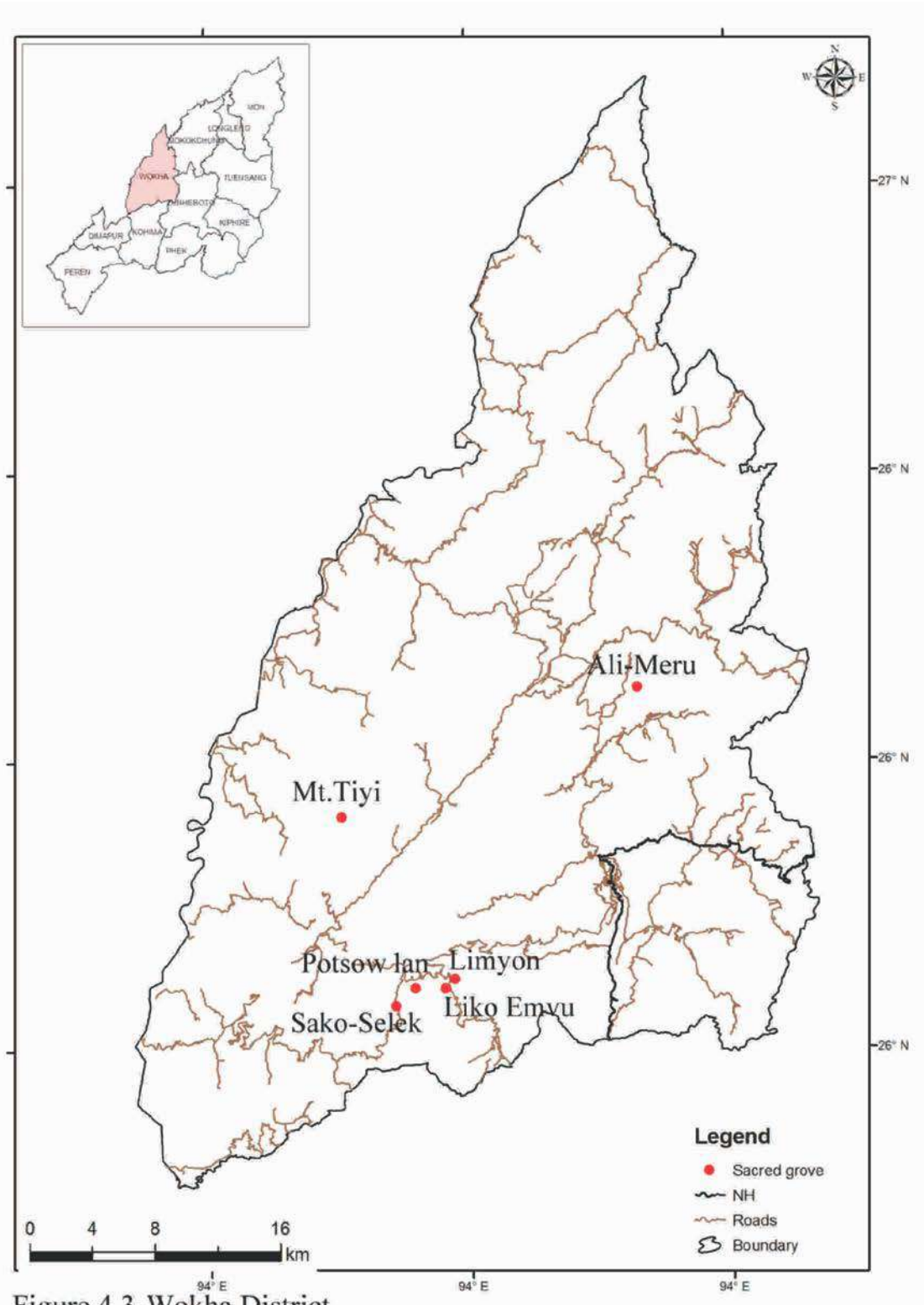

Figure 4.3-Wokha District

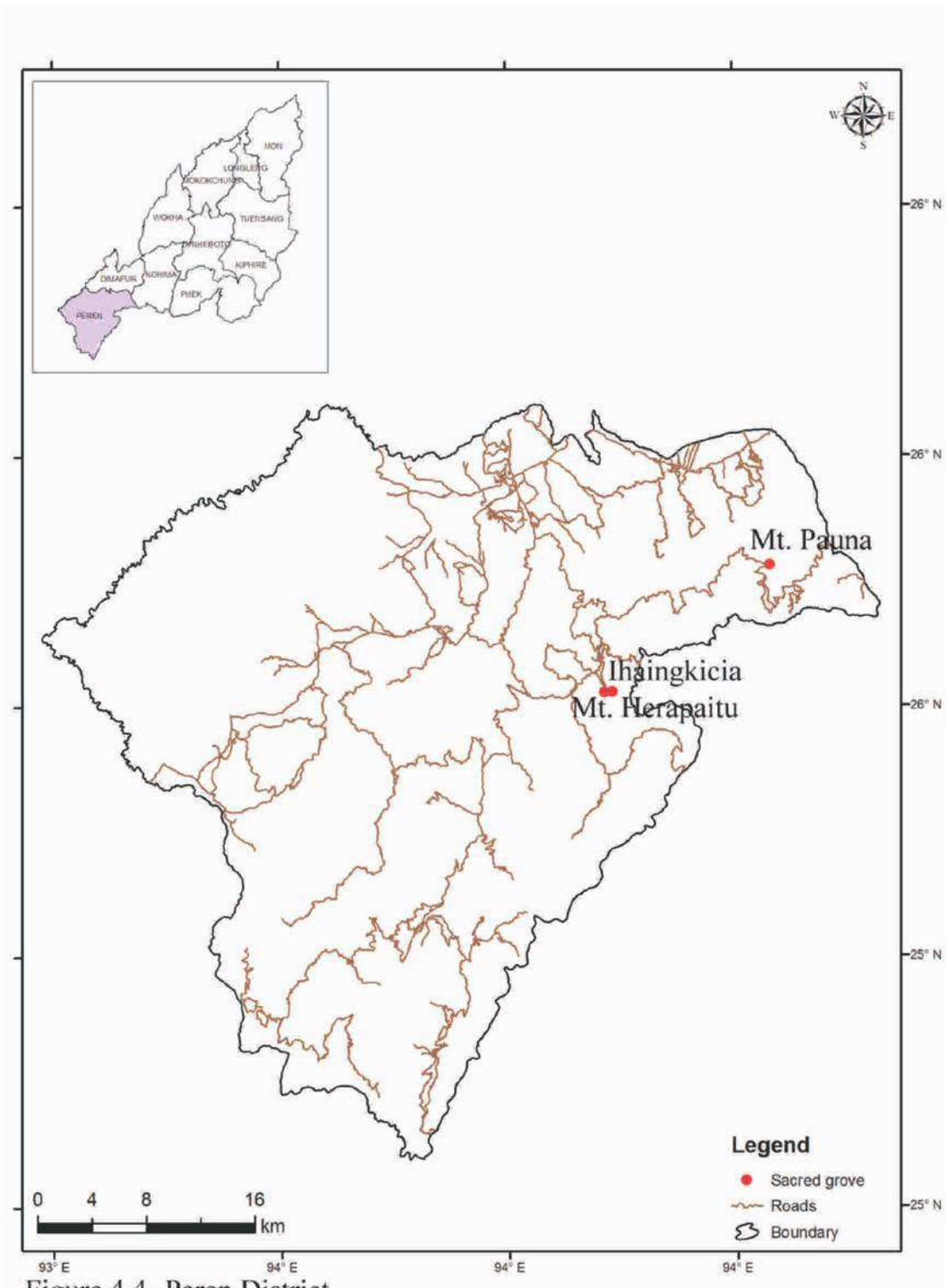

Figure 4.4- Peren District

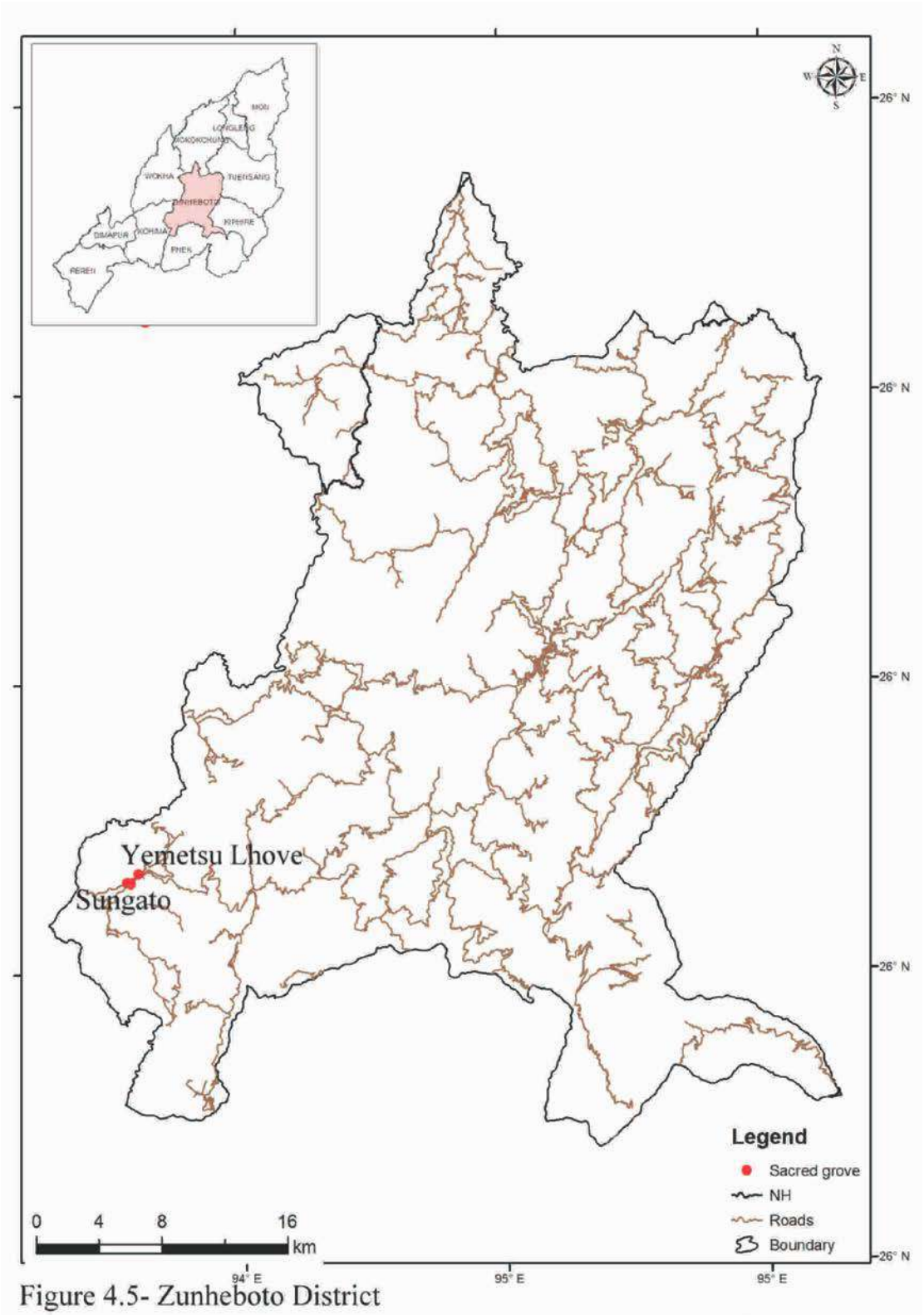

Figure 4.5- Zunheboto District

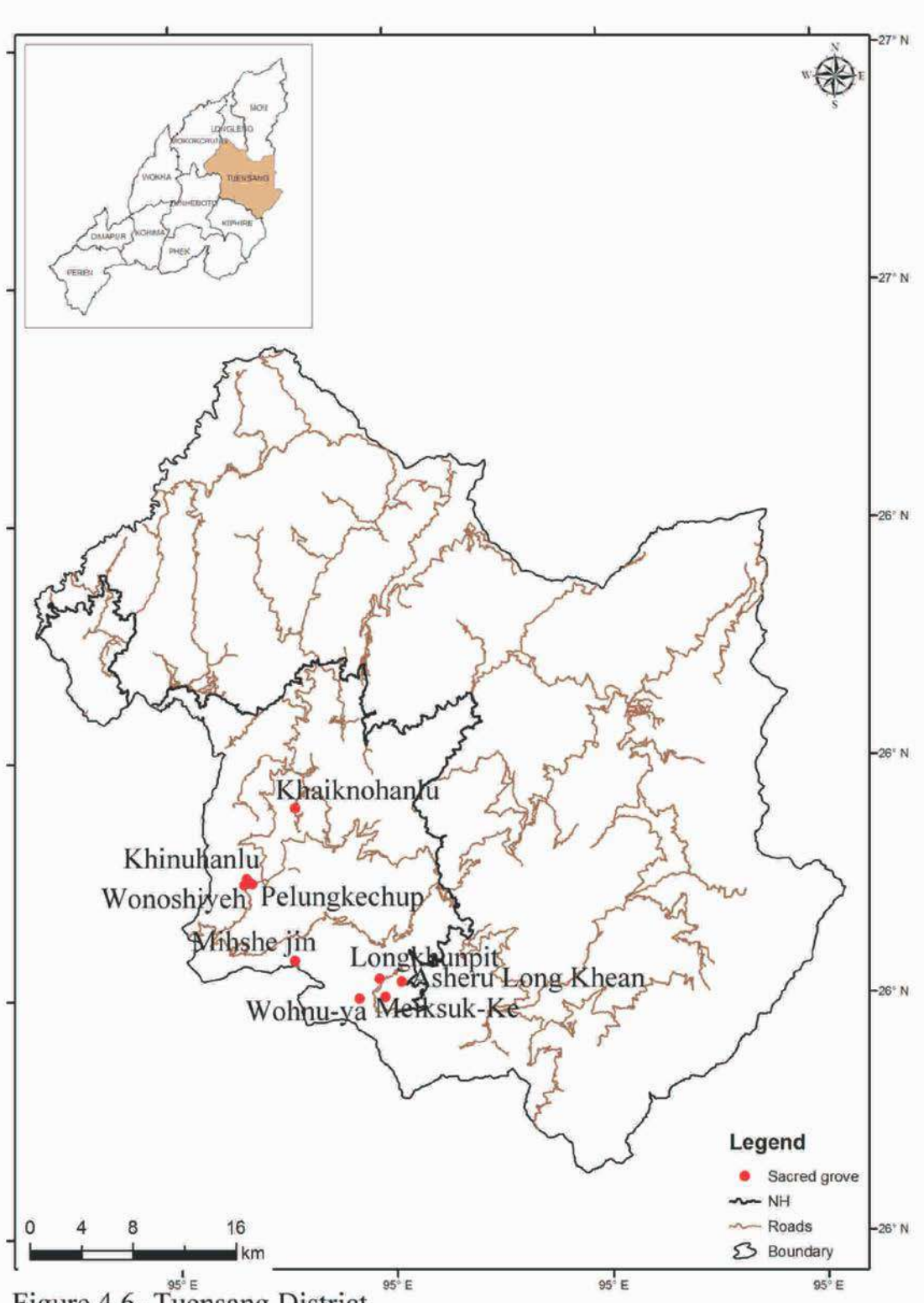

Figure 4.6- Tuensang District

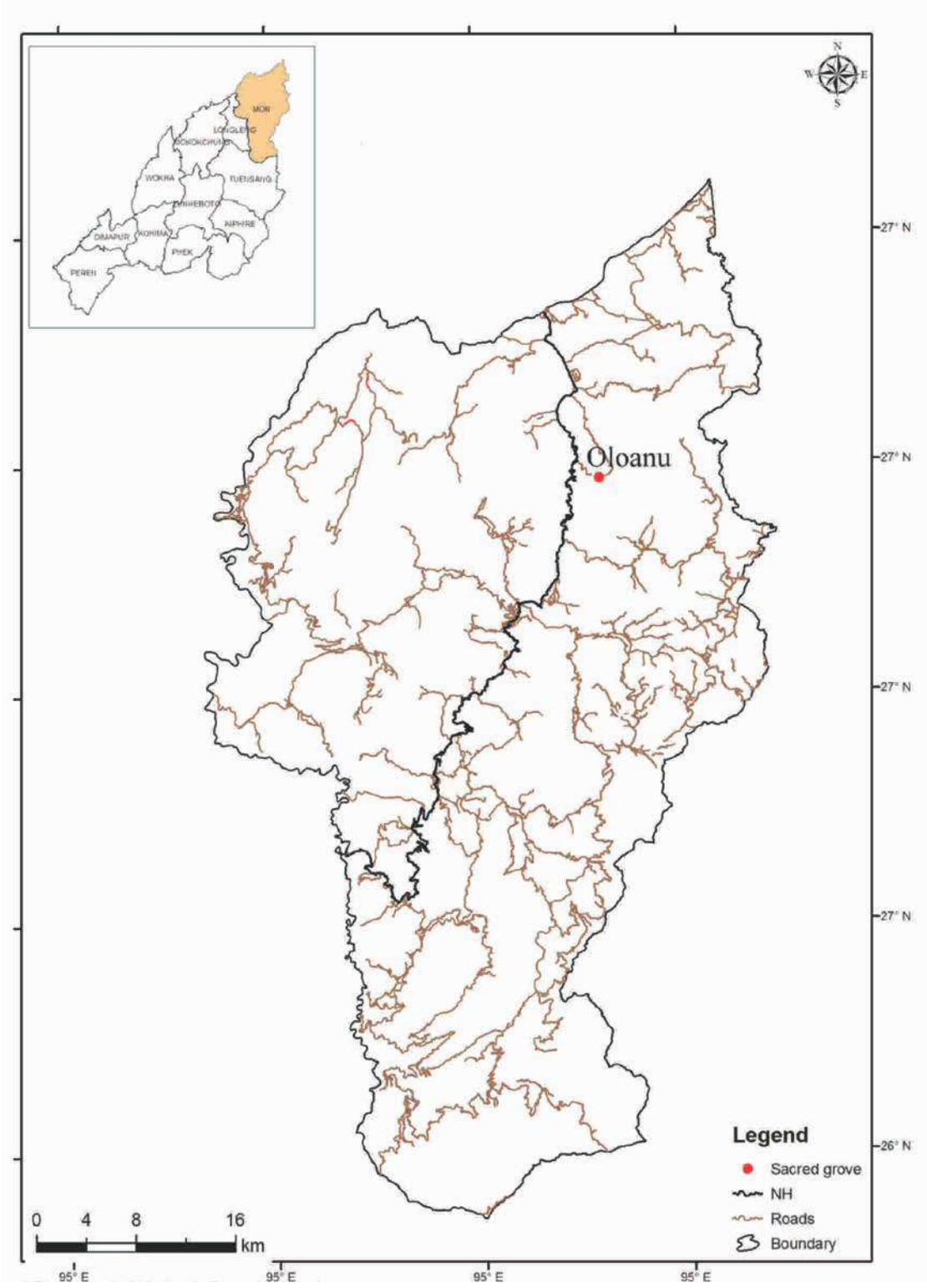

Figure 4.7- Mon District

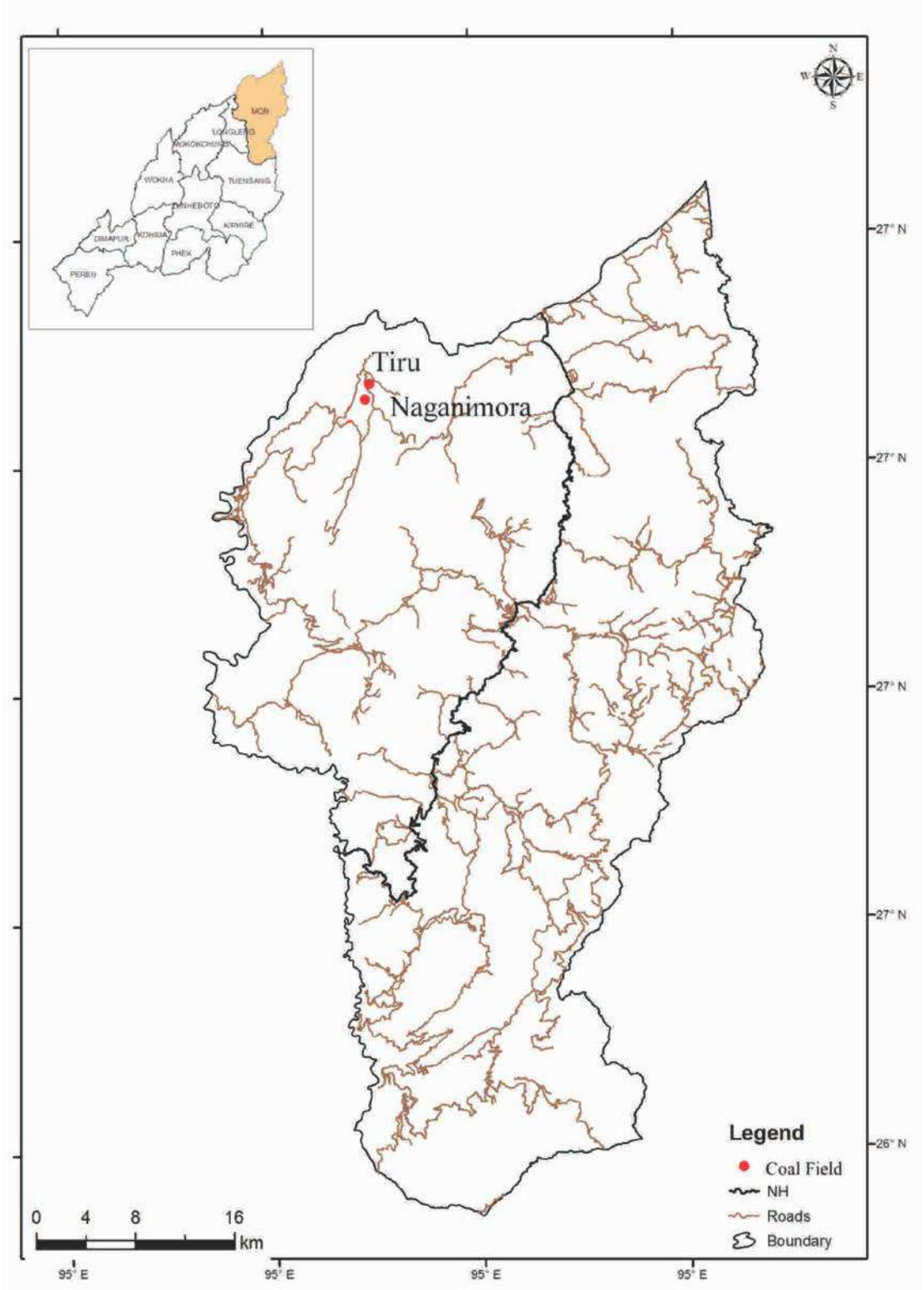

Figure 6.2- Coal field, Mon District

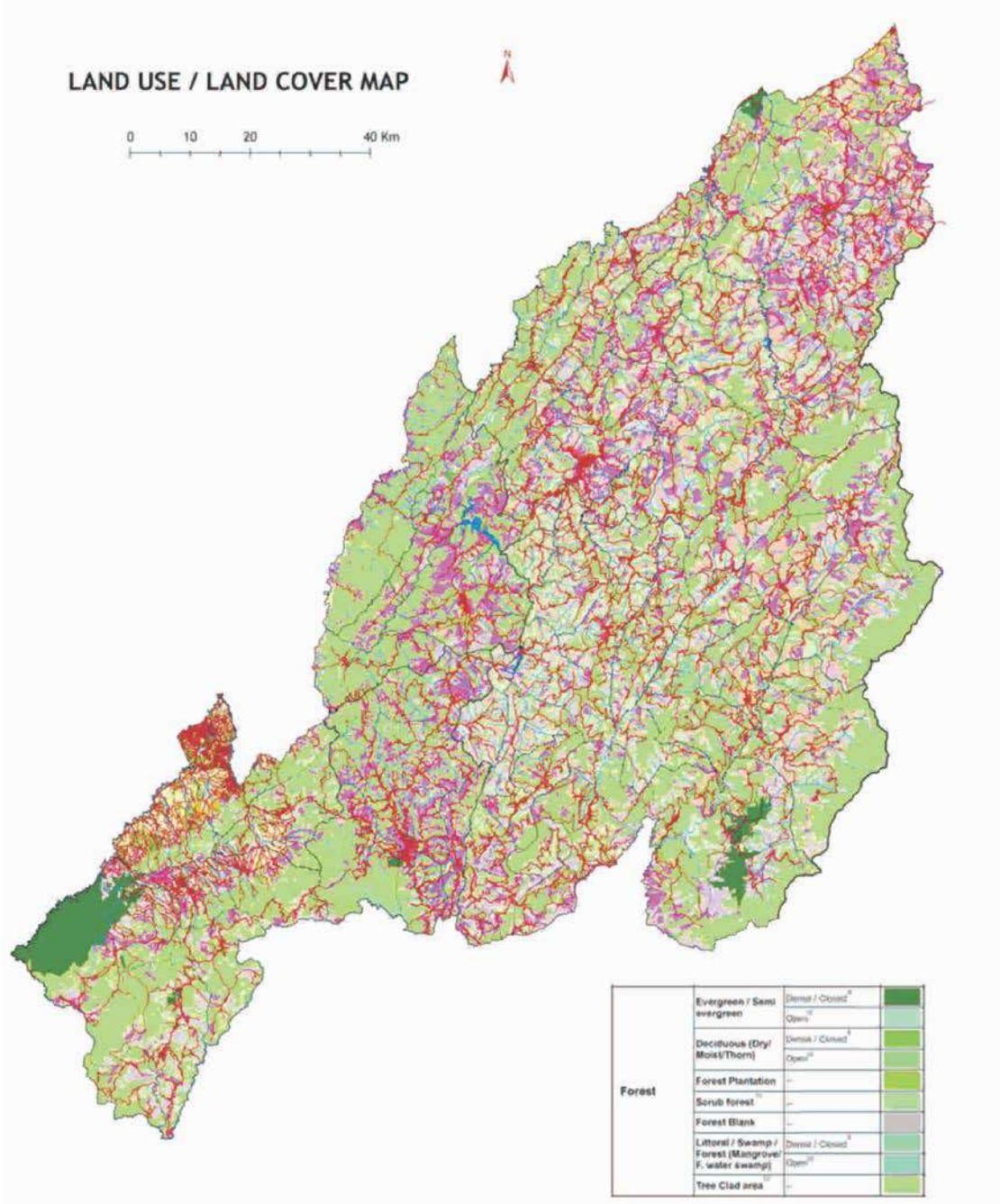

Figure 6.5-Land Use Land Cover 2011-2012
Source : Nagaland Science & Technology Council, Kohima

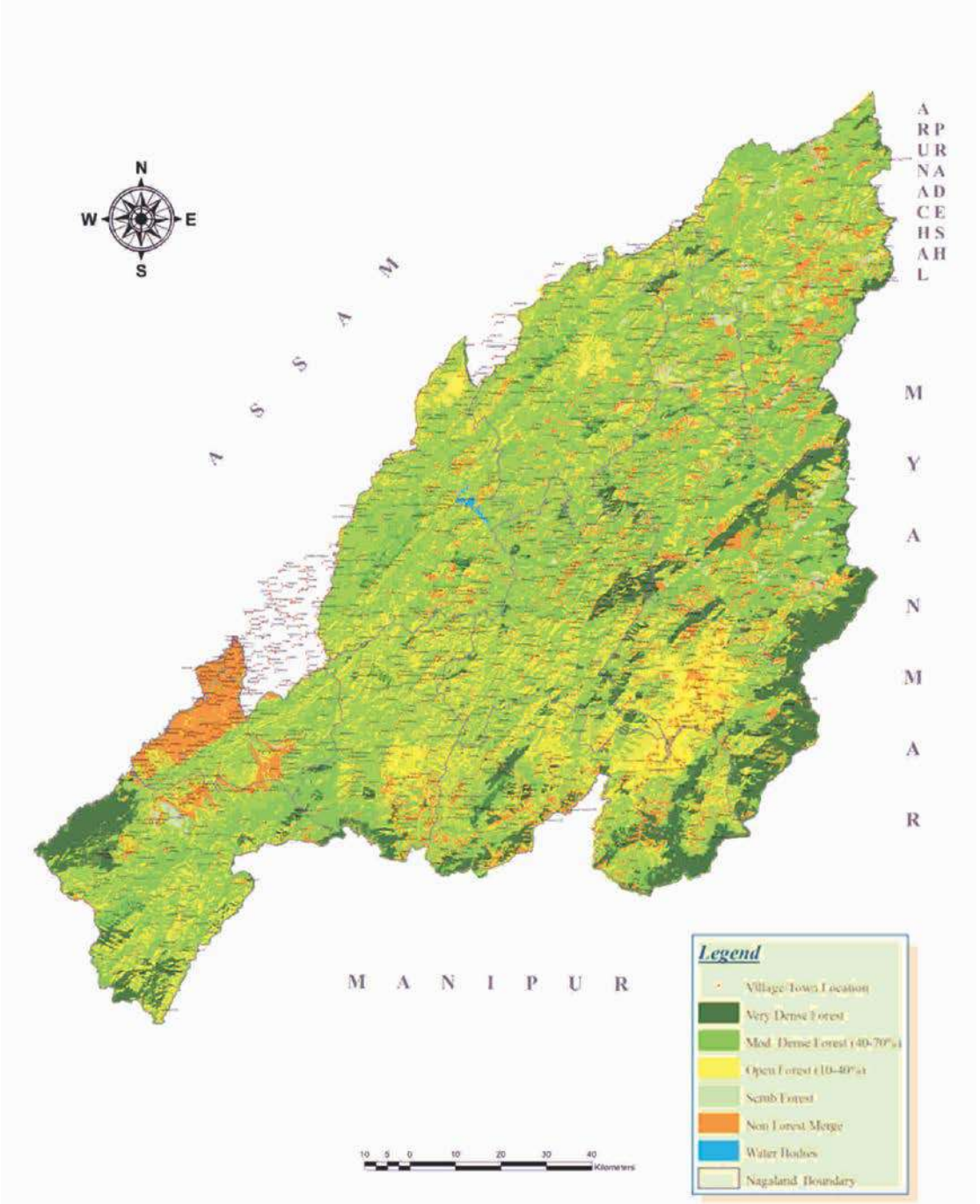

Figure 6.6- Forest cover of Nagaland
Source : GIS & RS, Deptt. of Planning & Co-ordination Kohima

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