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Forests Resources Degradation: A Case Study of Nagaland, North-East India.

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Abstract

Nagaland has 862930 ha of forest cover area. 88.3% of the forest is owned by the individual/private and only 11.7% is owned by government. The state is witnessing a rapid population growth in the last decade's as a result fresh forest areas were felled and cleared for agriculture, timber and firewood. Forest resources degradation is witnessed in both private and government forests. However, the rate of deforestation is alarmingly high in private forests due to logging, shifting cultivation/jhum and heavy consumption of firewood. The frequent forest fire is threat to forest resource. Some Naga tribes have the tradition of burning forest in dry season. The forest resource degradation can be attributed to Article 371(A) of the Indian Constitution which has empowered Nagas authority over the land and its resources. As such the state government has limited scope to strictly implement the Forest Act and Laws in the land. There is an urgent need to initiate grass root level awareness seminar and workshop to manage and mitigate the forest resource in the state.

Introduction

Forest has play a significant role and provides a wide choice for an independent spirited Naga to wonder in forests for fishing, hunting and gathering. Forests have been traditionally looked as a great source of economic by the Naga's as they greatly depend on forest for their livelihood. It has a profound influence on the structure and function of human habitat locally as well as globally and also the largest reservoir of flora and fauna. The world has about 3,870 million ha of forests (FAO, 2001). The state is witnessing rapid population growth in the last few decades as a result large tracts of forests were cut and cleared as demand surged for lumber, fuel, pasture and agriculture land. Population growth is one of the most important reasons for the present forest crisis. There is a definite inverse relationship between trends of forest areas and population at the global scale. It has been found beyond doubt that in countries with rapidly expanding population, the forest areas are rapidly contracting. Conversely, where the population is stagnating or growing very slowly, the forest land is stagnating or expanding slowly (Bebarta K.C, 2004). Hussain (1988) stated that the jhum cycle in some parts of Nagaland is as short as 5 to 6 years, which is not sufficient for the regeneration of forests. Deforestation has primary attributed to the process of conversion of forest land to other uses, mostly agricultural purpose. The leading causes of deforestation are the extension of subsistence farming (Africa) estate crops such as rubber and oil palm (Asia) and government backed conversion of forests to other land uses such as large scale ranching (Latin America) (FAO,1997). In 1980's logging in the state has become a big business. Companies from outside has setup sawmills in many part of the state to explore natural resources. No other method of forest exploitation has been as destructive as logging because in some part of Nagaland most of the centuries old tree was felled systematically. It may not be an exaggeration to say that this type of logging has destroyed nearly all the virgin forest of Nagaland within a short span of time (Souza D. A 2001). Consumption of firewood has increased both in rural and urban because of the population growth. Fuel wood now accounts for more than half of the annual world harvest of wood, and it is being cut more rapidly than it can grow back in many developing countries. Today more than half of those depending on fuel wood are facing current or potential shortage (Marsh M.W and Jr J.G 2005).

Shifting cultivation has been identified as one of the principal causes of deforestation in most of tropical regions of the globe, accounting for 70, 50 and 35 percent respectively in Africa, Asia and tropical America. About 500 million people and 240 million hectares of closed forests are involved in shifting cultivation, which is increasing at an average rate of 1.25 per cent. More than 5 million hectares of new forest fallow are created annually (Lanly, 1985). There is considerable loss of forest resources, soil, flora and fauna due to frequent burning and cutting of jungles. The forests burning phenomenon is responsible for killing of fauna, wildlife, forest species of plant and animal kingdom (Singh.M.K and Ahmed .P, 2006). In fact, the state is dealing with the problem of forest burning. Wild fires or burning of forests usually takes place during the burning of jhum fields. Though using of fire is an integral part of land management in both forestry and agriculture it has a wide ranging negative environmental impact. Some forests are ecologically adapted to fire. There is ample evidence that large proportions of wildfires that occurs each year are caused by human intervention (Bebarta K.C. 2004). India is one such developing country where forest degradation has taken place on account of unsustainable fuel wood consumption for house hold energy significantly contributes to pressures on forests. Consumption of wood (Timber and fuel wood) in India is considerably (4 to 5 times) higher than what can sustainably be removed from forests. In 1990, the estimated excess (Mostly unrecorded) removed of fuel wood from forests was about 250 million cubic meters. This figure has increased to 310 million by 2000 (FSI, 1999). FAO, (1997) stated that high population densities have led to wide spread forest degradation from fuel wood and fodder harvesting, cattle grazing, land invasion and shifting cultivation, and timber harvesting for local construction.

Materials and methods

The methods employed in this study include both secondary and primary data. The secondary data is drawn from the published sources, Government records, statistical handbooks, census reports, journal, newspapers, Gazetteers etc. The primary data is collected from Face to face interview and Focus Group Discussion with the villages and timber businessmen and analyzing the growth rate of trees with the help of measuring tape.

Study area

Geographically, the state is roughly triangular in shape and is situated between 25°06'N and 27°04' latitude and 93°2' and 95°15' E longitude and covers an area of 16,579 Km^2. It is predominantly a hilly state with only 8% of its total land area under plain. The state has, borders with the states of Assam and Arunachal Pradesh on one side, Manipur on the other and also has a vast international border with Myanmar. The altitude of the state varies from 194 m in the plain to 3048 m in the high hills. The major tribes of Nagaland are Angami, Ao, Lotha, Sema, Rengma, Phom, Pochury, Chakhesang, Zeliang, Yimchunger, Khiamungan, Chang and Konyak. In addition, Kuki, Garo, Kachari and several other tribal groups also live in Nagaland.

Result and discussion

The state has been endowed with a wide variety of forest on account of its unique geographic location and wide range of physiographic terrain (Table 1). Out of the total geographical area of 16,57,583 hectares of the state, forest occupy an area of approximately 8,62,930 hectares. The state government own only 100823 hectares and the private and community own 762107 hectares of the forest area. Classification of forests is shown in Table 2.

The department of Forest, Ecology, Environment and Wildlife, has stated that the forest cover in the state has more or less remained the same over the past. However, it is observed that the status of forest in

Table 1: Forest types of Nagaland.

Sl.No	Types of Forests	Area
1	Northern Tropical Wet Evergreen Forest	Mondistrict (Namsa – Tizit area and Zankam area)
2	Northern tropical Semi-Evergreen forest	Foothills of Assam – Nagaland border (Mokokchung, Wokha and Kohima districts)
3	Northern Sub-tropical Broad Leaved Wet hill forest	Found in the hill areas below 1800m and 500m in the entire district.
4	Northern Sub-Tropical Pine forest	Found at the elevation of 1000m to 500m in part of Phek and Teunsang districts.
5	Northern Montane Wet – Temperature forest	Saramati and Dzukou area
6	Alpine forest	Found at high altitudes ridges of Saramati range

Source: Deptt. of Forest, Ecology, Environment and Wildlife, Govt. of Nagaland. 2006-07

Table 2: The classification of forest area in Nagaland.

Sl.No	Legal status	Forest area (Hectares)	% of total forest area	% of total geographical
1	Reserved forest	8583	1.0	0.5177
2	Purchased forest	19162	2.2	1.1558
3	Protected forest	50756	5.9	3.0615
4	Wildlife sanctuary	22237	2.6	1.3413
Village forests				
i	Virgin forest	477827	55.4	28.8212
ii	Degraded forest	284280	32.9	17.1467
	Total	862845	100	52.0442
Ownership				
I	State government	100823	11.7	6.0
ii	Private/ Community	762107	88.3	46.0

Source : Deptt. Of Forest, Ecology, Environment and Wildlife, Govt. of Nagaland. 2006-07

Nagaland has degenerated into a situation in which in the absence of a working plan for the state, the consequence of forest loss will be unmanageable. The private and community forests vested with the villagers are being haphazardly, unscientifically exploited to meet the demand of the mills at the foot hills without taking into consideration the future supply. Despite of banned on felling of trees in Reserved Forest, Sanctuaries and Parks, there is still larger scale illegal exploitation and encroachment of forest land. Most of the forests baring the inaccessible areas are mostly deforested due to unplanned removals arising out of ignorance, arrogance and sheer greed.

The forest cover in the state, based on interpretation of satellite data of December 2006 – January 2007 is 13,464 sq km, which is 81,21% of the state's geographical area. In terms of forest canopy classes the state has 1,274 sq km Very Dense Forest, 4,897 sq km Moderately Dense Forests and 7293 open forest (Figure 1).

Forest cover in different canopy density classes and scrub along with the change compared to 2005 assessment are shown in table 3. The comparison of the forest covers (Satellite data of Dec 2006 – Jan 2007) shows a loss of 208 sq km of forest cover. The change matrix reveals that there has been a decrease of 6 sq km in the Very Dense Forest, 175 sq km in the Moderately Dense Forest and 20 sq km in Open Forest. According to Forest Survey of India (FSI), the main reason for the net decrease in forest cover was the shifting cultivation and bamboo flowering.

With rapid population growth in the state, the demand for food and firewood has increased both in rural and urban. Firewood

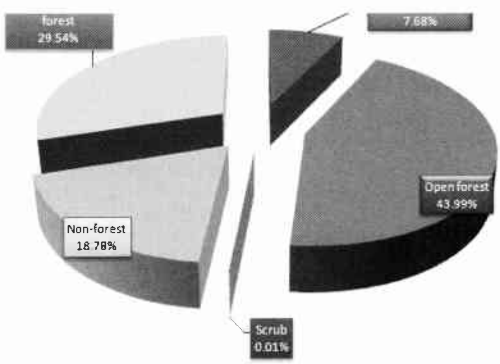
Table 3: Comparing assessment of 2005 and 2007 matrix change.

Sl.No	2005 (Data of Jan-Feb 2005)		2007 (data of Dec 2006 – Jan 2007)		Net change
1	VDF	1,280	VDF	1,274	-6
2	MDF	5,072	MDF	4,897	-175
3	OP	7,313	OP	7,293	-20
4	Scrub	9	Scrub	2	-7
5	NF	2,905	NF	3,113	+ 208

VDF = Very Dense Forest. MDF=Moderately Dense Forest. OP= Open Forest.
NF= Non Forest.

Source: India State of Forest 2009.

is the main of sources heating and cooking for nearly 82 per cent of rural population. In recent time the demand for firewood has increased in urban centre as the supply of Liquefied Petroleum Gas (LPG) is not sufficient for the growing urban population in the state. Approximately 20 to 30 quintals of firewood are consumed by a single household in urban areas and in rural areas approximately 70 to 100 quintals of firewood are consumed in a year. The quantity consumed widely varies from the size of households.



Source: India State of Forest Report 2009.
Figure 1: Forest Cover of Nagaland.

The construction of roads under various development schemes after the birth of state enabled the extraction of timber from hitherto unapproachable forest. The typical Moist Tropical Evergreen Rain forest of the Namsa- Tizit area of Mon district with its incomparable Dipterocarp and Makai trees, soaring hundreds of feet into the sky majestically with their compact crown creating a permanent twilight on the ground even in the hot tropical sunshine have vanished from mankind. The primeval virgin forests of Nagaland, Minkong (Mokokchung district), Helipong (Tuensang distirct), Mount Tiyi (Wokha district) Sastoi (Zunheboto district) and Zanidou (Phek district) are all in the process of vanishing. There are now only a few hundred square kilometers of primeval forests is left in Saramati and Japfu mountain range. These primeval forests are fast disappearing because of the heavy logging despite of banned by the Government.

The Forest Survey of India reported that shifting cultivation practices and bamboo flowering in the entire state are responsible for the decrease in the forest cover of the state. However, as per the observation done during field study between 2008 – 2010. It is important to know that shifting cultivation and bamboo flowering alone is not responsible for rapid forest degradation in the state. Random logging too is an additional factor. Although felling of trees for logging is banned by the Government, random logging business still continues in the state as Article 371(A) of the Indian Constitution empower Naga's authority over land and its resources. Forest degradation or decline is witnessed in both private forest as well as government forest. Nevertheless, the rate of deforestation is alarmingly high in private forest than the government protected forest. The study also observed that most of the log lying in sawmills are in the range of 50 cm to 90 cm girth. The harvestable age of the most economically valued trees are shown in table 4.

According to field observation, most of these trees take 25 to 30 years to reach the size of 50 cm to 150 cm in girths depending on the climate and soil condition of the area. It has been observed that, Alder (Alnus nepalensis) in 30 years grow up to 80 to 115 cm girths, Teak (Tectona grandis) in 30 years grow up to 50 to 100 cm girths, Gomari (Gmelina arborea) in 30 years grow up to 60 to 115 cm in girths, Pine (Pinus khasya) in 30 years grow up to 50 to 100 cm girths and Hollock (Terminalia myricarpa) in 30 years grow up to 50 to 120 cm in girths. From an interview with the timer businessman, it is found that Alder and Teak are mostly harvest at the age of 20 to 25 years, Gomari (Gmelina arborea) and Pine (Pinus khasya) are mostly harvest in 20 to 25 years and Hollock (Terminalia myricarpa) are mostly harvest in 20 to 25 years. However, it takes approximately 25 to 35 years to get valuable harvest (Table 4). Nevertheless, the harvesting periods depends from region to region. Deforestation and Afforestation are not in balance in many part of the state because it is observed that in many areas deforestation are not followed by afforestation. The once virgin forest today stand as open cover mainly because of lack of afforestation. The problems caused by encroachments of forest land for settlement or setting up farms are probably worse than those caused by clearing of forests for agriculture. This is perhaps the greatest single factor contributing to the depletion of forest in the state.

There is considerable loss of forest

Table 4: Minimum harvestable age of a selected tree species for saw logs.

Sl. No	Name of the tree	Harvestable age
1	Alder (Alnus nepalensis)	15 to 20 years
2	Teaks (Tectona grandis)	15 to 20 years
3	Gomari (Gmelina arborea)	20 to 25 years
4	Pine (Pinus khasya)	20 to 25 years
5	Hollock (Terminalia myricarpa)	10 to 15 years

Source: Field survey 2008 - 10.

resources, soil, flora and fauna due to frequent burning forests. The state is dealing with the problem of forest burning in a novel manner. The state Government is penalizing villagers for any forest burning incident even if they are not directly involved in setting the fires. The Government of Nagaland has banned jungle burning since 1996 but it wasn't adhered to. Following the government initiative, many tribal and village organization have banned forests burning. Some of the important villages are viz., Khonma and Mezoma villages of Angami tribes, Meluri and Lephori villages of Pochury tribes, Nathami and Sukhulu villages of Sema tribe, ungma and Sungratsu villages of Ao tribes, Ponching and Oragkong villages of Phom tribe, Tseminyu and Tesophenyu villages of Rengma tribes, etc. In areas where jhum or Slash and burn cultivation is practiced, precautionary fire fencing device are used so that the fire doesn't spread to the jungles. Despite of the measurement and banned by Government and village Councils, forest fire has destroyed some few thousand hectares of forests cover in 2009 alone. Notable forest fire incident in 2009 are namely, Akhuto area of Zunheboto district, Ungma and Khesa of Mokokchung district, Tseminyu area of Kohima district, Mezephema of Dimapur district, Mt, Tiyi of Wokha district, Longkhim area of Tuensang district etc. In 2010 about 15 sq Km of Dzukou valley was destroyed by forest fire. The field study observed that the forests fire that occurs each year in the state were caused by human intervention especially set by farmers while burning their jhum field, camper, hunters and in some cases it is burned intentionally by the villagers who has a tradition of burning forest.

Conclusion

Forest degradation has become a major issue in the state, as the forest resource belongs to people there is a random destruction of forest. The government protected forest is not free from the exploitation. Thought, shifting cultivation / jhum cultivation is considered to be non eco friendly by environmentalist it is the main stay of livelihood for the Nagas. Every year fresh forest cover is brought into cultivation as agriculture is the only option left for the increasing unemployment. Horticulture and other cash crop cultivation need to be encouraged along with the marketing facilities. Logging and fire wood collection are another big factor for forests degradation in the state. Despite of banned by the state government logging continues in a big scale. Most of the virgin forest in the hill are depleted to met the high demand of sawmills in the foothills. Firewood is the main fuel for rural population but the demand for firewood is increasing even in urban area. The high rate of firewood consumption in urban areas can be minimised by increasing the supply of LPG. Forest fire in the state is a frequent occurrence as fire goes beyond control during Jhum field burning. Some tribes have a tradition of burning forests. Forest resources degradation in the state can be attributed to Article 371(A) of the India Constitution which empowered Nagas authority over the land and its resources. There is an urgent need to educated people both in urban and rural area about the importance of wise utilisation of forests resources. In the absence of action plan to managed forest resource in Nagaland, forests in the state will face crisis.

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