



SUSTAINABLE DEVELOPMENT OF AGRICULTURE AND FORESTRY PLANNING IN ARUNACHAL PRADESH

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Abstract

Sustainable development in agriculture is closely connected with the development of forestry in a hilly state of Arunachal Pradesh where around 61.5 percent of geographical area is under the forest coverage based on satellite imagery. Forest may be regarded as capital stocks which yielded two distinct forms of private and public goods. The private goods like fuel woods, timber, house building materials, other minor forest produce, etc. However, there is a conflict between these two types of goods. Given the quantum of forests, greater the extraction of private goods, the less will be the availability of public goods in the form of environmental benefits. So, a compromise has to be brought between the demand for private goods and that of public goods from the forests for balanced and sustainable socio-economic development of Arunachal Pradesh with the help of effective forestry planning in Arunachal Pradesh. In this paper, an attempt has been made to analyse the relationship between the development of agriculture and forest and its contribution to state's economy on the basis of secondary data.

Arunachal Pradesh is situated in the extreme North-East part of India. Geographically the state lies between 26° 28'N to 29° 38' N latitudes and 91° 30'E to 97° 30' E longitudes with total area of 83,743 km². It is the largest state among the North-Eastern States consisting of about 2.55 per cent of the total geographical area of the country. The State of Arunachal Pradesh has common international boundary with China in the North and North-East (1,080 km), Myanmar in the East (440 km) and Bhutan in the West (160 km). It also shares a common boundary with Nagaland in the East and South-East and Assam in the South. Greater portion of the state falls in the outer Himalayas and Patkai range. The innumerable rivers and streams in the state flow into the Bramaputra river in Assam. The major rivers of the state are Kameng, Subansiri, Siang, Lohit, Diyum and Dihang. Geologically the state consists of mainly shale, schist and conglomerates of the Himalayan system and is comprised of mountainous territory, situated on the South slopes of the Eastern Himalayas.

Out of the total geographical area of nearly 83,745 sq.km of Arunachal Pradesh, 51340 sq.km is estimated to be under forests. However, as per the recent estimate of the Forest Survey of India based on satellite imagery, forest area in the state is about 68,661 sq. km (6725 sq. km as per 2012 census) which constitutes nearly 80.99 percent of the total area of the State. The detailed classification of forests in Arunachal Pradesh is shown in Table-1

Table-1
Classification of Forests in Arunachal Pradesh in 1990-91 (Legal Status)

| Sl.No. | Legal status of forest | Area in sq. km | % of total forest area | % of total geographical area |
|--------|---------------------------|----------------|------------------------|------------------------------|
| 1 | Reserve forests | 19236.55 | 37.32 | 22.97 |
| 2 | Anchal forests | 256.08 | 0.05 | 0.30 |
| 3 | Protected forest | 7.79 | 0.01 | 0.01 |
| 4 | Unclassified state forest | 32,038.00 | 62.17 | 38.27 |
| | Grand total | | 100.00 | 61.55 |

Source: Compiled from Arunachal Pradesh Forest, Environment and Forests Department, Govt. of Arunachal Pradesh, 1993

Table-1 shows that the reserve forests estimate nearly 37.32 percent of the total forest area of the state which is a steady increase in reserve forest area as compared to 1950, which there was only 562 sq.km (11.9 percent of total forest area of the state) and in 1979-80, it increased to 11,422 sq.km (22.17 percent of total forest area of the state). However, the question is that such an expansion of reserve forests may have an impact on the jhumias of the state who may be forced to shift to other places as it happened in the case of Tripura (Chakravarti, 1986, p. 39) The vast area of forest which is known as unclassified state forest (62.17 percent of total forest area of the state). This is the forest on which local people claim absolute right and the state also claims ownership rights. The official position with regard to land in jhum cultivation is embodied in jhum land regulation of 1942. The Act has recognized customary rights of the tribals over land. The Act has an important bearing on the ownership of forests and forest land not being used for jhuming. However, the government amended the forest Act in 1955 and recognized the rights of local tribesmen to collect firewood, bamboos, cane, etc, even from reserve forest but with limited rights for hunting and fishing. Thus, the tribes have ownership of land and forest in Arunachal Pradesh. Hence, vast tracts of land are now being claimed as individual property where even other villages are denied entry (Roychowdhury, 1992).

The Anchal reserve forests covered only 256.08 sq. km (only 0.50 percent of total forest area). Such forest is managed by Forest Department with the provision for sharing the net revenue in the ratio of 50:50 between the village and government. Thus, the creation of anchal reserve forest in 1975 has intensified the overall management of forestry in Arunachal Pradesh because such schemes are expected to provide both direct and indirect benefits to the local people and scientific coverage of forest management to wastelands as well as anchal samity lands.

The forest plays a significant role in the ecology, economy and socio-political life of the tribes of Arunachal Pradesh. It is an important source of income of the state. The vegetation in Arunachal Pradesh can be broadly categorized as (a) Temperate forests from 9000 feet to 12,050 feet and higher up alpine meadows merging to vegetation less snow-clad peaks, (b) Humid sub-temperate forests from 6000 to 9000 feet, and (c) Sub-tropical forests from 3000 to 6000 feet and tropical semi-evergreen forest in the foothills adjacent to the Bramaputra valley up to about 3000 feet (Bharatakur, 1972). Forest cover accounts for 61.54% of total geographical area of the state in 2014. The forest areas in Arunachal Pradesh have been classified into four categories (a) Reserved forests including sanctuaries and national parks (b) Anchal reserved forest (c) Protected areas (d) Unclassified state forests. The Table-2 gives a brief account of the forest area in the state.

Table-2
Forest Area in Arunachal Pradesh

| Sl. No. | Legal Status of Forest | Area in km ² | % of Total Forest Area | % of Total Geographical Area |
|---------|------------------------|-------------------------|------------------------|------------------------------|
| 1. | Reserved Forest | 10089 | 20 | |
| 2. | Wildlife sanctuary | 7488 | 15 | |
| 3. | National Parks | 2290 | 4 | |
| 5. | Anchal Reserved Forest | 625 | 1 | |

| | | | | |
|----|---------------------------|--------------|---------------|--------------|
| 6. | Protected Forests | 8 | 0.02 | |
| 7. | Unclassified state forest | 31039 | 60 | |
| | Grand Total | 51539 | 100.00 | 61.54 |

Source: Principal Chief Conservator of Forest, Itanagar, A.P. 2014.

Forest play an important role in the socio-economic life of the people of the State. This is evident from the fact that the contribution of forestry to the net state domestic product is much higher 8.47 percent than the all India average of less than 2 percent in 1991-92 at 1980-81 prices. The contribution of forestry to the NSDP went up quite high in the early eighties but since then the contribution has been decreasing which may be due to conservation oriented policy of natural resources, inadequate funds for creating man made forestry, etc.

The state domestic product of Arunachal Pradesh has been estimated at factor cost by industry origin at current prices. During 2012-13, the primary sector contributed 45 per cent of Arunachal's NSDP while the secondary sector contributes only 25 per cent of the NSDP and the tertiary sector contributes about 30 per cent of the NSDP (Table 3). The state domestic product of Arunachal Pradesh is dominated by agriculture. The contribution of agriculture to Net State Domestic Product (NSDP) alone is 28 per cent. The contribution from the fishery is the lowest at only 0.44 per cent to the net state domestic product during 2012-13.

Table-3

State Domestic Product of Arunachal Pradesh at Factor Cost by Industry Origin at Current Prices (2012-13) (Rs. in Lakh)

| Sectors | GSDP at Current Prices | NSDP at Current Price | Contribution of Sectors to GSDP (%) | Contribution of Sectors to NSDP (%) |
|--|------------------------|-----------------------|-------------------------------------|-------------------------------------|
| 1.Agriculture | 326927 | 317369 | 27 | 28 |
| 2.Forest & Logging | 175687 | 173605 | 14.5 | 15 |
| 3.Fishing | 5405 | 4610 | 0.45 | 0.44 |
| 4.Mining & Quarrying | 20293 | 14126 | 1.68 | 1.56 |
| A. Primary Sector (1+2+3+4) | 528312 | 509710 | 44 | 45 |
| 1.Manufacturing | 21592 | 21208 | 2 | 2 |
| 1.a Registered | 0 | 0 | 0 | |
| 1.b Un-Registered | 21592 | 21208 | | |
| 2.Construction | 237025 | 224635 | 20 | 20 |
| 3.Electricity,Gas and Water supply | 60472 | 33606 | 5 | 3 |
| B. Secondary Sector (1+2+3) | 319089 | 279449 | 27 | 25 |
| 1.Transport, Storage | 25241 | 23598 | 2 | 2 |
| 1.a Railways | 26 | 15 | | |
| 1.b Transport by other means | 20504 | 19711 | | |
| 1.c Storage | 63 | 60 | | |
| 1.d Communication | 4648 | 3812 | | |
| 2.Trade, Hotel & Resturant | 43888 | 43254 | 4 | 4 |
| 3.Banking & Insurance | 28094 | 27688 | 3 | 2 |
| 4.Real Estate | 18378 | 16330 | 2 | 2 |
| 5.Public Administration | 134949 | 113315 | 11 | 10 |
| 6.Other services | 111174 | 108470 | 9 | 10 |
| C. Tertiary/Service (1+2+3+4+5+6) | 361724 | 332655 | 29 | 30 |
| Total | 1209125 | 1121814 | 100 | 100 |

Source: Statistical Abstract, Directorate of Economics and Statistics, Itanagar, Govt. of A.P. 2013.

The development of forestry at the national level did not receive much attention during the first two plans. The main thrust of national forestry planning during the next four-five year plans was mainly on (a) large scale plantation of industrially valuable species. (b) enlargement of social forestry including farm forestry and (c) linking forestry development with the economy of the people.

Forestry planning in Arunachal Pradesh slowly evolved and enunciated at the national level. Before the Third Plan, no serious attempts were made for the development of forestry in Arunachal Pradesh. However, attempts were made during these three plans to control deforestation and to restore the forest by afforestation but the efforts were rather modest. From the Sixth five year plan, stress was laid on social forestry, farm forestry etc. Social forestry is basically a people's movement because the growing of trees on land, not held by Forest Department, depends on the people's response to it. The concept of 'Apna van' scheme received wide and enthusiastic acceptance up to 1992-93, a total area of 6,106 hectares of plantation have been raised under this scheme with a target of 1650 hectares in 1993-94. (Government of Arunachal Pradesh, 1993, p.39).

It has been found from the experienced in the context of Arunachal Pradesh that the private goods which the forests yield get more priority particularly at the initial stage. This may be due to the fact that the public goods which the forests yields are of such a nature that the benefits of their presence or the harms caused by their absence are felt slowly and only in the long run (Bhattacharjee 1985, p. 56). At the same time it should also be noted that forest has externalities but essentially it is a resources (Ganguly, 1986, p.126). Even as forests must be protected to conserve soil, environment, wild life and genetic pool, at the same time resources yielded by forest should be used in growing quantum for satisfying direct human wants and requirements of industries and constructive activities which are expected to grow along with economic development. So an effective forestry planning should try to minimize the conflict between the demand for private goods and that for public goods from the forests. Therefore, effective planning of forestry for sustainable development of agriculture assumes greater significance in view of the fact that the population of the state has been growing at a rapid rate, the annual exponential rate of growth of population being more than three percent. The per capita income of the state is increasing at a moderately high rate. These two factors that is-a growing population and a rising income are mainly responsible for the rapid expansion of the demand for both agricultural and forest products. Hence, the demand for land is on the increase. Consequently escalation of land prices has acted as incentive to convert forest land into agricultural land to both jhum and permanent.

Conclusion

It is found that there is a conflict between agricultural expansion and forestry development as long as shifting cultivation is concerned. However, as a result of low return from the jhum cultivation, farmers are shifting to the permanent agricultural cultivation for its sustainable development. The alternative sources of income for growing population should also be explored so that pressure on land is minimized and eco-friendly industries such as electronics, watch making, etc. are developed. As such appropriate training should be imparted to the local people to equip them with necessary skills so that they can be employed in such industries. Thus, the joint forestry management system should be introduced while giving necessary budgetary support from the state government for its promotion and role of NGOs should be recognized. There is increasing contribution of agriculture to the state GDP in the growing economy of the state in Arunachal Pradesh.

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