DIMENSIONS OF Rural Development in North-East India

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PREFACE

Rural development in most of the developing countries has remained an illusive agenda. The urban bias inherent in the process of market-led growth calls for state activism in order to counter the market imperfections and failures to boost up the rural economies. The enclave nature of growth in the developing countries including India has significantly widened the rural-urban disparity in terms of economic opportunities and basic minimum services that people value in their life. In fact, the urban civilization is outpacing its rural counterparts at lightening speed. Besides economic opportunities, the image of urban culture is also increasingly pushing the age old rural heritage out of the cultural consciousness of the nations.

Since independence India has evolved an elaborate institutional framework to look after the developmental needs of the rural sector. This institutional structure, through which the programmes designed specifically for rural development are executed, has also undergone changes over time. From Community Development Block approach, emphasized during the 1950s and 60s, to Panchayati Raj since the 1990s. Besides the shifts in implementing institutional units, more and more content has also been added to the programmes of rural development over time in order to tackle the widening urban rural disparity.

The heterogeneous impact of the rural development programmes upon the spatio-temporal plain calls for their area specific evaluation. This book, the outcome of a seminar on "Rural Development, Small Industries and Peoples' Participation in North East India", held on December 10-11, 2001, organised by The North eastern Council for Social Science Rese arch (NE IC S S R), at Shillong, attempts to assess the state of sectoral development of the rural economies, impact of the rural development programmes, functioning of the implementing agencies and peoples' participation in them in the North Eastern Region.

B. Datta Ray
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RURAL DEVELOPMENT: Need for Agricultural and Small Scale Industrial Development in North-east India

A. K. Agarwal

Almost all underdeveloped countries are characterised by lack of employment opportunities, especially in the rural areas and India is no exception. As in most developing countries the trend rate of growth in India has been higher in the modern industrial and service sectors both of which are urban based - than in the agricultural sector (Chenery and Syrquin, 1986). There has been much debate about how much India's poor have shared in the country's economic growth. The optimism of many of Indian post independence planners, who believed that the country's (largely urban based) industrialisation would bring lasting long term gains to both the urban and rural poor, has not been shared by many critics. Revallion and Datt (1996) noted that growth in both primary and tertiary sectors was poverty reducing, the tertiary sector generating a larger impact; though the difference between the two sectors is not significant. By contrast secondary sector growth had no significant impact on the rate of poverty reduction in either urban or rural areas. Fostering the conditions in the rural economy in both primary and tertiary sectors must thus be considered central to an effective strategy for development and poverty reduction in India. Growth and diversification of production through new technology and managerial skill has had big impact.

Development in backward countries, necessarily implies rural development which is by and large a comprehensive issue to be conceived and attempted, considering the complexities and vastness of rural scenario special efforts are necessary to tackle the problem, especially of the rural poor (Agarwal, 1996). Such development encompasses growth, improvement in equity, health care, nutrition, education and ecological balance. Thus rural development includes an overall development of the rural population.

Agriculture and Rural Development

Agriculture plays a unique role as a supplier of food and its importance lies to the welfare of the farmers and others in the rural population, and its role in the economic development. As economies develop the share of agricultural labour to total labour falls to 2 to 3 percent. In that way off-farm migration helps the development of the rest of the economy. As more people leave agriculture, the economic base on non-agriculture increases, boosting migration rates. But as labour leaves agriculture, labour productivity in agriculture increases, income differentials falls and migration declines. So off-farm migration leads simultaneously to an increase of income in the rural sector and to development of non-agriculture. This process takes a long time to complete, however (Larson and Mundlak: 1995).

About 70 percent of the area of North-East is hilly and mountainous accommodating about 30 per cent of the regional population. The rural population of North-East is essentially of peasant farmers. Farming system in the hills is dominated by age-old primitive method of shifting cultivation or slash and burn method. The average annual operational area under *jhum* cultivation is between 1 to 1. 5 hectare per family (Maithani, 1995). With rapid increase in population over the years, fallow period has been reduced from 10 years and more to 3 to 4 years, in most hill areas. As a result of high population density in the valley (the main producing areas of the region) the land holding size has been reduced to uneconomic levels, e.g., more than 80 per cent of farmers in Assam are small farmers and above 60 per cent of holding is of less than 1 hectare size. The galloping population has increased pressure on the land resources resulting in widening of disparities both between and within communities as clans who traditionally had less access to land are most under pressure. The region is net importer of foodgrains from neighbouring states estimated at 1.5 million tons annually, huge quantity of animal protein and other consumer goods.

Natural vegetation represents an important factor of production in the context of shifting cultivation. Over-exploitation of this factor may cause significant loss of income among rural communities. The long fallow period plays important role of replenishing the fertility of the land by allowing natural vegetation to grow which is incorporated into the soil as natural fertility (Usually as ashes after burning) at the time of cultivation. The short fallow period due to population pressure leads to insufficient growth of natural vegetation and consequently to low soil fertility, soil instability, flooding and sliding. Thus the rich vegetation during a long fallow period is a form of capital that accumulates and is eventually used at the time of cultivation. The closed forest areas (undisturbed by cultivation) also play important protection against soil erosion, watershed destruction and flooding.

The growing pressure of population requires expansion of the cultivated land either by diminishing forest land or by reducing the length of the fallow periods. Both the phenomenon are present in the north-east. An increase in land size under cultivation has a direct output-increasing effect at the cost of reducing the natural capital, thus reducing agricultural productivity. An optimal fraction of the land should be cultivated in order to maximise social income. If the level of land cultivated is above or below the optimum, income is reduced. Since the biomass is an important factor of production, the large losses of forest and the considerable reduction in fallow periods over the past few decades have implied a considerable loss of productive natural capital that is likely to have reduced by productivity of labour and other resources.

The village ownership or community ownership of land provides the farmers exclusive rights on the land usually for as long as they cultivate it. Individual cultivators act as if the biomass resource has no social costs beyond the purely private costs clearing the land. They try to over exploit the natural resources by cultivating too much. In deciding how much land to cultivate, farmers in this case are likely to consider only the private costs, ignoring contemporary and inter-temporal effects on other cultivators.

In case of adequate community controls, individuals would behave as if they fully accounted for both the private and social costs of clearing land. This part is well taken care by the villagers while going for allotment of jhum land for cultivation to the individuals but still some scope of clearing forest land can not be ruled out causing

diminishing of the forest lands. Further; the individual cultivators are not prone to use usually expensive substitute inputs, i.e., chemical fertilisers, for natural vegetation (and thus increase land productivity) as long as forest or fallow communal lands are available for clearing. The communities often fail to develop adequate controls on the use of communal resources because of population growth and rapid westernisation of traditional values.

It is possible that an efficient allocation of common resources requires certain specific conditions to facilitate collective action and that such conditions are not always present in most poor countries. In general, it appears that efficiency of the commons tends to be present in communities with low density of population where the transaction and monitoring costs are low (Baland and Platteau, 1996). The paradox is that it is precisely in case of high and rapid increasing population density that collective action is most needed to achieve an efficient use of common resources (Lopez, 1998).

Poorer countries with lower ratio of wages to rents, rely more on labour than on machines. The advanced techniques are more capital (human and physical) intensive, the capital scarcity determines the pace at which new techniques along with decisions on input demand are implemented. Speedy and effective efforts should be made for developing location specific production technologies and to carry them quickly to the farms. Availability of inputs at reasonable rates and the desired quantity should be assured. The focus of the agricultural policy should be the small and marginal farmers, therefore, radical changes are required in our subsidy policy and in the structure of subsidies as well as of other policies.

The north-east is encountered with a serious threat as to how to match fast growing labour force with employment. For this purpose new job opportunities in non-farm sector should be created. The non-farm activities of rural workforce are found to be casual in nature but yield larger income comparing what the traditional occupations would have done. It has been noticed that the industrialised and urbanised centres do have influence on the adjoining rural areas to diversify the occupational pattern of rural households. Iyyampillai and Jayakumar (1997) suggest that the degree of urbanisation and literacy rate appear to be the two major factors that influence the levels of non-farm employment. Most of the rural workforce engaged in non-farm activities belong to the category of less educated and traditionally skilled and

thereby are forced to work under poor working and wage conditions. Emphasis has to be laid on training in various non-farm activities to these persons for gainful employment.

The jhumias support their family income and supplement consumption from livestock, a grove of bamboo, coconut, arecanut, backyard fishpond, traditional loom, handicraft skill and the cropping pattern on jhum land, which represents a complex mix of inter-crops including paddy, maize, beans, tapioca, ginger, chillies and a range of vegetables. All these constituents make a viable asset base for a self-reliant and sustainable economy. The approach to develop the hilly areas should be to build up this asset base rather than distributing inputs and doling out assistance which are rarely used and adopted properly. This however calls for adoption of radically different methods and approaches to development involving active participation of the people at all stages of decision making.

Industrial Setting

As on March 1994, the region had 166 large and medium scale industries. Out of these industries, more than 70 percent were in Assam. Some of them have been declared sick. Practically speaking there is hardly any large or medium private industry outside Assam. Gross output per employee as well as fixed capital per employee is less in the region compare to all India average. This indicates either low fixed capital or over-employment. Net value added is high in states having oil, and gas or mining industries like Assam, Meghalaya and Tripura. But it is negative in Manipur (Sachdeva, 1998 : 32).

Sachdeva has further noted that the major contribution of value of output by manufacturing industries in the region are in food sector, wood and wood products, nonmetallic mineral products, rubber plastic and petroleum and in paper products. In Assam and Tripura about half of the units are in the food sector. In Nagaland 71 percent of them are in wood products. In Meghalaya 64 percent are based on mineral products. Outside these four or five areas, there is hardly any industry. Overall, the region contributes little over 1 percent to the value of output of manufacturing factory sector of India (Sachdeva: 1998:34).

It must be understood that private capital is a critical component for industrial progress in the region. Higher levels of private investments are essential to generate productive employment, to raise productivity and improve work culture. Despite announcements and appointing many

commissions, the centre is less likely (or less able) to increase public expenditure to remove infrastructural bottlenecks, Therefore, the bulk of capital that will be required to improve supply responses in the region will ultimately have to come from private rather than government sources. Under the given circumstances attracting private capital should be given highest priority compared to what has been so far. At least as much effort should be devoted to this task as is devoted to securing aid from the centre.

Nearly three-fourth of territorial spread of the region covers hill terrain intersected with innumerable streams and rivers. For this reason development of transport and communication network are seriously handicapped. Under this situation, industrialization programme need to be structurally decentralised by setting up of small scale and household industries based on locally available resources using labour intensive technology producing goods and service for meeting local and regional demand. It is the small industries and household industries which should occupy the core position in rural development programmes.

Rural Industrialization and People's Participation

It has boon asserted since long that for balanced development of the country suitable industries have to be developed in rural areas which would help gradually in upgrading the simple production techniques used by village artisans, weavers, blacksmiths and a host of other functionaries. Rural industrialisation would transform a stagnant rural economy into dynamic industrialised economy. Besides it would develop local entrepreneurship. For example, the establishment of agro-processing units on co-operative basis in Maharashtra is encouraging agriculturists to become entrepreneurs too.

Rural industrialisation (Jain, 1974) has to be differentiated from the approaches followed so far. It involves full participation of the local factors and agents in the establishment of industries. The villages will be the growth centres, and agriculture will be the kingpin on the base. The mode of rural industrialisation depend upon the nature of industrial activity, access to resources and availability of marketing opportunities to individual enterprise as well as the level of skill and enterprise. When production is to be carried on a large scale or the nature of processing is such that large scale production could be viable and which is justified as well from the point of view of productivity and growth, large units in the cooperative sector should be encouraged. If production can be

carried out conveniently on a small scale basis in family households, individuals may be encouraged to set up such units fitted with modified technology.

Any judgement on new technology should be arrived at by looking interrelated aspects of costs, scale and employment. Research in evolving suitable technology supported with training facilities to use the technology must receive a high priority. The rural industrial units facing no competition from urban organised industries should be promoted by strengthening the marketing arrangement, easy credit supply, and adequate supply of inputs at reasonable prices. The emergence of new industries also depends on network of science and technology, availability of basic infrastructure like power, communication and transport (Agarwal,1993).

We should link the agro-industries with the needs of rural people and produce the major part of their forward and backward linkages within the village economy. The backward linkages in the farm and allied activities are most effectively produced by agro-industries, but the surplus that these activities produce gets mostly appropriated outside the area because their product have a demand which is mostly urban. On the other hand, industries producing inputs for agricultural and allied production would produce forward linkages but the material required for their output mostly comes from urban areas. Local skills and technology can very well be used in these industries, but the modernisation of agriculture itself leads to the change in the nature and quality of inputs required.

It has been noted that both in respect of articles of consumption as well as inputs used in agriculture, the relative price movements show a gain for the agriculturists in the post-reform period. Parikh *et al.*, (1995) while supporting the reforms in favour of the agricultural growth point out that measures for liberalisation of trade and industry already introduced are likely to have a beneficial impact on agriculture in the long run by turning the terms of trade in its favour, which may attract greater investment into this sector. However, it may be noted that a mere favourable price environment by itself may not be sufficient to evoke adequate supply response by attracting private investment unless public investment in infrastructure and human resource development is stepped up in the less developed areas for ensuring a broad-based and employment-oriented growth. Hanumantha Rao (1996) observed that the development policy has to be more inclusive, concerned not merely

with 'structural adjustment' with a view to simultaneously making friendly to the poor basically by strengthening their socio-economic position. In tribal belts and the hills of country where the impact of green revolution had not been noticed, the rural development strategy should comprise of extension of cultivable area under settled cultivation in place of shifting cultivation, shifting of jhumias in some other fruitful occupation under TRYSEM programme, creation of gainful employment opportunities by using available agricultural, horticultural and forest potential. It calls for vigorous approach for creating suitable industrial climate for exploiting such vast potential. Some of the industries emphasising on value added include livestock feed, processed food industry, rice mills, and rice husk-based units, soyabean - based edible, oil mills, production of starch and sago from tapioca roots, ginger-based oleoresin and ayurvedic drug units, rubber, tea, coffee plantation and their produce-based processing units, citronella oil-based industries producing numerous cosmetics, perfumery and pharmaceutical products of common use, fruit processing units based on abundantly grown horticultural products like pineapple, banana, apple, orange, guava and papaya, etc.

Cash crops successfully grown in the north-east region of the country needs attention including cashew, coconut, and saffron cultivation on commercial scale. Experimental plantation of black pepper, cinnamon and coffee have given promising results. The cultivation of these crops will contribute a lot in the economy of this region.

Animal husbandry is an age-old activity in the hills and tribal areas but there is hardly any industry based on dairy products and animal wastes like hides, skins, bones and other by products of slaughter houses. Other units include piggery with ancillary bacon processing, broiler and other poultry farms units for polishing and egg grading in main production centres and livestock feed units.

Conclusion

Rural industrialisation should form an integral part of the overall strategy of hill area development and should be accompanied by and well integrated with the development of agriculture. Finally any strategy for the development of hilly and tribal areas should cautiously take care of the traditional skills, crafts, occupation of the people, their needs, aspirations, constraints, limitations and inherent capabilities. In most cases, it may be more necessary to evolve appropriate technology

depending upon its local conditions than to transfer already existing technologies. Above all strenuous efforts towards generating awareness about the utilities and usefulness of the newly developed technologies need to be mobilised as a prerequisite for their introduction in the area. Training in relevant areas should be another priority item.

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2

RURAL DEVELOPMENT IN NORTH-EAST : An overview

Tarun Bikas Lahiri

M.S. Swaminathan, the celebrated agricultural scientist told in course of a speech on Rural Poor, 'Famines in India are not famines of food, but of work. There are 9 crore jobless in India right now with more than 70 lakh additional people entering into the job market every year. The industries can absorb barely 5 lakh of these new entrants leaving more than 65 lakh which yearly add to the enormous pool of unemployed'. Though the remark was made in 1981, there has been no significant change of situation. What Swaminathan underlined is absolutely true. Currently there are 60 million tones of surplus food grains languishing in FCI godowns (2002) yet a substantial percentage of rural poor cannot secure two full meals a day due to lack of purchasing power. This situation can only be reversed if sustainable employment could be created in rural areas. Increase of employment will come only through a change which requires prevention of natural degradation, rise in productivity, starting of new enterprises which demands proper planning and organization. In order to develop strategies for change, a quick look at the present state may be helpful.

As more than 70% (72.22 % in 2001) of India's population is rural, overwhelming proportion of people below poverty line live in villages of India. Such rural-urban difference is expected to be same in North-East states also. Because, except Mizoram, all the N-E states are much less urbanized than Indian average. So, by and large, due to dominance of rural habitat, N-E is poorer than other regions.

Percentage of population living below poverty line

	1987-88	*1989-90*
Rural	33.4	28.4
Urban	20.1	19.3
Total	29.9	25.8

Source : Indian Economy, Vol. 1, Sept 1991, CMIE, Mumbai.

OVERVIEW OF RURAL SITUATION

N-E Rural Population and its Distribution

By 2001 census, seven N-E states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura have a combined rural population of 32,523,012 persons. Assam, the most populous state in the region has highest percentage of rural population of N-E (71.5 %). Tripura, the second most populous state in N-E., is way behind Assam holding about 8% of N.E's rural population.

In the N-E region nearly 40,000 villages bear the load of 32.5 million people. Average population size of a village is less than 1000. Average village size is highest in Tripura (3093) and lowest in Arunachal Pradesh (238). Rural population distribution pattern provides direction for framing development strategies.

Table 1 shows rural population, number of villages and average size of the villages by states of the North-East as in 2001(however number of villages by states are of 1991).

N-E : Overall demographic features

Table 2 presents overall demographic features of N-E states, levels of literacy, urbanization etc. Total area of 7 N-E states is 255,028 sq. km, habitat of about 38.5 million persons in 2001 and support 3.74% of India's population. However, as the N-E. States are dominantly rural, so, out of India's total rural population of 741,660,293 in 2001. N-E states cover 8% of India's population. N-E states share of rural population is 4.38%. In all the N-E. states except Assam, density of population is less than national average. In case of urbanization, all N-E states except Mizoram are behind national average. Assam is most populous with least urbanization, Mizoram is the least populous with highest urbanisation. By literacy rate, N-E states are more or less same as that of

national average. But Mizoram outshines with nearly 91% male and 86% female literacy, followed by Tripura. However literacy rate has little impact on decadal (1991-2001) population growth rate which is higher than national rate except Triupura and Assam which showed a lower growth rate. Nagaland recorded the highest growth rate in 1991-2001, i.e., 64.41%.

Overall Levels of Development

Centre for Monitoring Indian Economy, on the basis of selected indicators, ascertained levels of development of all states and districts of India. As a whole all criteria taken together India is given the value of 100, rest of the states relate to national average of 100. Developed states exceeded 100 mark, less developed states falls below 100. The N-E. states show remarkable uniformity, values range between 54 and 55 only. Only Arunachal has a little higher value of 66, perhaps because of sparse population which gives it highest per capita food grains production in N-E.

Respective RDIs of states of N-E. together with their status related to development indicators are given in Table 3 which includes participation ratio and shows dominance of agricultural workers.

Land Use Characteristics

Latest available land use statistics of 1995-96 and 1998-99 are presented in Table 4. The difference between total cultivated area and total cultivable area indicate scope for further expansion of agriculture. Specially Assam, Meghalaya, Mizoram and Nagaland appear to have considerable scope, whereas in rest of the states in the N-E scope is marginal.

Rice is the principal crop in all the states except in the district of West Kameng of Arunachal where Maize takes the pride of place (Table 6). Maize is also an important crop in Arunachal as a whole also in Meghalaya, Mizoram and Nagaland. Tea commands considerable coverage in Cachar, Darrang, Dibrugarh and Sibsagar Districts of Assam.

Though Rice is the main crop, productivity is quite low specially in Arunachal and Assam. Manipur with 2290 kg/ha tops in rice productivity. However, all the N-E. States stand far behind when compared with Tamil Nadu 3443kg/ha, Punjab 3152 kg and A.P. 2781 kg (see Table 4)

Though it may not apply to Assam to that extent, the reason for low productivity may be related to widespread Jhum cultivation.

Jhum or shifting cultivation covers considerable larger area than settled cultivated land in Arunachal, Nagaland, Manipur, Mizoram and Meghalaya (Table 5).

Level of Agricultural Modernisation

Table 7 indicates per Ha consumption of fertilizers (N+P+K), percentage share of electricity consumption in agriculture vis-a-vis total electricity consumption, percentage of villages electrified and percentage of irrigated area of total crop area.

It appears that Manipur is outstanding with highest per Ha consumption of inorganic fertilizers and area coverage by irrigation. Surprisingly, Nagaland has the highest percentage of area under irrigation though its per Ha consumption of fertilizers (N+P+K) is very low in the region alongside Arunachal. As irrigated area has greater ability to digest fertilizers, perhaps it may be presumed that Nagaland uses more organic fertilizers.

However, by standard of per Ha consumption of fertilisers, N-E ranks lowest in India with an average of 29.16 kg per Ha. All India average is 87.45 kg, its North Zone 129.59 kg followed by South Zone with 113.66 kg.

Electric consumption for agriculture is lowest in N-E with average of 3.43% whereas southern region is at the top with 35.93%.

N-E : Land Use: Forests Coverage

N-E region holds the top position in the country for widespread forest coverage. Even in populous Assam, where density of population is higher than national average, forests cover 30.20% (1999) of its geographical area against All-India average of 19.39%. Mizoram, Nagaland and Arunachal have very high forests coverage. But in every state open forests cover larger area than Arunachal and Assam (See Table 8). The forests yield a large number of major and minor forest products including food.

In the N-E, bamboo which is grown very widely is an important raw material for pulp and paper industry. For instance, nearly 40% of geographical area of Mizoram is covered by bamboo. Projected demand of bamboo for pulp and paper is as given below:

Demand of Bamboos for Pulp and Paper

(000 tonnes)

	Bamboo Demand	
	1985	*2000*
High Estimate (Paper & Pulp)	3,123	3,546
Law Estimate (")	2352	1,936
Other Non-industrial uses	2,960	3,459

Source : Shah S.A.: *Forestry for People*, ICAR, New Delhi, 1996

Apart from industrial and other commercial uses, forests also provide food. Shimongs of Arunachal consume abundant supply of roots, fruits and leaves as well as meat of wild animals. Starvation is unknown to them. The diet of Abhors that is largely based on forest produce has been considered as superior to the average Indian diet.

But the forest wealth of N-E has been endangered due to large-scale clearance of forests for extensive Jhum cultivation which has different names in different localities such as *Jhum*, *Kumri*, *Podu*. This practice is mostly associated with tribals. Deforestation is robbing the country of its natural defense against environmental degradation and its impact is seen in accelerated soil erosion, silting of dams and rivers and change in micro climates besides loss of green gold.

It is seen from the Forest Survey by GOI that there had been a net loss of 633 sq. km. of forest area in N-E from 1991 to 1993. However, Jhuming is not the sole reason for deforestation in every state of N-E For example, in Assam, loss due to extensive lumbering is causing deforestation more than by Jhuming. However, thanks to afforestation programmes, there has been some gains in Nagaland and Tripura (See Table 9). But losses elsewhere is quite large, in Mizoram alone 437 sq. km. of forest was lost between 1994-98.

The vital need for protecting forests has been ably summarized by Gunner Paulsen : forests "are useful to man in two different ways: as producers of a wide variety of goods called 'forest produce and as custodian of favourable environmental conditions. Both are indisputably essential to the well being indeed for survival of man".

STRATEGY FOR RURAL DEVELOPMENT IN N-E

Response to Two All India Programmes

A general review has been made of certain socio-economic conditions, pattern of use of agriculture and allied resources as prevailing in the N-E Region. Inputs from it may help in framing strategy for bringing a change towards better living in rural areas of N-E

Before commenting upon possible areas of attention for rural change, it may be useful to look into the response of N-E States to all India Rural Development Programmes, viz., IRDP and JRY.

As it is known, IRDP is mainly family oriented and aims at assisting the families living below poverty line to cross the line in a way that is sustainable. JRY funds are mainly for landless wage-earners which are meant for public works though assistance for individual household is also a component of it.

It is surprising that in case of IRDP, percentage of achievement to target was much short of All- India figure except in case of Manipur and Tripura which stand much above than national average (see Table -10)

In contrast, JRY had been largely successful. Except Arunachal and Meghalaya, rest of the states showed higher percentage of utilisation than All India average (see Table 11).

Manipur and Tripura's achievement in IRDP is commendable. In JRY, Nagaland and Mizoram occupy first and second place. Position of Arunachal is weak both in IRDP and JRY. Performance of Arunachal and Meghalaya is much weaker in respect of JRY.

Does the relative success of JRY point to preference for wage earning than endeavouring for sustainable self sufficiency in the N-E

ENVIRONMENTAL OPPORTUNITIES : ITS UTILIZATION

Hydro Power

The alliance of terrain, climate (moderate to heavy rainfall) and torrents provide ample opportunity for harnessing hydro power. The scope is particularly noteworthy all along the flanks of the Brahmaputra Valley. Examples of such harnessing is found at Umtu Project near Guwahati and Barapani Dam on way to Shillong. Such opportunities exist elsewhere in N-E States. Examples: Ranganadi Project in Lower Subansiri District of Arunachal, Gumti Dam in Tripura etc. But these

developments also create environmental problems which will be discussed later.

Forest Wealth, The Task of Preservation : It has been seen that very valuable forest wealth of the N-E is being depleted. Ways are to be considered not only for arresting it but to find ways to have more trees in the region. Agro Forestry is one answer. Under it, fast growing native trees under different situations are identified and incorporated into the cropping system. It meets fuel and fodder needs of local community

Revival of Woodlots which are also known as 'sacred groves' will be useful. Under this system, part of the land used to be set aside for protection of biological communities as well as for regulated harvests. In Mizoram, specially in remote areas, this system still survives. However, for arrest of deforestation regulation of jhum or shifting cultivation is most vital. To point out the gravity of problem, extensive incidence of jhuming in Mizoram may be cited. It is estimated that as many as 50,000 families in Mizoram depend upon jhuming. As a result nearly 40,000 Ha of forests are being destroyed annually. Such extensive practice of shifting cultivation is also seen in Arunachal, Nagaland, Manipur and Meghalaya (See Table 5).

Lately, jhum cultivation has been increasingly damaging because previous favourable 20 year cycle, due to population pressure, has been reduced to 5 year cycle. This has affected yield from the farm besides causing environmental damage. Mizoram government has adopted a policy whereby cultivators are given incentives and financial assistance to pick up alternative profession giving up shifting cultivation.

In Nagaland, redevelopment of shifting cultivation is widely practiced now. Fast growing plant species like alder are grown in intervening 5 year cycle which give a good harvest. This system is in use by tribal farmers in the Angami, Chakesang, Yim, Chunger and Konyak areas.

Indian Council of Agricultural Research (ICAR) unit at Shillong recommended a model of 3 tier land use for hill regions which proposed that upper 1/3rd of slope be allotted for forestry, the middle part of the slope be used for plantation / horticultural crops and the lower 1/3rd for terraced cultivation. This system was not in conformity with social structure of tribal communities. So the proposal found little acceptance.

A good example of terraced cultivation on slopes with least soil erosion is found in the villages of Buddhist Monpas in the western part of Arunachal. Monpas are well organised, live in good houses. But Abhors and Tagins of Arunachal present a different picture of unskilled agricultural practices.

Raising Agricultural Productivity and Diversification

Much larger quantity of inorganic fertilizers are consumed by tea gardens in the N-E In cultivated areas, per Ha consumption of fertilizers is lowest in India (Table 7). Electricity consumption by agricultural sector is either nil or very low. Productivity of rice, main crop of this region, due to the factors noted is far behind other states (see Table -4). Crops other than rice command much lower coverage except in few districts (see Table 6).

So raising agricultural productivity, using cultivable fallow, crop diversification and introduction of some cash crops wherever possible should get priority in N-E as its population is overwhelmingly dependent on agriculture.

Pineapple as Cash Crop and Input to Fruit Preservation Industry

There could be various ways of crop diversification. Pineapples provides a good possibility. In 1992-93, by area and production, Assam ranked first, Karnataka stood second by production. Meghalaya, Manipur, Tripura and Nagaland have sizeable land coverage by pineapple. However, productivity is quite low in N-E Tamil Nadu produces 41.00 tonnes per Ha, Karnataka 34.90 tones /Ha, whereas Assam, the leading producer in N-E, produces only 13.30 tonnes /Ha (see Table -12) If proper care is taken, 53,000 to 59,000 plants are planted per ha, the cost benefit ratio could be quite attractive as 1: 4.2 found out by the Kerala Agricultural University. The main problem is marketing, weak accessibility of N-E. States is the greatest constraint. Fruits when need to be transported for long distances requiring several days, refrigerated transport is necessary to slow down ripening process.

Whereas 97% of world production of pineapple is used by canning industry, elsewhere, in India the proportion is less than 10%. Development of Canning Industry at nodal locations commanding pineapple growing cluster of villages seems to be a distinct potential for higher income and increment in rural employment.

An Idea about export market for Indian pineapple is given below:

Export of Fresh Pineapple from India: 1995-96

Country	*Quantity (tonnes)*
Nepal	102,335
Russia	76,000
All India	239,220 (Steadily increasing from 1993-94

Source : Pineapple: ICAR

India : Export of Pineapple Juice, 1995 - 96

Russia	302,376 (tonnes)
All India	320,736

Note : In previous year, Ukraine was the leading importer. For pineapple squash, Russia largest importer , followed by Ukraine. Germany was an important importer of processed Pineapple.

It appears that Nepal is a good market for fresh Indian pineapple. Till processing and canning industry remain undeveloped, N-E may target Nepal market for export of its fresh fruits.

Industry

In spite of its good natural resources like petroleum, gas and coal, N-E region is very undeveloped industrially. In all the states of N-E less than 5% of workers are engaged in manufacturing including household industries (1993). However, Tea Industry of N-E because of its export market is quite important.

Assam Tea Industry

At The 26th annual general meeting of the Assam Branch of the Indian Tea Association (Abita) in November 2001 at Jorhat, the picture presented was quite grim. Assam's tea gardens are located on high terraces of the plains/hill margins produce nearly half of India's output (400 m kg annually). Nearly 12-15% of Assam's population is dependent on tea. Tea industry's demand for plywood, coal and fertilizers promote production of these goods. The industry also provides casual and permanent employment to about 6 lakh workers. Though maximum employment is required in picking season. The demand for skilled labor throughout the year is rather limited. Migrant labour specially in picking season has the dominant role.

Crisis of the tea industry as viewed by ABITA CHAIRMAN Bharat Singh is related to

(a) Sluggish growth

(b) Higher cost of production

(c) Declining prices

(d) Deterioration of quality

The other factors contributing to the decline in quality related to government's issuing factory licenses to people without their own plantations. They secure leaves from various sources that have adversely affected quality. Further, small tea gardens, presently major players, rarely seek advice from Toklai Research Station. Technical advice from Toklai station could improve quality of Tea.

Due to these reasons, Abita chairman noted that hundreds of gardens are incurring losses because of slow down as huge stocks of tea remain unsold for long periods (*The Telegraph*, Dec 1, 2001, p. 8).

Cottage and Household Industry

Every state in the N-E has formulated industrial policies to provide incentives for small scale industries. The nature of incentives provided by each state is more or less same which include allotment of land, shed, helping manpower development, capital investment subsidy, transport subsidy, subsidies for technical know-how, subsidy of interest, on power lines, preparation of project report single window assistance and likewise. Such package is found in Arunachal Industrial policy, 1994, Assam's Policy of 1991, Manipur in 1990, Meghalaya in 1988, Mizoram 1989, and Tripura 1992.

However, in spite of such policies of the States, much headway has not yet been made as reflected in very low percentage of workers engaged by industries including household industries.

Assam has nearly 1/7th of India's handlooms. There is also good promise in the N-E for fostering cottage silk industry. Production of raw silk was sizeable in the states of Assam, Manipur, Meghalaya and Nagaland.

For promoting rural household industries, the experience of Sri Lanka may be noteworthy. Sri Lanka, a very small island country, is also predominantly rural, 78% of its population live in villages (1992),

but Sri Lanka's quality of life is better than India. In Human Development Index (UNDP report) Sri Lanka ranks 90 against India's position of 135. One reason is widespread rural household industrial employment. Large international companies, using cheap Lanka labour particularly women, get garments prepared as per the designs given by those companies. Supply of raw materials and marketing responsibility of those good are taken care of by controlling companies. If such network for utilizing skills of N-E states could be organised, then household industries may expand manifold. Commendable artistic skills exist in these states:

Sates	*Production* (tonnes)
Assam	534
Manipur	217
Meghalaya	196
Nagaland	23

Note : Karnataka was the highest producer with 8327 tonnes followed by A.P. with 2447 tonnes

Source: Indian Agriculture in Brief, 2000

Some other Areas of Promise

Fruit preservation and canning industry has possibilities in view of sizeable quantity of fruit productions like pineapple, oranges etc.

N-E States have marvellous natural beauty with mountains, forests, lakes and valleys which could attract a large number of tourists. But very few tourists visit the region for lack of accessibility, insecurity, want of basic facilities and amenities. Attitudinal change of local people towards visitors would promote tourism. Presently the bulk of visitors from all over the country come to Kamakshya in Guwahati as pilgrims. Kaziranga games sanctuary, Shillong with its natural beauty, Manipur with its rich cultural heritage and such other places could draw lot more visitors if suitable programmes backed by facilities for movement and stay could be organised. This would boost the economy of the region and could be a source of employment.

Checking of Environmental Degradation: Should be of Primary Concern

Floods occur every year in one part or other of the great Brahmaputra Valley which is about 650 km long and 100 km wide. Nalbari subregion is worst affected. It is surprising that in spite of tremendous technological progress, no effective flood control programme could yet be drawn and implemented.

Control of Soil Erosion

The problem of soil erosion related to deforestation, cultivation of slopes without adequate care has been dealt earlier. Now few other facets of environmental degradation may by considered. The Loktak lake of Manipur, biggest in eastern India is facing continuous decay. The Keibul Lamajo National Park, country's only floating sanctuary, located in this lake is in danger. Fishes of the lake used to support thousands of villagers living on all sides of the lake. However, unchecked denudation leading to soil creep in the lake is causing rapid decay. All rivers of Manipur discharge in this lake. If effective afforestation is not taken up, together with dredging, survival of the lake will continue to be threatened. Moreover, 150 MW power project drawing water from the lake through tunnel without recycling has led to loss of water and affecting life of the lake.

The Gumti Dam of Tripura, because of the lack of proper advance planning, has led to environmental degradation. It was built to generate 10 MW of Hydel Power.

For construction of this Dam, some 46 sq. km of land with rich rice fields and forests have been lost. Nearly 5000 tribal families have been uprooted. Bulk of those displaced migrated to upper catchment areas of the Gumti and practicing jhum cultivation which led to environmental degradation. So, proper prior planning is essential.

Deforestation is the greatest threat to environment in the N-E Region. Its effect is seen in two ways, decreasing rainfall specially in upper Assam and increasing incidence of floods.

There has been several efforts for replacing jhum by terrace cultivation. Subsidies and inputs used to be given as incentives. It worked so long as subsidies continue but farmers revert back to jhum when subsidies are withdrawn.

Conclusion

Prospects and problems of rural development in N-E have been discussed in brief. Those are to be considered location specific. In the tribal areas of the N-E ecological conditions change drastically over short distances. So development strategies are to be adopted accordingly. In other words, micro-level planning should be the approach.

Cultural heterogeneity of the N-E should be given due consideration. There are about 55 tribes living in N-E The major groups are divided into subgroups. Studies in sociology of kinship throw light on tribal organizations and their behavioural pattern. While the cooperative spirit is the tribal way of life, he is also conscious about independence of family as unit. For emotional participation of the people these factors should be given due consideration in the process of developmental planning.

This implies that development planning for tribal and other rural groups should be in tune with the value system that people can understand, appreciate and identify themselves with it.

Rural development or any form of development is bound to suffer if unrest and violence continue to disintegrate the society. For the N-E, specially for hill states, dearth of central assistance prima facie does not seem to be a great limitation. For example, in Mizoram, 5th plan had an outlay of Rs. 46.56 crores, 6th plan Rs. 130 crores, 7th Plan (1985-90) 260 crores. Certainly more assistance will bring more reconstruction specially because development in this region was initially slow. But in the present socio-economic conditions of the country, limitation of resources going to remain a constraint for long time to come. Therefore, best utilization of available resources are to be ensured. A uniform plan for whole of the North-East will not be practical, micro level plans meeting area wise needs are to be prepared. However, this mosaic should have interlinks as development is not possible in isolation.

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Table 1 : Rural Population, Number of Village and Average Village Size, 2001

States	*Rural Population (1991)*	*No. of Village Size*	*Average*
Arunachal Pradesh	8,68,429 (2.67)	3,649	238
Assam	2,32,48,994 (71.50)	25,590	909
Manipur	18,18,224 (5.59)	2,212	822
Meghalaya	18,53,457 (5.69)	5,629	329
Mizoram	4,50,018 (1.38)	785	573
Nagaland	16,35,816 (5.02)	1225	1335
Tripura	26,48,074 (8.15)	856	3094
Total :	3,25,23,012 (100.00)	39,946	814

Source: Census of India, 2001
Note: Figures within bracket indicate states percentage share of Total Rural of N. E. Region. India's Total Rural Population in 2001 is 74,16,60,293. N. E. States' share: 4.38%

Table 2 : Population Distribution, Decadal Percentage Growth, Sex-Ratio, Population Density, Literacy Rate, Urban Percentage in NE States, 2001

State/India	Persons 2001	%tage decadal growth rate		No. of females per '000 males		Population density per sq km		Literacy rate 2001		State's share of population amomg NE state total 2001	Urban population %tage to total population
		1981-91	1991-01	1991	2201	1991	2001	Male	Female		
INDIA	**1027015247**	**23.86**	**21.34**	**927**	**933**	**267**	**324**	**75.85**	**54.16**		
1. Arunachal Pradesh	10,91,117	36.83	26.21	859	901	10	13	64.07	44.24	2.83	20.41 (12.80)
2. Assam	2,66,38,407	24.24	18.85	923	932	286	340	71.93	56.03	69.22	12.72 (11.10)
3. Manipur	23,88,634	29.29	30.02	958	978	82	107	77.87	59.70	6.20	23.88 (27.52)
4. Meghalaya	23,06,069	32.86	29.94	955	975	79	103	66.14	60.41	5.99	19.63 (18.60)
5. Mizoram	8,91,058	39.70	29.18	921	938	33	42	90.69	86.13	2.31	49.50 (46.10)
6. Nagaland	19,88,636	56.08	64.41	886	909	73	120	71.77	61.92	5.16	17.74 (17.21)
7. Tripura	31,91,168	34.30	15.74	945	950	263	304	81.47	65.41	8.29	17.02 (15.30)

Total Popu. 3,84,95.089
of N.E. States, 2001

Note: Total population of N. E. States account for 3.74% of India's total in 2001 overall Popu. Density is 150.94 persons sq.krn. against India's 324 in 2001.

Figures within brackets show 1991 percentage

Total Area of 7 N. E. States : 2,55,028 sq. km. = about 8% of India's area sq. km.

Total Popu. in 1991 was : 3,13,86,911 = nearly 4% of India's Population

Average density o f Popu. in NE was 123 per sq. km. in 1991 against India's 267

Source: Census of India, 1991 & 2001.

TABLE 3: Relative Development Index of N.E.

(Figure within bracket indicate All-India average)

	Relative Dev. Index	*Population Growth Rate Per Year*	*Urbanisation %*	*Literacy %*	*Female Literacy %*	*Workers as % of Total Population*	*Agri & allied workers as % of main workers*	*Per capital Foodgrains Production Kgs.*	*Road Length Per 100 sq. km.*	*Per Capital Bank Credit Rs.*
1. Arunachal Pradesh	66 (100)	3.11 (2.14)	12.80 (25.73)	41.59 (52.21)	29.69 (39.29)	46.24 (37.46)	67.26 (66.92)	210 (173)	8.51 (60.14)	320 (1978)
2. Assam	54 (100)	2.13 (2.14)	11.10 (25.73)	52.89 (52.21)	43.03 (39.29)	36.09 (37.46)	73.50 (66.92	119 (173)	81.98 (60.14)	581 (1978)
3. Manipur	55 (100)	2.54 (2.14)	27.52 (25.73)	59.89 (52.21)	47.60 (39.29)	42.18 (37.46)	69.97 (66.92)	151 (173)	29.43 (60.14)	483 (1978)
4. Meghalaya	54 (100)	2.80 (2.14)	18.60 (25.73)	49.10 (52.21)	44.85 (39.29)	42.67 37.46	(74.21) (66.92)	75 (173)	28.59 (60.14)	435 (1978)
5. Mizoram	54 (100)	3.35 (2.14)	46.10 (25.73)	82.27 (52.21)	78.60 (39.29)	48.91 (37.46)	65.77 (66.92)	82 (173)	15.50 (60.14)	343 (1978)
6. Nagaland	55 (100)	4.60 (2.14)	17.21 (25.73)	61.65 (52.21)	54.75 (39.29)	42.68 (37.46)	75.20 (66.92)	93 (173)	47.59 (60.14)	807 (1978)
7. Tripura	55 (100)	2.95 (2.14)	15.30 (25.73)	60.44 (52.21)	49.65 (39.29)	31.14 (37.46)	63.79 (66.92)	156 (173)	106.47 (60.14)	714 (1978)

Source: Profile of District, November 1993, Published by Centre for Monitoring Indian Economy, Bombay.

Table 4 : Land use Characteristics, Average Farm Size, Principal Crop & yield rate in NE States

State	*Reporting for land use (1995-96) (000 Ha)*	*Forest (1995-96) (000 Ha)*	*Total Cultivated Area (1995-96) (000 Ha)*	*Total Cultivable Area (1995-96) (000 Ha)*	*Percentage share of Rice to Total Cropped Area (1995-96)*	*Average size of operations Holdings (1990-91) (Ha)*	*Yield of Rice Kg/Ha 1998-99*
1 Arunachal Pradesh	5495	5154	213	293	48.6	3.72	988
2. Assam	7850	2012	2854.	3229	63.6	1.27 .	1345
3. Manipur	2211	602	140	164	84.6	1.23	2290
4. Meghalaya	2241	937	272	1074	42.1	1.77	1420
5. Mizoram	2088	1598	109	445	59.6	1.38	1649
6. Nagaland	1546	863	325	626	61.4	6.82	1445
7. Tripura	1049	606	281	310	54.2	0.97	1939
All India	299875	68479	156024	183626	23.0	1.55	1928

Note : (a) Maize is an important crop in Arunachal (13.5%), Meghalaya (6.9%) Mizoram (7.3%), Nagaland (12.3%)
(b) Highest yield of Rice (Kg. per Ha) is found in Tamil Nadu 3443 Kg., Punjab 3152 Kg. & A.P. 2781 Kg.

Source : Indian Agriculture in Brief, 2000, Agriculture Statistics Division, Ministry of Agriculture, Govt. of India.

TABLE 5 : Land use Pattern in N.E. States 1990 (Satellite based data)

State	*Agricultural Land % of total area*			*Plantation (%)*	*Forest (%)*	*Wasteland (%)*
	Kharif	*Rabi*	*Double Cropped*			
1. Arunachal Pradesh	a. 4.55% b. 2.46%	–	–	–	82.81	–
2. Assam	37.61%	22.22%	18.93%	12.34%	21.90	13.50
3. Nagaland	a. 28.58% b. 2.35%	–	–	–	68.09	–
4. Manipur	a. 25.91% b. 7.58%	–	–	–	63.33	–
5. Mizoram	a. 4.06% b. 3.26%	–	–	–	92.81	–
6. Meghalaya	a. 32.56%	–	–	–	63.80	–
7. Tripura	a. 4.81% b. 14.76%	–	– 4.84%	–	36.90	–

Note : (a) Under Shifting cultivation
(b) Under settled agriculture

Source : National Remote Sensing Agency, Hyderabad

Table 6 : Some Important Crop-Coverage in N.E.States (Other than Rice), 1993

States	*District*	*Crop*	*Area as Percentage of District Total*
Arunachal Pradesh	Changlang	Maize	9.23
	Dibang Valley	Maize	29.66
	East Kameng	Maize	14.84
	East Siang	Maize	20.43
	Lohit	Maize	33.27
	Lower Subansiri	Maize	17.28
	Tawang	Potato	32.50
	Do	Wheat	31.98
	Tirap	Maize	30.88
	Upper Subansiri	Maize	15.22
	West Kameng	Maize	58.47
	West Siang	Maize	15.11
Assam	Cachar	Tea	18.48
	Darrang	Tea	14.13
	Dibrugarh	Tea	25.84
	Sibsagar	Tea	34.75
Meghalaya	East Garo Hills	Ginger	13.32
	East Khasi Hills	Potato	32.10
	Jaintia Hills	Maize	20.72
	West Khasi Hills	Potato	33.03

Note : Table reflects where crop coverage exceeds nearly 10% of cultivated area. However, Rapeseed command such share in several districts of Assam.

Source : Centre for Monitoring Indian Economy, Bombay, November 1993.

Table 7 : Modernisation Status Of Agricultural Activities : Certain Indicators

States	*Per Ha Consumption of Fertilisers (kg) (N+P+K)*		*Percentage Share of Electricity Consumption in agriculture vis-a-vis Total Consumption 1995-96*	*Percentage of village Electrified as on 31-3-98*	*Percentage of irrigated area of Total crop area 1995-96*
	1996-97	*1997-98*			
Assam	14.59	21.93	2.46	77.0	15
Manipur	48.64	49.68	0.53	88.9	27.7
Meghalaya	14.43	15.00	0.57	45.5	18.9
Nagaland	3.89	4.28	-	94.8	31.6
Tripura	18.80	29.28	16.00 (1994-95)	93.9	13.1
Arunachal Pradesh	2.16	2.19	-	59.2	14.7
Mizoram	3.37	10.18	-	98.0	8.3

Note: (a) Tea Board of N.E. consume substantial Quantity of Fertilisers which was 32014 in 1996-97 and 42780 tonnes in 1997-98.
(b) By per Ha consumption of Fertiliser in 1997-98, North Zone with 129.59 kg. tops the list followed by South Zone 113.66 and West Zone 60.15. N.E. Zone ranks lowest with average of 29.16 kg. All India average is 87.45 kg.
(c)In 1995-96 percentage share of electricity consumption by agri sector is highest in Southern Region (35.93), followed by Western Region (33.57), Northern Region (32.30), Eastern Region (9.93), N.E. India ranks lowest with 3.43, All India average is 30.95.
(d) All India average of villages electrification in 1998 was 85.45

Source: Indian Agriculture in Brief, 2000.

Table 8 : Extent of Dense Forest, Open Forest, Mangrove

States	*Dense Forest Sq. Km.*	*Open Forest Sq.Km.*	*Mangrove*	*Total Forest Cover Sq.Km.*	*Percentage of Geographical Area*
Arunachal Pradesh	57,756	11,091	0	68,847	82.21
Assam	14,517	9171	0	23,688	30.20
Manipur	5,936	11,448	0	17,384	77.86
Meghalaya	5,925	9,708	0	15,633	69.70
Mizoram	3,786	14,552	0	18,338	86.99
Nagaland	5,137	9,027	0	14,164	85.43
Tripura	2,228	3,517	0	5,745	54.79

Source : Forest Survey of India, Ministry of Environment and Forest: State of Forest Report, 1999

Table 9 : N.E. States : Change in Forest Area from 1991 to 1993 (Sq.Km.)

State	*Loss Due to Jhuming*	*Other Reason*	*Total Loss*	*Gain Due to Afforestation*	*Net Loss /Gain*
Arunachal Pradesh	70	28	98	-	-98
Assam	165	190	355	112	-243.
Manipur	28	36	64	-	-64
Meghalaya	110	2	112	6	-106
Mizoram	256	-	256	100	-156
Nagaland	63	-	63	90	+27
Tripura	10	27	37	40	+3
Total	702	281	983	348	-633

Source : Forest Survey, Ministry of Environment & Forest, GOI, Dehradun 1993

Table 10: IRDP : Physical Progress for 1990-91 and 1991-92

State	Percentage of Achievement to Target*	
	1990-91	1991-92
Arunachal Pradesh	27.11	12.83
Assam	74.09	40.40
Manipur	358.79	212.21
Meghalaya	59.87	47.43
Mizoram	54.14	15.80
Nagaland	63.04	37.78
Tripura	249.73	36.12
All India	122.56	66.58

* Upto December 1991

Source: NIRD : Rural Development Statistics, 1992

Table 11 : JRY: Percentage of Fund Utilisation, 1990-91

State	*Percentage of Utilization*
Arunachal Pradesh	42.15
Assam	85.54
Manipur	88.95
Meghalaya	39.13
Mizoram	99.17
Nagaland	100.00
Tripura	86.20
All India	78.41

Source: NIRD : Rural Development Statistics 1992

Table 12 : Pineapple Area and Production, 1992-93

State	*Area (Ha)*	*Production (Tonnes)*	*Productivity (Tonnes/Ha)*
Assam	13,906	184,485	13.30
Manipur	6,450	60,500	9.38
Meghalaya	8,450	72,500	8.58
Mizoram	810	4,189	5.17
Nagaland	1,017	2,415	2.37
Tripura	3,706	32,000	8.63
India's Total	59,436	858,978	14.45

Note : By Area & Total Production, Assam ranked First, Karnataka stood second by production. By Productivity Tamil Nadu is first 41.00, Karnataka is second with 34.90 tonnes/Ha

Source: Chadha, Reddy & Sikhamany : Pineapple, ICAR, Directorate of Information and publication of Agriculture, New Delhi, Jan 1998

Table 13 : Rural Households, Primary Sources of Energy 1987-88

Per Thousand

State	*PRIMARY SOURCES OF ENERGY FOR LIGHTING*		
	Kerosine	*Electricity*	*Others*
Arunachal Pradesh	373	390	217
Assam	923	70	7
Manipur	678	297	25
Meghalaya	755	239	6
Mizoram	777	208	15
Nagaland	NA	NA	NA
Tripura	799	214	7
All India	746	238	16

Source : Sarvekshana, 52nd Issue, July-Sept 1992, NSSO

Table 14 : Electrification of Tribal Villages, 1989-90

State	*No. Tribal Villages*	*No. of Tribal Villages Electrified as on 31-3-90*
Arunachal Pradesh	3257	1354
Assam	6496	4339
Manipur	1384	683
Meghalaya	4902	2170
Mizoram	721	402
Nagaland	1112	1099
Tripura	2655	1130
All India	111,886	69,877

Source : Central Electricity Authority