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9.1: Summary of Findings

Population is an important factor in determining the level and growth of an economy. On the one hand it determines the supply of labour force whose quality of course depends on the achievement in education, health care, technical know-how etc. Also, rising population and labour force can help in growth of output and income only if there is no dearth of resources to gainfully employ and the production units are on a suboptimal level. But if the economy fails to employ the rising work force and there is limitation of resources or human being fails to raise new resource through research and development then the growth of economy will be limited to the carrying capacity and unemployment will increase. In that case market will also fail resolve the problem. If the consumption pattern and technology remain unchanged then rising population create more demand for food, shelter, educational facilities, health care facilities, housing facilities and thus more drain on natural resources like that of land, water, mineral, forest, etc. Along with that, if per capita consumption also rises over time, it expedites the process of degradation of natural resources.

In Meghalaya we observe substantial growth of population during last few decades, which is associated with high degree of inter-district variation in growth rate. Since 1971, the growth rate of population in the state has always been higher than the national average growth rate. The highest growth rate in the state has been recorded during the period of 1981-91 (32.86 per cent). The annual exponential growth rate has been above 2 per cent since 1971. Among the North Eastern states the growth has
been lower than Nagaland, Mizoram and Arunachal Pradesh but higher than the other North Eastern states. The density also has been enormously increased from merely 45 persons per square kilometre in 1971 to 103 persons per square kilometre in 2001. But still now the density is much lower than the national average. There is high degree of inter-district disparity in density and growth of population. It is the highest in East Khasi Hills and followed by West Khasi Hills due to more facilities and urbanisation. The sex ratio also has been found to be higher than the sex ratio of the country as a whole since 1971. The proportion of female in the children age group has also increased over time, leading to an increase in over all sex ratio. This is in conformity with the matrilineal society in Meghalaya (mentioned in chapter-4). Also percentage of people in the working age group has increased over time. But there has been no significant development in industrial sector. Hence there has been a rise in pressure on primary and tertiary sector. Also work participation rate for that group has declined due to lack of rise in opportunities.

The literacy rate has been rising but still remains much lower than that of the national average. This is perhaps due to the non-availability of educational facilities to most of the people in the state especially those who are settled in the rural areas (more than 80 per cent). Still now most of the people are cultivators and agricultural labourer. Among the cultivators especially in rural areas, percentage of female has increased over time and also in urban other informal activities percentage of female is very high. Because of lack of industrial progress according to the need of rising population and work force, dependence on primary and tertiary sector has increased. Though there has been shift of workforce from primary to tertiary sector in percentage term during last few decades, due to rise in population and thereby demand for food, fodder, timber etc pressure on agriculture increased manifold. But productivity of
agriculture has not increased at the desired rate and thus per capita production of food grain declined over time. The result is more expansion of agriculture to even hilly slopes at the cost of forest land (net sown area has been increased) and that also raises intensity of soil erosion. So there has been an increase in pressure on natural resources, especially mineral and forest. As minerals are mostly under private ownership (and hence not accessible to many common people) and there is open access to forest in many cases, stress on forest has increased steadily. These changes thus have been associated with rising extraction of forest resources and thereby adversely affecting the productivity of forest and also the economy of those, who depend more on forest; leading to an increase in the incidence of poverty, which furthered the degradation of forests in the state of Meghalaya.

The state has been suffering from large scale poverty especially in the rural areas. Though over time poverty has been declining, the rate of decline is much slower than the national level reduction. Also we find great divergence in rural and urban reduction in incidence of poverty. During the last three decades, reduction in poverty in urban area has taken place at a rapid rate even more than the national level whereas rural poverty has not declined significantly, which is also associated with high inter-district variation. Thus in spite of several direct poverty alleviation and employment generation programmes initiated in India and particularly in the state of Meghalaya, the state has not been able to reduce poverty, unemployment or underemployment significantly as compared to other states of India, which is clear from the over time lowering of all India ranking in human poverty as well as human development. Still now about one-third of the population in the state is living below the poverty line. Though poverty has been reduced substantially in the urban areas
compared to all India average; reduction in rural poverty has been very slow; which indicates the concentration of development programmes in the urban centres.

Rapid population growth has eaten up the fruits of the expected benefit and also the corruption in the bureaucracy to siphon off allocated money at the top level disallowed it to tickle down to the actual beneficiaries and hence reduced the overall economic progress and development of the state. Moreover, the amount of allocation is also not sufficient as the cost of any project is much more in Meghalaya than in the plain areas. Also because of poor infrastructure and lack of monitoring, many of these programmes have not reached in time to the villagers and works have been mostly concentrated in town and its nearby areas. Moreover, due to lack of information and ignorance the rural poorer cannot create pressure (political and social) on the authorities and loose the access to such benefits. The banking system and financial institutions are also increasingly becoming less interested to advance through various poverty alleviation and employment generation programmes due to poor recovery experienced earlier.

Also rapid growth of population has increased the pressure on land. Expansion of agriculture, cattle population, infrastructure demand, etc. has resulted to the loss of areas under forest cover in the state. Soil erosion and degradation of forests was intensified further. Therefore, incentives for long term management of natural resources, especially forest is still absent in Meghalaya, as people are still highly dependent on it. The degraded forest resources in turn, affecting the labour productivity of the poor and thus the productivity of the natural resources, including forest on which they act upon. Thus in Meghalaya we find a closely linked and self-perpetuating negative spiral in which poverty accelerates environmental degradation and degradation results in further poverty.
The degradation of forest cover in the entire North-Eastern Region during the period of 1990s was at an alarming rate and that was highly associated with the inter-state variation (explained in chapter-6). The degradation has been more in the open and unclassified forest areas. In Meghalaya the rate of degradation of forest was the highest in the district of East Khasi Hills, followed by West Khasi Hills and Jaintia Hills districts. Here the degradation is primarily because of the rapid growth of population coupled with the high incidence of poverty especially in rural areas. The results show how the per capita forest cover changed over time and it is found that the state having higher rate of population growth observed larger reduction in per capita forest cover and vice versa. In spite of low population density in the region, the forest cover in North East India has shown consistently decreasing trend during 1991 to 2001, whereas even in comparatively more densely populated states like West Bengal and Haryana, forest cover has increased during 1990s because of awareness among the people and also of successful campaign. Moreover, the economic activities are mostly based on the forest resources as there are very limited other industrial activities in the region. Though due to Supreme Court ban (1997) on the felling of trees some of saw mills have been closed, still illegal felling has been continued in the state of Meghalaya for the survival of the poor people and the continued logging business activities that are carried out by the richer section of the people and also supported by the corrupted bureaucrats. Recently, the local authorities are also allowing extraction of forest on a limited scale in order to tackle the problem of rising unemployment and sustenance of the people and hence many of the closed sawmills have started operating again. The forest based small-scale industries in the state of Meghalaya has also increased from 131 in 1986-87 to 943 in 2004-05. The raw materials demanded or supplied to these industries resulted to the loss of forest
resources in the state. However, at the same time it provides job and employment opportunities to the rural poor.

At the same time, rising population has increased the requirement of land for cultivation in the state of Meghalaya for meeting the rising needs of the growing people. Thus the area under cultivation has increased from 30 thousand hectares in 1976-77 to 193 thousand hectares in 1985-86 and then further to 207 thousand hectares in 1997-98. This increase has been largely at the cost of forest area. Per capita forest area in Meghalaya was 0.84 hectare in early 1970s, which decreased significantly to 0.53 hectare in early nineties and then further to 0.41 in 1999 i.e., it reduced by more than 50 percent during three decades. The percentage of main workers engaged in forestry, logging, fishing, plantation, orchards etc. increased from 2.66 in 1971 to 6.39 in 1991. Also the number of livestock population including cattle, buffaloes, pigs, goats, sheep, horses and ponies has increased manifold as shown in chapter-7. Therefore, there was a sharp increase in pressure on pasture land by over 104 per cent during 1972 to 2003.

Thus, in Meghalaya, the forest resources have been threatened due to overgrazing, household and commercial uses, illegal encroachment, unsustainable practices like unscientific cultivation (shifting cultivation) and growing demand for development activities. Excessive fuel-wood collection, indiscriminate felling of trees for timber needs, inadequate natural regeneration has also threatened the rich biological diversity of the state. The ownership pattern and the system of management have also been partly responsible for the degradation of forests in Meghalaya. Many of the forests in the state are owned by the private individuals. But due to poor maintenance most of those forests in the state have also been destroyed. At the same time, forest policy also is not implemented properly, leading to the misuse of these
resources by the people. Although JFM have been implemented in some states of North East, particularly in Tripura, Arunachal Pradesh, Assam, Mizoram and Nagaland, its implementation in the region has been very slow. The states of Manipur and Meghalaya are yet to make any mark on this aspect.

Finally, on consideration of the level of economic development and complex social and political linkages, the state of Meghalaya is faced with immense and consequential environmental problems. Its prevention has become more of its necessity and a compulsion than a mere initiative. From the rising number and percentage of main workers engaged in forestry and allied activities, rising forest based industries and employment thereof as well as rising quantity of triennia total outturn of forest produce, it is clear that forest has always played an important role in the socio-economic life of the people in Meghalaya. However, over time with the growth of the economy along with growing population and persistence poverty, percentage contribution of forest to the economy has declined, which has been largely due to the large scale decline in quality and productivity of forest (even harvesting of larger area does not yield proportionate increase in output; also per capita forest has declined as has been identified in chapter-6) and also partly due to rising availability of other alternative opportunities. Also the contribution to the economy has been associated with the wide inter-district variation, due to differences in the pattern of degradation and availability of forest resources.

It is very difficult to have an idea about the total contribution of forest to the state’s income and employment and also the implication of forest to the majority of people especially the poorer, which are highly dependent on forest product for their livelihood, as many of these poor people are attached to the forest life and derive their daily sustenance. Therefore, analysis of consumption and livelihood pattern of those
people with various categories of income (that better explain the dependence of those people on the forest and forest based products) was undertaken with help of household level primarily collected data to explain the linkage.

The regression results also indicate that there is very insignificant impact of education on the collection of fuel-wood or percentage of income earned from forest. Actually there is high degree variation in educational level and a very few are educated in the sample villages. Moreover the villagers are poor and hence human development level is also low. The incidence of poverty and lack of other opportunity push them towards forest resource and more so if it is common. Both fuel-wood collection and earning from forest, is significantly positively related to family size and negatively related to total family income. It is also observed that better job opportunity is negatively related to dependence of people on forest. Larger family size also means more requirements and thus it intensifies harvesting of forest. The results show that the low educated, relatively poor village has relatively larger family size and hence dependence on forest is more. Collection of fuel-wood or other consumption items is positively associated with the family size, which is significant. Actually a smaller family can also extract more if they do it for commercial purposes or if their per capita consumption of such items is higher. The negative coefficient of family income in the regression analysis indicates that the affluent people will be less dependent on forest. However, it does not mean that they do not use forest resources. What it indicates is that the richer devote less time for harvesting forest due to the high opportunity cost of their time or because of social position. Rather they collect fuel-wood, charcoal and other items from the other people as in the interior villages where LPG and other fuel are not available. Also they find some locally collected items cheaper than at town and hence many of the items available in the nearby forest
also find place in their daily menu though the percentage is less for the rich. By this the rich people in the interior village also can save a part of their income due to availability of cheap forest resource.

From the sample villages we find inverse relation between income and extraction of forest resource. Also, we observed average income of the people who extract forest resources in the poorest village is more than who do not. Actually in the village (Mawlangkhar), which is far away from town/business centre, forest and agriculture together constitutes the main occupation due to lack of other opportunities. Hence those who collect more they earn more. Moreover, a very few households own land and forest and hence they harvest commercially though on a limited scale and their income is much more than the others in that village. The distance from town or main commercial also has significantly positive impact on collection of fuel-wood and contribution of forest to family income. Though there is limited commercial activity, it is one of their main earning sources.

Forest is the source of a part of income and survival of those people living around it. So pattern of cooking fuel, cattle rearing and other consumption habits and thus quality of life is also partly shaped by the availability of forest resources. Also a few people earn substantial income from timber collection and that is expedited if there is better access and timber industry.

It is observed that the correlation between district-wise population growth and per capita Net District Domestic Product during 1993 to 2000 was -0.46 but correlation with literacy rate is insignificant. Though rising educational level is expected to raise the capacity to earn more and reduce demand for more children, just mere variation in literacy is not enough and more so if there is high degree of poverty. The poorer is expected to prefer more children, who can extend hands in their family
works and provide insurance to their parents at the old age. Poverty level in the state has not been reduced significantly relative to other states of India.

Though improvement in education is expected to raise scope of income and help better understanding of resource management, if people suffer from chronic poverty, little improvement in education cannot provide much scope for reduction in pressure on forest. However, people may try to better manage forest resource for their survival. But that is not possible unless those people have the property and thus resource security.

9.2: Conclusion and Policy Implication

Rapid growth of population is the cause as well as consequence of poverty and environmental degradation. This has been observed in the state of Meghalaya especially in rural areas with the help of primary data. The linkages between population, poverty and environment, especially forest resources are also associated with many other critical issues including scattered and poor development, inequality in income and resource ownership, property right problem, technological barrier and government policies. The downward spiral of poverty and environmental degradation is a waste of opportunities and of resources. In particular, it is not merely the size of population, but also the consumption pattern, that determines the nature of extraction and degradation of forest. In case of management also, it is the quality of population i.e., human resource; whose deficiency is prominent in Meghalaya and leading to mismanagement of forest resources. Lack of educational facilities such as formal and informal education, training to raise awareness, information dissemination, communication, are vital to combat environmental degradation and to eradicate the problem of poverty. Policy intervention and respond strategies to reduce poverty
through sustainable management of ecosystems and ecosystem services should be developed in a proper way and also to explore and promote innovative actions to eradicate poverty and to regenerate the resources. The challenge is to identify measures at national and local levels, especially in the state of Meghalaya so that it will help the communities build better institution and partnerships with the poor people. Also the awareness among the people in rural as well as in urban areas of the state may help reducing population growth, incidence of poverty as well the environmental degradation or the degradation of forests and thus achieving the sustainability of development of the state economy.

The wasteful and destructive production and consumption pattern of certain sections (richer section) of the people needs to be regulated. The production of agriculture and other goods for export which affects internal food supply for the subsistence of poor people also need to be taken care. Therefore, collective, private and public institutions and government policies play a vital role in determining how rapid growth of population, poverty and the degradation of forests affect the environment.

The critical problem of the state is the cycle of population growth, the vicious circle of poverty and resources degradation. In addition to human degradation, this cycle degrades and threatens to exhaust the renewable resources on which the local people depend. Thus, development and environmental goals are inextricably linked; development that alleviates poverty is essential, if renewable resources, especially the common property resources and sustainable livelihoods for a large section of the population are to be preserved. But if it is not designed in a proper way, it will affect the developmental goals of the economy of the state.

Persistent poverty continues to hinder the implementation of population
controlling measures and accelerate the process of degradation of forests, land and soil. Environmental degradation, in turn, lessens the labour productivity of the poor and the productivity of the natural resources they manage. The population policy thus should not be confined to family planning only because they are affected by other factors also. The best agreement for family planning and environmental protection is that both are critical to sustainable development and thus should go hand in glove along with the external efforts to remove poverty, improve human quality and productivity of resources.

Rapid growth of population and simultaneous rise in aspiration levels have added substantially to rising pressure on the environment and to reduce the major impact on the forest, other facilities such as easy availability of cooking gas and alternative to forest based, building materials may be provided to the growing population especially to poorer at subsidised rate so as to reduce the stress on the environment. Reduced poverty contributes to a healthy civil society, democracy and greater social stability. Although the poor people being too weak are not a source of rebellion but gross inequalities lead to social conflict and disturbances. Thus to eradicate the poverty it is essential to increase human development, increase productivity, reduce human re-productivity; lower the family size that finally would reduce the stress on the environment. We have seen that growth of population; poverty, etc. have an adverse impact on the development of the economy and population and poverty move in the same direction and so also the impact on the environment or forest and hence the breaking of vicious linkage is essential to accelerate the pace of development.

However, the right enjoyed by the people especially the poorer should be fully protected as they are highly dependent on it. Their domestic requirements of
fuelwood, fodder, minor forest produce and construction timber should be the first charge on forest produce. However, it is essential to incorporate such dependence in the policy formulation and take account of environmental and forest resource changes in the measurement of development aspect. This requires a major shift in the thinking, a careful policy formulation and designing of an appropriate framework to safeguard the natural resources especially common forest resources for promoting sustainable development of the economy of the state.

Finally, we can say that the best way to preserve forest and improve the condition of the people in the state is to improve the economic condition and development of the economy through education, technological development and suitable cultivation approach and also to follow a judicious land use pattern so as to maintain the forest resource and its productivity. This will provide sustainable sustenance to the poor people and also improve their condition and standard of living. Moreover, education would help in controlling family size and thus population and raise the efficiency and productivity of the people and also lead to better management of forest resource that would avail them sustainable development and benefit. Still now, there is no record of land holding by the people of Meghalaya, which is also important to know the level of inequality of land distribution among the families, especially in rural areas. This is because, land especially forest land is the main source of revenue of many families and therefore unless land is measured and recorded it is very difficult to ensure protection of ownership or taking care of it in the policy formulation.