Chapter 7

Implication of Changing Forest for the Economy of Meghalaya 132-143

7.1: Introduction
7.2: Spatio-Temporal Changes in Contribution of Forest to the Economy of Meghalaya
7.3: Observation
7.4: Conclusion
7.1: Introduction

Unlike mineral resources which are non-renewable, forest resources can always be renewed, provided that man has directed his energy and skill in the right direction. Forests provide essential and indispensable needs of the rural population in the form of small timber, fuel, fodder, grazing, and a variety of minor forest produce such as grass, fencing material, bark, fibre, edible flowers and roots, gum and honey, etc. In rural areas, forests even supply food and shelter to the people, especially to the poorer as well as animal population. Moreover, forests yield a variety of produce of commercial and industrial importance such as timber for buildings, pit props and supports for mining, raw material for forest-based industries like pulp and paper, plywood and boards, rayon, matches, shellac, medicinal plants, and essential oils (Chauhan and Chuahan, 1998, pp. 53-54).

Actually the dependence or linkage between forest and human being is not unidirectional. It is a both-way dynamic relationship. If people depend much on forest and continuously extract it without leaving much time for the regeneration or do not take proper care for the re-growth, after a certain time the forest is bound to degrade. Again, if the forest is degraded, its capability to supply materials for human consumption declines and hence the economy of the people affected. On the other hand, if the population size and its requirements (depends on the pattern of
consumption and availability of cheaper substitutes) are less compared to the initial
capacity of the forest, quality of the forest and biodiversity become richer and richer
and thereby can continuously meet the demand of the people. Thus taking queue from
the inverted-U hypothesis it can be stated that the degradation first rises with the initial
phase of development of the economy and after the economy reaches a particular level
of development degradation declines with further development (Grossman and
Krueger, 1995). Historically we observe, even with a small population, the aspiration of
the people to become rich at quickest possible time and development of the civil society
led to large scale deforestation till the time they realised and learned how to manage the
resource in a scientific way for the sake of their own welfare.

7.2: Spatio-Temporal Changes in Contribution of forest to the Economy of
Meghalaya

The economy of Meghalaya as already mentioned is basically rural based. Most
of the activities are agro and forest based. As expansion of agriculture and other
activities have been affecting forest, its impact on the economy also has been changing
over time. By importance we mean the contribution of forest to income, employment,
which can be direct or indirect. Here basically the direct impact is explained through
the changes in peoples’ dependence on forest or people engaged in forest or related
activities, income earned from the forestry and logging activities and the quantity and
value of major materials earned from the forest. However, forest has many other
contributions as noted earlier, in the form of facilitating soil and water conservation and
hence maintaining the productive value of soil; bio-diversity, temperature and
maintaining environmental balance and finally to the tourism of a region. Similarly,
forest has indirect impact on those activities, which are dependent on the primary forest
produces but are difficult to estimate. Value of preventing soil erosion can also be done
through the comparison of long term loss in output of a degraded area due to
deforestation with the productivity of an area having good forest cover, which is
beyond the scope of our study. Secondary information regarding all those matters is
not available. Hence the variation in direct contribution to employment, income and
major aggregate outputs over time is considered in the present section.

7.3: Observation

From the Census Reports we observe that the percentage of main workers in
Meghalaya engaged in livestock, forestry, hunting, plantation and orchards were 2.66 in
1971, which sharply increased to 6.53 per cent in 1981 and then remain at around 6.4
per cent in 1991. Number of forest based small scale units in Meghalaya were only 131
in 1986-87 (Directorate of Economics and Statistics, Government of Meghalaya) and in
2004-05 it increased to 943 including the workshops of wooden furniture, cane and
bamboo works etc (Directorate of Economics and Statistics, government of
Meghalaya). Total number person employed in such units were about 1010 in 1986-87
and increased to 5125 in 2004-05. But because of paucity of data, inter-district
comparison is not possible.

In order to know the importance of forestry in the economy of Meghalaya, the
percentage of Net Domestic Product (NDP) comes from forest resources and its related
activities is considered. Since it is very difficult to calculate multiplier effect of
extraction from forest resources on allied activities, we just considered the value of
direct utilisation of such resources, as available from secondary sources (Department of
Forest, Government of Meghalaya).

Data on population, NSDP, value of major output of the forest and its
contribution to NSDP of Meghalaya are available for the period 1980-81 to 2004-05.
From those, the exponential growth rate of each of them is estimated by using semi-log linear trend and compared. The result yields:

1. \(\ln \text{Population} = 7.17 + .0264 t^* ; R^2 = 0.996 \) 
   \((78.23)\)

2. \(\ln \text{NSDP} = 11.04 + .0572 t^* ; R^2 = 0.987 \) 
   \((41.54)\)

3. \(\ln \text{Per Capita NSDP} = 8.475 + .0308 t^* ; R^2 = 0.943 \) 
   \((19.44)\)

4. \(\ln \text{Output of Forest} = 6.696 + .0509 t^* ; R^2 = 0.7651 \) 
   \((8.655)\)

5. \(\ln \text{Percentage Contribution of Forest to NSDP} = .26 - .006 t ; R^2 = 0.042 \) 
   \((-1.006)\)

Note: Figures in the parentheses represent t-values and coefficients of t are growth rates. * indicates that the value is significant.

The equations show that the exponential growths of NSDP, population, output of forest all are significant during 1980-81 to 2004-05. But the growth rate forest output and NSDP are almost same and standard errors of the coefficients are different. Therefore, we observe insignificant trend of percentage contribution of forest to NSDP.

Chart-7.1

![Chart-7.1](image-url)
Chart-7.1 shows the over time changes in contribution of forest resources to Net State Domestic Product of Meghalaya since 1980-81. A sudden increase in contribution during 1995-1997 is observed, which may be because of the fear of losing own forest by the people after the imposition of Supreme Court ruling on felling of trees (the process of which was going on at that time) and thus the people disheartened and the incentive to preserve and improve forest resource was lost. Therefore rampant exploitation took place at that time before it stabilised in 1998-99 and again started increasing gradually through illicit harvesting in many cases. However, for this whole period, district level data are not available and hence inter-district comparison is not possible. Only during 1993-94 to 1999-2000 district-wise data are available, the explanation of which is followed now.

Approximately, 1.48 per cent of Net State Domestic Product was contributed by forestry and logging activities in 1993-94 and it increased to 2.02 per cent in 1996-97, after which it declined to 1.82 per cent in 1999-2000. Because of ban during these periods the forest-based activities have not increased in the same way as happened in case of Net State Domestic Product. Also the productivity of forest has declined. The district-wise pattern of percentage contribution of Forestry and logging to Net Domestic Product is presented in table-7.1.

Table-7.1
Contribution of Forestry and Logging to Net District Domestic Product and NSDP in Meghalaya during 1993-94 to 1999-2000 (in Percentage)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaintia Hills</td>
<td>1.69</td>
<td>2.18</td>
<td>2.19</td>
<td>1.95</td>
<td>1.61</td>
<td>1.25</td>
<td>1.16</td>
</tr>
<tr>
<td>East Khasi Hills</td>
<td>0.55</td>
<td>0.56</td>
<td>0.55</td>
<td>0.48</td>
<td>0.39</td>
<td>0.35</td>
<td>0.31</td>
</tr>
<tr>
<td>West Khasi Hills</td>
<td>3.48</td>
<td>4.52</td>
<td>4.39</td>
<td>3.88</td>
<td>3.24</td>
<td>2.86</td>
<td>2.68</td>
</tr>
<tr>
<td>East Garo Hills</td>
<td>2.42</td>
<td>3.22</td>
<td>3.08</td>
<td>2.73</td>
<td>2.25</td>
<td>2.01</td>
<td>1.68</td>
</tr>
<tr>
<td>West Garo Hills</td>
<td>1.41</td>
<td>1.87</td>
<td>1.80</td>
<td>1.60</td>
<td>1.28</td>
<td>1.17</td>
<td>1.02</td>
</tr>
<tr>
<td>Ri Bhoi</td>
<td>2.03</td>
<td>2.82</td>
<td>2.62</td>
<td>2.28</td>
<td>1.99</td>
<td>1.87</td>
<td>1.52</td>
</tr>
<tr>
<td>South Garo Hills</td>
<td>3.25</td>
<td>3.90</td>
<td>3.79</td>
<td>3.39</td>
<td>2.93</td>
<td>2.40</td>
<td>2.00</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>1.48</td>
<td>2.05</td>
<td>2.17</td>
<td>2.02</td>
<td>1.78</td>
<td>1.67</td>
<td>1.82</td>
</tr>
</tbody>
</table>

The table shows that the contribution Net District Domestic Product in 1993-94 was the lowest in East Khasi Hills (0.55 per cent) and highest in West Khasi Hills (3.48 per cent). In 1999-2000, the contribution was ranging from 0.31 per cent in East Khasi Hills to 2.68 per cent in West Khasi Hills. Therefore, there has been significant decline in contribution of forestry and logging to Net Domestic Product. The chart-7.2 represents the over time changes in percentage contribution of forestry and logging to Net Domestic Product at the district as well as state level.

**Chart-7.2**

*District-wise Percentage Contribution of Forestry and Logging to Net Domestic Product in Meghalaya since 1993-94*

It is observed that the percentage contribution always been highest in West Khasi Hills and lowest in East Khasi Hills in 1990s. Actually, East Khasi Hills recorded highest population growth and therefore highest density because of its vicinity to the mainland through Guwahati and better communication and other facilities. Therefore, the forest of this district has been accessed (used for domestic and commercial purposes) since much before the other districts and much of forest has been already extracted and degraded by the inhabitants as well as transported to the nearby states.
Also, because of relatively better off district, per capita District Domestic Product is higher in East Khasi Hills is higher than any other district and much of it comes from the available alternative opportunities and hence relatively lower contribution of forest, which also declined but at a relatively slower rate. On the other hand the other districts are remote and there communications are poor, there is lack of alternative opportunities, per capita District Domestic Product has been much lower and many of the forests were not commercially used from earlier years. Therefore, contribution of forest has been relatively higher and though it has been declining the rate is comparatively lower.

Table-7.2

Exponential Rate of Growth in Contribution of Forestry and Logging to Net District Domestic Product during 1993 to 2000

<table>
<thead>
<tr>
<th>State</th>
<th>Growth Rate</th>
<th>Standard Error of Y Estimate</th>
<th>Value of t-statistic</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaintia Hills</td>
<td>-0.091</td>
<td>0.1759</td>
<td>-2.74</td>
<td>0.60</td>
</tr>
<tr>
<td>East Khasi Hills</td>
<td>-0.1073</td>
<td>0.0798</td>
<td>-7.113</td>
<td>0.91</td>
</tr>
<tr>
<td>West Khasi Hills</td>
<td>-0.072</td>
<td>0.1428</td>
<td>-2.65</td>
<td>0.584</td>
</tr>
<tr>
<td>East Garo Hills</td>
<td>-0.084</td>
<td>0.1610</td>
<td>-2.76</td>
<td>0.604</td>
</tr>
<tr>
<td>West Garo Hills</td>
<td>-0.0804</td>
<td>0.157</td>
<td>-2.71</td>
<td>0.595</td>
</tr>
<tr>
<td>Ri Bhoi</td>
<td>-0.0702</td>
<td>0.1588</td>
<td>-2.34</td>
<td>0.522</td>
</tr>
<tr>
<td>South Garo Hills</td>
<td>-0.096</td>
<td>0.1427</td>
<td>-3.56</td>
<td>0.717</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>0.000437</td>
<td>0.1453</td>
<td>0.0159</td>
<td>5.06E-05</td>
</tr>
</tbody>
</table>

Source: Directorate of Economics & Statistics, government of Meghalaya.

The annual exponential rate of decline is estimated by semi-logarithmic equation and presented in table-7.2. The table shows that there is significantly negative trend in contribution of forestry to each District Domestic Product during 1993 to 2000. The rate of decline is significant for all the districts except Ri Bhoi at 5 per cent level of significance. The decline is the highest in East Khasi Hills, followed by South Garo Hills and Jaintia Hills districts. Where as exponential rate of decline is the lowest in Ri Bhoi district. In Jaintia and South Garo Hills, the decline and degradation of forest resource is also due to large scale open cast mining of coal. However, very little
exponential trend of contribution is observed for the state as a whole because of its
dwindling feature during this small period of time.

District-wise variation in absolute net output from forestry and logging in
Meghalaya is presented in table-7.3. Though, in terms of percentage, contribution of
forest in every district declined, in absolute figure the earning from forestry and logging
in the state has increased from Rs. 1931 lakhs to 3157 lakhs during 1993-94 to 1996-
1997. The value then declined to Rs. 3051 in 1999-2000. There is a wide variation in
extraction of forest resources across the districts of Meghalaya. In 1993-94 the range
was from Rs. 173 lakhs in Ri Bhoi to Rs. 427 lakhs in West Khasi Hills. In 1999-2000,
the figure was Rs. 271 lakhs in Ri Bhoi and Rs. 677 lakhs for West Khasi Hills, i.e.,
range of inter-district variation increased significantly.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaithia Hills</td>
<td>313</td>
<td>449</td>
<td>531</td>
<td>515</td>
<td>480</td>
<td>500</td>
<td>497</td>
</tr>
<tr>
<td>East Khasi Hills</td>
<td>318</td>
<td>310</td>
<td>363</td>
<td>352</td>
<td>331</td>
<td>345</td>
<td>341</td>
</tr>
<tr>
<td>West Khasi Hills</td>
<td>427</td>
<td>615</td>
<td>728</td>
<td>692</td>
<td>650</td>
<td>677</td>
<td>677</td>
</tr>
<tr>
<td>East Garo Hills</td>
<td>253</td>
<td>362</td>
<td>429</td>
<td>416</td>
<td>389</td>
<td>405</td>
<td>399</td>
</tr>
<tr>
<td>West Garo Hills</td>
<td>341</td>
<td>489</td>
<td>579</td>
<td>560</td>
<td>522</td>
<td>455</td>
<td>542</td>
</tr>
<tr>
<td>Ri Bhoi</td>
<td>173</td>
<td>248</td>
<td>293</td>
<td>284</td>
<td>270</td>
<td>279</td>
<td>271</td>
</tr>
<tr>
<td>South Garo Hills</td>
<td>206</td>
<td>295</td>
<td>350</td>
<td>338</td>
<td>316</td>
<td>330</td>
<td>324</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>1931</td>
<td>2768</td>
<td>3273</td>
<td>3157</td>
<td>2958</td>
<td>3080</td>
<td>3051</td>
</tr>
</tbody>
</table>

The triennia total outturn of major forest products since 1979-82 to 1997-2000
is displayed in table-7.4. The outturn of industrial wood and fuel-wood in Meghalaya
was 47.029 and 1284.7 thousand metric tonnes respectively during 1979-80 to 1981-82,
which increased to 155.141 and 3475.7 thousand metric tonnes respectively during
1997-98 to 1999-2000. In case of bamboo, the outturn during 1979-82 was 184
thousand numbers and rose to 5682 thousand numbers during 1997-2000. The outturn
of broomstick was only 194 thousand metric tonnes during 1979-82 that increased to 10189 thousand metric tonnes during 1997-2000.

Table-7.4

<table>
<thead>
<tr>
<th>Year</th>
<th>Industrial Wood ('000 m$^3$)</th>
<th>Fuel wood ('000 MT)</th>
<th>Bamboo (No. Thousand)</th>
<th>Broomstick (MT)</th>
<th>Tezpatta (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979-80 to 1981-82</td>
<td>47.029</td>
<td>1284.7</td>
<td>182</td>
<td>194</td>
<td>--</td>
</tr>
<tr>
<td>1988-89 to 1990-91</td>
<td>11.576</td>
<td>2453.9</td>
<td>1200</td>
<td>1521</td>
<td>--</td>
</tr>
<tr>
<td>1997-98 to 1999-00</td>
<td>155.141</td>
<td>3475.7</td>
<td>5682</td>
<td>10189</td>
<td>3426</td>
</tr>
</tbody>
</table>


Thus there are significant quantum jumps of harvesting of industrial wood, fuel-wood, bamboo, broom stick and also of grazing field as seen earlier due to heavy rise in number of cattle and other livestock.

Agriculture is the main occupation of the people of Meghalaya and a large section of rural farmers practice jhum/shifting cultivation by clearing and burning the forest. Once they leave a particular place and migrate to other area for the same, regrowth of forest in the left degraded patch takes place. But if many people follow the same and the number of people in this category increases, the fallow period declines (the area gets less time to regenerate), as happened in North-East India, particularly in Meghalaya and cause degradation of soil and its productivity. Here fallow period has declined significantly from 25-30 years to 2-3 years and thus the resilience of the ecosystem also being increasingly broken down (Singh and Singh, 1992, P. 294; Singh et al, 1986, P. 48). From table-7.5 it is observed that percentage of maximum families practising jhum in 2001 was in South Garo Hills (44.13 per cent), which is followed by East and West Garo Hills (30.25 and 18.93 per cent). In East Khasi Hills only 0.57 per cent of families follow shifting cultivation. In the state of Meghalaya as a whole, 12.28 per cent of families have been practising the age old jhum cultivation. Whereas percentage of forest area under shifting cultivation is observed in West Garo Hills
(around 14.6 per cent) and followed by South Garo Hills (around 7 per cent). Therefore, along with mining, shifting cultivation also contributed to the degradation of forest in South and West Garo Hills. In the East Khasi Hills, because of relatively better advancement in education, urban contact as well as growing population and less availability of forest; adoption of modern technology is comparatively more and many people already practiseing settled cultivation and commercially to earn more.

Table-7.5

<table>
<thead>
<tr>
<th>State/District</th>
<th>% of Rural Population Practice Jhum</th>
<th>Total Family Jhum</th>
<th>Area under Jhum (Sq. Km)</th>
<th>% of Forest Area under Jhum</th>
<th>% of Families practice Jhum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaflunia Hills</td>
<td>2.52</td>
<td>1366</td>
<td>11.74</td>
<td>1.290535</td>
<td>2.74</td>
</tr>
<tr>
<td>East Khasi Hills</td>
<td>0.94</td>
<td>721</td>
<td>6.20</td>
<td>1.898347</td>
<td>0.57</td>
</tr>
<tr>
<td>West Khasi Hills</td>
<td>10.31</td>
<td>5374</td>
<td>46.19</td>
<td>2.26506</td>
<td>10.74</td>
</tr>
<tr>
<td>East Garo Hills</td>
<td>32.20</td>
<td>13630</td>
<td>117.15</td>
<td>4.94333</td>
<td>30.25</td>
</tr>
<tr>
<td>West Garo Hills</td>
<td>19.77</td>
<td>18086</td>
<td>115.45</td>
<td>14.59619</td>
<td>18.93</td>
</tr>
<tr>
<td>Ri Bhoi</td>
<td>12.11</td>
<td>4351</td>
<td>27.40</td>
<td>3.320447</td>
<td>12.48</td>
</tr>
<tr>
<td>South Garo Hills</td>
<td>43.66</td>
<td>7900</td>
<td>67.87</td>
<td>6.84132</td>
<td>44.13</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>13.87</td>
<td>51428</td>
<td>442.00</td>
<td>5.355232</td>
<td>12.28</td>
</tr>
</tbody>
</table>

Source: Ministry of Environment and Forest, Government of India.

However, one thing is clear from the data that the presence of forest that is either owned by community or Government, due to customary right most of the poor farmers follow subsistence shifting cultivation. Without forest it would not be possible for them to cultivate in that way as most of them are unable to purchase modern inputs due to lack of resource or availability in the remote areas. The correlation between the inter-district variation in area under jhum cultivation and number of families is 0.9723 is almost perfect correlation. Also the linear regression result shows significant positive impact of growing population on the expansion of area under jhum i.e., rising stress on forest over time.

\[
\text{Area under Jhum} = 4.71 + 0.007 \text{Population}^*; \quad R^2 = 0.9454
\]

Figure in the bracket represents t-value, which is highly significant.
7.4: Conclusion

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 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) and also partly due to rising availability of other alternative opportunities. 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.

Though we have a rough idea about the contribution of forest to the state's income and employment, from that information it is very difficult to have an idea of implication of forest to the majority of people especially the poorer, who are highly dependent on forest product for their livelihood. Many of these poor people are attached to the forest life, derive their daily sustenance and there are hardly any data on that aspect. Therefore, it is worthwhile to have an analysis of consumption and livelihood pattern of those people with various categories of incomes to know the nature of dependence of those people on the forest and forest based products. The inter-linkage has been better explained at the micro level through the collection of primary data as explained in the next chapter.
References:


