

FOREST RESOURCES AND ITS MANAGEMENT IN ARUNACHAL PRADESH – AN INTROSPECTION

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Abstract

Forests in North-East India have always been a life supporting resources that sustain many poor people who are dependent their life on forest products. It plays an important role in the hilly areas of the indigenous people that influences the life and lore of the people as well as interacting variously in the management of other natural resources like land and water. Besides, the region is characterized by rich in biodiversity and ethnical diversity where forest have been playing a different role that yield two distinct flows of goods fundamentally different in nature: flow of private good such as timber, fuel wood, other minor forests produce and a flow of public goods like maintenance of environment, causation of rainfall, prevention of soil erosion, etc. This ecology of rich flora and fauna of the forest have been catering to the emotional and aesthetic as well as recreational needs of the tribal who dwell in and around the forests. However, there is a growing concern over these two types of goods over the sustainable use of forest resources and livelihood issues of the forest dependent communities. Hence in this paper an attempt is made to explain the present status of forest resources and its sustainable management in context of Arunachal Pradesh.

Keywords: Hilly areas, Natural resources, Sustainable management.

INTRODUCTION

Forests in North-East India have always been a life supporting resources that sustain many poor people who were dependent their life on forest product. It plays an important role in the hilly areas of the indigenous people that influences the life and lore of the people as well as interacting variously in the management of other natural resources like land and water. Besides, the region is characterized by rich in biodiversity and ethnical diversity where forest have been playing a different role that yield two distinct flow of goods fundamentally different in nature: flow of private good such as timber, fuel wood, other minor forest produce and a flow of public goods like maintenance of environment, causation of rainfall, prevention of soil erosion, etc. This ecology of rich flora and fauna of the forest have been catering to the emotional and aesthetic as well as recreational needs of the tribal who dwell in

and around of the forest. However, there is a growing concern these two types of goods over the sustainable use of forest resources and livelihood issues of the forest dependent communities. Hence, a compromise has to be brought between the demand for private goods and that for public goods from forest for achieving sustainable development in Arunachal Pradesh (Mitra, 2002) and here lies the importance of effective forestry planning in a hill state like Arunachal Pradesh.

The present paper makes an in-depth study about the need for an effective approach on forestry planning. The paper is divided into three sections. The first section concentrates on distinct features of forests in the North Eastern region of India in general and Arunachal Pradesh in particular. The second section devotes to the status of forest coverage of Districts of the state. The third section deals with an alternative approach of forestry

planning of the state and finally the conclusion follows.

Section-I

As per the estimates of the forest survey of India, 2017 based on satellite imagery, forest area consists of around 79.96 % of the total area of the state, out of which 77.17 % consists of very dense forest (all lands with tree canopy density of 70 % and above), 22.83 % consist of moderately dense forest (all lands with tree canopy density of 40 % and more but less than 70 %) and 22.50 % consist of open forest (all lands with tree canopy density of 10 % and

above but less than 40 %). An analysis reveals that in around 2.5 percent of India's land mass, the state of Arunachal Pradesh contains nearly 16 percent of total timber growing stock of the country (the highest among the individual states) and more than 30 % fauna of India (Basic Statistics of North Eastern Region, 2015).

An attempt is now made to examine the position of Arunachal Pradesh in terms of total forest coverage among the North Eastern states of India on the basis of latest satellite data. The details are furnished in Table 1.

Table 1: Forest coverage in North Eastern states, 2017 (area in km²)

State	Geographical area	Very dense forest	Moderately dense forest	Open forest	Total forest	Change in forest area from 2013
Arunachal Pradesh	83743	20721 (30.94 %)	30955 (46.23 %)	15288 (22.83 %)	66964 (79.96 %)	-357
Assam	78438	2797 (9.95 %)	10192 (36.26 %)	15116 (53.78 %)	28105 (35.83 %)	434
Manipur	22327	908 (5.23 %)	6510 (37.53 %)	9928 (57.24 %)	17346 (77.69 %)	356
Meghalaya	22429	453 (2.64 %)	9386 (54.74 %)	7307 (42.62 %)	17146 (76.45 %)	-142
Mizoram	21081	131 (0.72 %)	5861 (32.23 %)	12194 (67.05 %)	18186 (86.27 %)	-868
Nagaland	16579	1279 (10.24 %)	4587 (36.73 %)	6623 (53.03 %)	12489 (75.33 %)	-555
Sikkim	7096	1081 (32.33 %)	1575 (47.10 %)	688 (20.57 %)	3344 (47.13 %)	-14
Tripura	10486	656 (8.49 %)	5246 (67.90 %)	1824 (23.61 %)	7726 (73.68 %)	-140
Grand Total	262179	28026 (16.36 %)	74312 (43.38 %)	68968 (40.26 %)	171306 (65.34 %)	-1286

[Source: India State Forest Report, 2017]

Out of eight North Eastern states, Mizoram has the highest forest coverage (86.27 %) followed by Arunachal Pradesh (79.96 %). However, if we look into the composition of forests, Arunachal Pradesh has the highest

dense forests in the region (30.94 % and 46.23 % of total forest cover as very dense forest and as moderately dense forest respectively) whereas the Mizoram has the lowest dense forest (0.72 % and 32.23 % respectively).

Table 1 also shows that all the North Eastern states except Assam and Manipur (with a gain of 434 km² and 356 km² respectively) lost the forest coverage in between 2013 to 2017. In fact, during this period India gained a forest area of around 10,375 km² but North Eastern region lost the forest area of 1,286 km².

In Arunachal Pradesh, the ownership of land as well as the forest land and the individual right to use it are governed by local traditions and custom of the tribes. Under the prevailing land tenure system, there are three types of land ownership namely [a] community land [b] clan land, and [c] individual land. Regarding the forest land, almost all the tribes have the community forest which is controlled by the village council. In some areas, clan ownership is recognized in the forest areas falling within the village jurisdiction. That is why if we look at the data on the basis of legal status of forest in the state, it is found that around 60.11 % of total forest is under community ownership which is reported as Unclassified State Forest (USF) (Table 2). However, at present there is a growing tendency of individual ownership of forest which is a recent phenomenon in the state. For example, in the Apatani plateau of Lower Subansiri and other Districts in the state, the forest has become increasingly privatized.

The reserve forest, National Parks and Wild Life Sanctuary constitutes of 10089.39 km², 2290.82 km² and 7487.75 km² respectively, i.e. nearly 19.54 %, 4.44 % and 14.58 % of the total forest area respectively of the state. However, there is a steady increase in reserve forest as compared to 1950, when there was only 526 km² of reserve forest in the state. On the other hand, Anchal Reserve Forest covered only 325.13 km² (only 0.63 % of the total forest area). Such forests are managed by the forest department with the provision for sharing the net revenue in the ratio of 50:50

(share of village: share of Government). However, the USF remained the highest (60.22 %) where there is community ownership. A much referred to problem with common property resources is the ‘tragedy of commons’ (Bhattacharaya, 2001). Whenever any of the set of rules and regulation is violated, individual choices prevailed over the social choices. This is exactly what happened in Arunachal Pradesh. This is clear when we look into the table 3 which shows that there is steady reduction of dense forests in Arunachal Pradesh from 1987 to 2017.

Table 2: Classification of forest in Arunachal Pradesh in 2017 (legal status)

Legal Classification	Area (km ²)	Recorded Forest (%)
Reserved Forests	10089.39	19.54
Protected Forests	7.80	0.02
Anchal Reserve Forests	325.13	0.63
Village Reserve Forests	504.923	0.98
National Parks	2290.82	4.44
Wild Life Sanctuary	7487.55	14.58
Orchid Sanctuary	100.00	0.19
Unclassified State Forests	30707.38	60.22
TOTAL	51640.00	101.00

[Source: Forest Statistics of Arunachal Pradesh, 2017]

Section – II: Forests in Arunachal Pradesh

Arunachal Pradesh, the erstwhile North East Frontier Agency (NEFA) has been identified as one of the world’s ecological Hotspot (Myers, 1988). With its abundance of forest cover, the state is endowed to such a high percentage of valuable forest cover. It is the largest in North Eastern India covering a geographical area of 83,743 km², which

constitutes 2.55 % of the total area of the country. Physiographically, the state is divided into three zones namely lower hills, lesser Himalayan range and the great Himalayan range.

Table 3: Dense and open forest cover in Arunachal Pradesh

Year	Total forest km ²	Dense forest		Open forest	
		km ²	%	km ²	%
1987	60500	51096	84.46	9404	15.54
1989	68763	54272	78.93	14491	21.07
1991	68757	54542	79.33	14215	20.67
1993	68661	54510	79.39	14151	20.61
1995	68621	54176	78.95	14445	21.05
1997	68602	54155	78.94	14447	21.06
1999	68847	57756	83.89	11091	16.11
2001	68045	53932	79.26	14113	20.74
2003	68019	53511	78.67	14508	21.33
2005	67777	52388	77.29	15389	22.71
2007	67353	52414	77.82	14939	22.18
2011	67410	52387	77.71	15023	22.29
2013	67951	52242	76.88	15709	23.12
2015	67248	52105	77.48	15143	22.52
2017	66964	51676	77.16	15288	22.83

[Source: India State Forest Report, 2017]

Though India's tree and forest cover has registered an increase of 1 % or 8,021 km², in two years since 2015, there has been a substantial decrease in Arunachal Pradesh forest cover during that period, according to the latest assessment by the government. With a 190 km² decrease in forest cover, Arunachal Pradesh is among the five North Eastern states where forest cover has decreased the most (ISFR 2017).

Based on satellite imagery recorded in 2015, the state has 66,964 km² forest area which is about 79.96 % of the State's geographical area. However, in terms of density classes, the state has 77.17 % under very dense forest and 22.83 % under open forest. An attempt was made to analyse the

coverage of forest based on satellite images among different Districts of the state depending on availability of data. The details are given in table 4.

Papum Pare has the highest forest coverage (92.17 %) followed by East Kameng and West Kameng (88.94 %) in terms of forest coverage to total geographical area. However, if we look into the composition of forests, Kurung Kumey and Lower Subansiri have the highest dense forest (includes very dense and moderately dense forest) in the region (73.35 %), whereas the Tawang has the lowest dense forest (36.33 %). Similarly, in open forest, Tirap has the highest among all the Districts of the state (22.06 %) and the lowest is shown by

Lohit and Anjaw (14.40 %) as per the Indian State Forest Report, 2017. The relatively high share of open forest in Tirap is a cause of concern for the environmentalist. The degradation of forests is primarily due to

intensive shifting cultivation, illegal felling of trees, infrastructural development, forest conversion for permanent pasture and other allied activities.

Table 4: District wise forest coverage in Arunachal Pradesh (2017)

Districts	Total forest area (%)	Dense forest area (%)	Open forest area (%)
Changlang	85.63	67.05	18.58
Dibang Valley & Lower Dibang Valley	70.86	50.78	20.08
East Kameng & West Kameng	88.94	70.09	18.85
East Siang	79.93	59.64	20.29
Kurung Kumey & Lower Subansiri	87.79	73.35	14.44
Lohit & Anjaw	66.66	52.26	14.40
Papum Pare	92.17	71.49	20.68
Tawang	54.19	36.33	17.86
Tirap	81.92	59.86	22.06
Upper Siang	81.47	60.94	20.53
Upper Subansiri	79.22	62.91	16.31
West Siang	88.36	67.33	21.03
Grand Total	79.96	61.71	18.26

[Source: Indian State of Forest Report, 2017]

Section – III

The experience of Arunachal Pradesh shows that the private goods which the forest yields got more priority particularly as the initial stage. This may be due to the fact that the public goods which the forest yields are of such a nature that the benefits of their presence or the harms caused by their absence are felt slowly in the long run. At the same time, it should be noted that the forest has externalities but essentially it is a resource (Ganguly, 1986). Tribal economy of the state is intimately connected with the rich in forest bio resources where tribal communities have ethnic and cultural diversity associated with the demography of the state. However, over the years, state's biodiversity has come under treat

at an alarming rate. Though, as forest must be protected to conserve soil, environment, wildlife and bio-diversity at the same time the demand for resources yielded by forest is expected to grow along with the growth of population and economic development in order to satisfy direct human wants and requirement of the forest based industries and construction activities. Therefore, an effective planning for forestry development in Arunachal Pradesh should take into account the following consideration.

Control of Indiscriminate Destruction of Forest

It is found that accessible natural forests particularly in the foothills of Arunachal

Pradesh are under great pressure to a large scale due to extraction of timber and illegal felling of trees. Although the demand for wood for local consumption is relatively low due to low population of the state but in view of the increasing demand for industrial timber within the state and other parts of the country, the forest in the state are under great pressure. As per the official estimate, the state contributes to nearly 50 percent of the timber supply made from the North Eastern region of India. The tree permit system in unclassified state forest (U.S.F.) which was introduced to enable the local people to earn their livelihood in logging and extraction of timber with a view to generate income led to the emergence of a 'neo-rich' class in the traditional tribal society in collaboration with private forest contractors. There is a growing social and political pressure to over exploit the forest and the protection of forest are becoming increasingly difficult.

Moreover, the forest located particularly along the inter-state border with Assam and Nagaland are mainly prone to illegal felling and smuggling of timber. Some illicit felling is also reported in the forest adjacent to the tributaries of the Brahmaputra River and the logs are thrown into the river which is collected in the downstream of Assam plains for sale to saw and veneer mills in different parts of the country. The state forest department finds itself ill equipped to fight such timber poachers and smugglers and contain this menace due to the limited resources available with it for protection of forest. For example, only Rs. 300.00 lakhs were allotted for forest protection during the Tenth Five Year Plan. Therefore, there is an urgent need to protect the rich forest resources of the state by firmly dealing with such organized gangs indulging in illicit tree felling and also by controlling the indiscriminate destruction of forest in unclassified state forest.

Control of Shifting Cultivation

Shifting cultivation ('jhum') is one of the factors adversely affecting the forest conservation efforts in North-Eastern states in general, and Arunachal Pradesh in particular. Jhumming is mainly practiced in the USF areas in Tirap, East Siang, West Siang, Lower Subansiri, Upper Subansiri, Papum Pare and East Kameng. Population wise around 54,000 families are practising shifting cultivation in the state (North Eastern Council, 2006). Thus, the dominance of shifting cultivation in the whole economy is quite evident. At the same time, it is a well-known fact that much of the forest land in the state is lost due to shifting cultivation. For example, according to Forest Survey of India, 2015, there was a net decrease of forest area in Arunachal Pradesh by around 73 km² and out of these a major portion is lost due to the shifting cultivation. Forest gets denuded when old jhum land is left uncared for and new land is taken for jhum. The danger of ecological imbalance due to deforestation looks large when the claim for such new land soars up with the growth of population. Hence, in order to save forest and to control environmental degradation, most social scientists and environmentalist agree that the shifting cultivation has to be reduced. Efforts have to be made for better utilisation and scientific management of jhumland regeneration of forest in abandoned jhumland and a greater stress on horticultural crops, which lies in the border line of forestry and agriculture.

Emphasis on the Role of Non-Governmental Organisation

One of the important components of effective forestry planning is involving the people in the protection and regeneration of forest because forest can never be protected unless the people are made to feel that they

have a say in the matter. This is why there was a major change in forest policy in 1988 which envisaged people's involvement in the development and protection of forest. The policy stressed that it is one of the essentials of an effective forestry planning that the forest communities should be motivated to identify themselves with the development and protection of forests from which they derive benefit. In the pretext of change in forest policy in 1988, the idea of Joint Forestry Management (JFM) came and it was adopted by various states of the country. However, the JFM model will require suitable modifications to be workable in the hill state like Arunachal Pradesh where 60.11 % of the total forest areas are mainly under the traditional ownership of local village committees. At the same time, there is enough scope to shift focus from government forests by bringing more virgin USF to J.F.M. network (Mitra, 2002). It should be noted that unless social consciousness about forest promotion and conservation do not grow or revive among the people, the Government's efforts will be of no use. It is the NGOs, who can motivate people at the level.

Strengthen the Community Forest Management System

Like other states of tribal dominated areas in India, Indigenous Community Institutions play an important role in managing village society and natural resource use. Local communities manage the forest resources on the basis of traditional and customary laws while the concern forest department regulates the laws through the national and state policies. However, Indigenous Community Institutions are under pressure and receive little external support from the government. There is a gap between the state policies and traditional rule to conserve the forest resources due to their complexity, diversity and their varied constitutions, composition and function. The

traditional ways to manage the forest resources is obtain un-written and un-registered making it difficult for the forest official to recognized them and develop supportive interventions accordingly. It leads constrain the inflow of financial and technical support. So, it needs to encourage community network and more guidance in developing forest policies at grassroots level that support community forestry rather than the policy based on the national forest policies which do not reflect the needs and legal rights of local communities. It required appropriate and supportive policy reforms in government programme and scheme. There is to strengthen the Indigenous Community Institution and at community level to enable them to function in a democratic and transparent manner.

Encouragement of Joint Forest Management

In Arunachal Pradesh the Joint Forest Management tries to provide the benefits to local communities residing in an around the forest area in return for assistance to conservation, protection and regeneration of forest. Government of India tries to provide series of schemes, programme and policies like Apanavan Scheme, formation of Village Forest Management Committees (VFMCs) to mobilize at village level. However, this top-down driven national scheme has frequently failed to address the needs of the local community and land use need and practices. It seems to be difficult to face management problem by the rural communities with the scheme provided by the centre through Joint Forest Management. It need to be work collaborate to support community forestry area and assist them to develop management plans an activities. Programme should be formulated in consonance with the local jhum and resource use norms by incorporating indigenous knowledge and institution by understanding local ecosystem linkages, problems and

traditional practices. Effort should be made to cover especially in the regeneration of forests on degraded land should be encouraged with sharing of benefits. Therefore, the Joint Forest Management needs to be reoriented at both the policy implication as well as ground level to reflect the differences, support the community forest management and create incentive for sustainable management.

Encourage local people to develop alternatives to Jhuming

Apart from timber base forest products, suitable and specific need based agro-forestry practices should be promoted. In order to reduce the pressure on forest cover, large area of the state should be covered under plantation crop like rubber and tea. The cash crop like ginger, turmeric and spices should be encouraged. In addition to this, low volume and high medicinal value of plants like piper and cardamom should be encouraged. In order to provide livelihood opportunities to the local communities, it needs to establish of small-scale industries based on Non-Timber Forest Product. One such area that has enormous potential is bamboo and cane.

Organize Awareness and Training on Conservation of Forest

Both at village community as well as the government staff require awareness and developing skill programme for the conservation of forest resources. Proper training and awareness programme needed to interaction and exchange of experiences among the villagers involved in community forestry. So, it needs to address the importance of rich biodiversity and social forestry to develop through promotion of nature-based tourism in the state. Resource mapping to identify the endangered species must constitute an integral part of the biodiversity strategy. The involvement of local people in documenting

indigenous base knowledge for posturing can go long way in creating awareness and protection the environment and forest resources.

CONCLUSION

We find from the experience of Arunachal Pradesh that rapid annual growth of population and a strong desire for the improvement in the standard of living in this state (where a good percentage of population are poor) have resulted in a lack of sustainability in the use of forest resources. At the same time during the planning period, the private goods which the forest yield got more priority in the name of modern development. In fact, the development of the state through industrialization does not mean the mushrooming growth of the forest-based industries and over exploitation of forest resources. The state can also be developed through setting up of fruit processing industries and through promotion of nature-based tourism in which the state has enough potentiality, provided certain infrastructural facilities are built up. Forests used to contribute a major source of total revenue from the local source to the state exchequer, in which around 85 % of its total budgetary expenditure comes from the centre in the form of grants-in-aid. The situation has worsened with the royalty of forest products declining due to the Supreme Court's interim order banning of felling of trees in mid-nineties. Hence, alternative internal resources and employment opportunities have to be created within the state itself and the promotion of nature-based tourism appears to be the best way in this respect which is considered the least ecologically disturbing industry in hill regions (Mitra, 2003). In fact, under the present circumstance a vigorous study is required to make the people aware of how additional income and employment can be generated locally due to the existence of forest resources by promoting ecotourism which may

also help to conserve the forest resources. In fact, the flow on academic thinking on forestry has been always directed towards issues like timber demand, survival of forest-based industries or sustainability and biodiversity. However, very few studies have been stressed on the valuation of recreational aspects of forests in the context of India and it is urgently required, particularly in the context of Arunachal Pradesh in order to conserve the rich forest resources of the state.

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