Characterization of Dwellers as a Major Agent of Deforestation in a Reserved Forest in Bangladesh

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Abstract

This paper analyses human groups and their socio-economic attributes and activities in a reserved forest area in the west coast of Teknaf Peninsula based on data generated by a household survey in the village of South Shilkhali, Baharchhara Union, Teknaf Upazila, Cox's Bazar District in Bangladesh. Although the reserved forest is legally closed for private activities except for certain people who have special entitlements to live in the area, about one-half of dwellers are “illegal” encroachers. Compared with people outside the reserved forest, while legal Bengali dwellers inside the reserved forest earn a comparable level of income, the income of encroachers and minority ethnic groups is significantly lower. Many of encroachers moved in the closed area relatively recently and their influx does not seem to tapering off. Because their main means of subsistence is involved in farming that requires clearing existing forests, increase in encroachers appears to be a major threat to forest regeneration of this area.

Key words: Deforestation, Encroachers, Socio-economic attributes.

I. INTRODUCTION

Deforestation in the tropics has been accelerated in the last few decades. An estimate suggests that during the 30 years between 1960 and 1990, 450 million hectare, approximately 20% of all tropical forests, disappeared [1]. Asia has been particularly affected in this respect. During the same 30 year period, 30% of Asian forests were cleared and the significant portions of the remaining forests have also been degraded due to human activities. As a result, it seems to be only one-third of the original forests that remain to be relatively “untouched” [1].

Diverse explanations of deforestation have been offered and are still being debated. Geist and Lambin analysed 152 local-scale case studies of deforestation in various parts of the world and suggested that there are no overarching patterns of the link between particular causes and deforestation [2, 3]. Rather, cases of deforestation are determined by “different combinations of various proximal causes and underlying driving forces in varying geographical and historical contexts” (p. 149), [2].

Gibson and others also emphasize the importance of the role of people at the local level [4]. They argue that national governments in developing countries often lack enough resources to enforce their laws to preserve forests. Compared to this ineptness of national governments, “local communities live with forests, are primary users of forest products, and create [their own] rules that significantly affect forest condition” (p. 3) [4]. With this realization it becomes important to understand who are those “local people” likely affecting forests in more specific terms.
because these local people play a key role in preserving/destroying forests. Therefore, the objective of this paper is to characterize "local people" in terms of their socio-economic attributes and activities around an area of deforestation in Bangladesh. The implication of the characteristics of local people in deforestation in that area is also discussed.

![Figure 1. Teknaf Peninsula, Teknaf Wildlife Sanctuary (TWS), and the location of South Shilkhali.](image)

II. MATERIALS AND METHODS

A. Study Area

The study area for this study is a village called South Shilkhali, and its settlements are located in and near Teknaf Wildlife Sanctuary (TWS), a reserved forest in south-eastern Bangladesh [5-7]. Reserved forests in Bangladesh were first established based on the Forest Act 1927 [8]. The area of the reserved forest is institutionally closed for human activities. Teknaf Wildlife Sanctuary, formerly called Teknaf Game Reserve, comprises 11,610 ha and was initially established in 1983 over an existing reserved forest in the middle of the peninsula [9, 10].

In spite of the presence of the reserved forest, the southern half of Teknaf Peninsula of Bangladesh has been suffering from long-term deforestation. Most large trees had been cut by large scale illegal logging up to the 1980s. Such logging is not currently going on partly because Bangladesh Forest Department (FD) conducts tighter surveillance and also because there are not many mature trees to cut any more. Deforestation affects human lives in this area. Serious outcomes of deforestation include water shortage, soil erosion, shortage of fuel wood and building materials, intrusion of wild elephants into human settlements and the depletion of nutrients for marine resources in the coastal area. Despite of various efforts, forests in this area have not been coming back. Environmental studies of this area claim that all kinds of human activities affect the conditions on the hills [10-12].

B. Data Sets

South Shilkhali consists of several small settlements locally called para (hereafter, the term “para” used, instead of “settlement”). Of these paras in the village, Nayapara, South Chakma para, and Math para, are located entirely inside the boundaries of TWS’s reserved area (Fig. 2). The first data set for this study includes household information from these three paras inside TWS. A total of 172 households were recorded by a survey conducted in September 2012. Among them, there is one household of Hindu religion which is excluded from the following analysis making the number of households in the data set being 171.

![Figure 2. Distribution of paras in South Shilkhali and the area of TWS. Dots represent houses in the surveyed area. Because villages and paras in this area are groups of houses, rather than the extent of space with definite boundaries, the borders of paras are indicated by dotted lines.](image)
2013 to record 85 households. All the 85 households consist of Bengali Muslims.

For these two data sets, no sampling was performed to select particular households in a para, but rather all available households in surveyed paras were recorded. Items recorded in these surveys are listed in Table 1.

Table 1. List of recorded categories in the survey.

<table>
<thead>
<tr>
<th>Household Attributes</th>
<th>Location, Religion, Ethnicity, Habitation history, Legal status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributes of Household Members</td>
<td>Age, Sex, Education, Birth place</td>
</tr>
<tr>
<td>Household Economy</td>
<td>Farming, Betel leaf (<em>paan</em>) farming, Other income generating activities</td>
</tr>
</tbody>
</table>

C. Unit of Analysis

This study uses five groups categorized by the location of residence (inside and outside the reserved forest), ethnicity, and the legal status of dwellers inside the reserved forest as the unit of analysis. These groups are: 1) Chakma, 2) Bengali legal dwellers (B-Legal), 3) Bengali encroachers (B-Enc), 4) Rohingya refugees (Rohingya), and 5) Bengali living outside the reserved area (B-Outside). Among these groups, Chakma and legal Bengali are entitled to live in the reserved forest; and Bengali encroachers and Rohingya refugees are not legal residents (Table 2).

The Chakma is an indigenous ethnic group, belonging to Tibeto-Burman and practicing Buddhism. While the center of their territory is located in the Chittagong Hill Tract, their distribution extends the surrounding areas including Teknaf Peninsula [13]. The Rohingya is a group of Muslim residing in Myanmar. But, a large number of people have become refugees fleeing to Bangladesh in the last few decades because of oppression [14, 15].

Table 2. Unit of analysis: groups of dwellers inside and outside TWS reserved forest.

<table>
<thead>
<tr>
<th>Location</th>
<th>Legal Status</th>
<th>Ethnicity</th>
<th>H Hs</th>
<th>Abbrev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside TWS</td>
<td>Legal</td>
<td>Chakma</td>
<td>26</td>
<td>Chakma</td>
</tr>
<tr>
<td></td>
<td>Bengali</td>
<td>60</td>
<td>B-Legal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Illegal</td>
<td>Rohingya</td>
<td>6</td>
<td>Rohingya</td>
</tr>
<tr>
<td></td>
<td>Bengali</td>
<td>79</td>
<td>B-Enc</td>
<td></td>
</tr>
<tr>
<td>Outside TWS</td>
<td>Bengali</td>
<td>85</td>
<td>B-Outside</td>
<td></td>
</tr>
</tbody>
</table>

Among these criteria, the legal status of dwellers requires some elaboration. Although the reserved forest is basically closed for private activities, there are kinds of people who legally live in the reserved forest. One kind is “forest villagers”: they are registered by the FD and are allowed to live in the area in exchange for their duties of forest management [5, 16]. The FD allocates a forest villager’s family a 2-acre lot, in which they live. The status of a forest villager can be inherited, but by only one descendent of the villager. While, in a strict sense, those who do not inherit the status have no right to live in the reserve forest after their father dies, these non-heir descendents tend to live where they are grown up. This study includes this kind of forest villagers’ descendents in the category of “forest villagers” as well.

Another kind of legal residents in the reserved forest are those families who started living in reserved forests before the Forest Act was enacted in 1927. If a family started to live in a currently reserved area before 1927, such a family and its descendents should be beyond the jurisdiction of the current act as the Article 5 of Chapter II of the Act specified it as an exemption [8]. This study, therefore, treats families who claim that they live in this area for an indefinitely long time or for more than 100 years as legal although there is no documentation for their claims in hand.

The third kind is indigenous people. This general area is Chakma’s traditional territory as stated above. This study therefore includes all Chakma as legal residents in the reserved forest regardless of the status of forest villagers and the length of habitation.

III. RESULTS

A. Household Income

Income of each household was recorded separately by using six categories. Those categories include “farming,” “betel leaf cultivation (*paan*),” “business,” “day labour,” “fishing,” and other miscellaneous activities. Because betel leaf (*Piper betel*) cultivation (hereafter called “*paan*” for short) is a major means of subsistence in Cox’s Bazar District and because it affects the state of forests negatively by consuming forest products for building cultivation facilities [10, 17-19], income from *paan* cultivation is separated from other farming income in this analysis. For the first two categories, respondents were asked to estimate the gross sales of products, and the cost of operating such activities. Income was derived by the amount of sales deducted by the cost. Income figures of separate categories are added together to derive the total annual income of the household (Table 3).

The mean total annual income of all households inside TWS is 123,900 BDT. Among the “inside” groups, B-Legal households are much better off than the
there is no clear pattern that characterize the difference. Rather, the minority ethnic groups regardless of their legal status tend to depend on day labouring presumably due to the lack of other resources, such as land.

Compared these “inside” groups with the outside, the contrast in subsistence patterns is clear. The dependence on farming including paan cultivation is much heavier inside TWS (45%) than that outside (13%). On the other hand, fishing is much more important outside TWS presumably because Kader para is located near the coast. Income from business activities is also more outside TWS than the inside.

C. Residential History

Legal dwellers have stayed longer in TWS; more than 50% of both Chakma and B-Legal households have lived longer than 50 years. In contrast, encroacher households (B-Enc & Rohingya) appear to be relatively new comers to this area (Table 5). More than 50% of B-Enc households and all Rohingya households have lived in this area for less than 25 years (Fig. 3). The pattern of habitation length outside TWS seems similar to that of legal dwellers inside, but many households outside have existed even longer than the inside.

IV. Summary and Discussions

The objective of this study is to characterize “local people” near a site of deforestation. These local people are analyzed in several attributes including legality, ethnicity, income,
Table 5. The number of households by group and by length of habitation (years).

<table>
<thead>
<tr>
<th></th>
<th>10&gt;</th>
<th>10-24</th>
<th>25-49</th>
<th>50-99</th>
<th>100=&lt;</th>
<th>Total*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chakma</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>B-Legal</td>
<td>7</td>
<td>8</td>
<td>13</td>
<td>12</td>
<td>18</td>
<td>58</td>
</tr>
<tr>
<td>Subtotal-Legal</td>
<td>9</td>
<td>10</td>
<td>16</td>
<td>21</td>
<td>27</td>
<td>83</td>
</tr>
<tr>
<td>B-Enc</td>
<td>14</td>
<td>27</td>
<td>23</td>
<td>10</td>
<td>0</td>
<td>74</td>
</tr>
<tr>
<td>Rohingya</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Subtotal-Encroachers</td>
<td>20</td>
<td>28</td>
<td>23</td>
<td>10</td>
<td>0</td>
<td>81</td>
</tr>
<tr>
<td>B-Outside</td>
<td>5</td>
<td>7</td>
<td>14</td>
<td>12</td>
<td>41</td>
<td>79</td>
</tr>
</tbody>
</table>

* This table includes only households for which the length of habitation was recorded. Therefore, 7 households inside TWS and 6 outside TWS are excluded from the calculation.

subsistence activity, and the duration of habitation.

According to the above analysis, profiles of these ‘local people’ can be summarized as follows:

About one-half of the dwellers in the reserved area are encroachers. Those encroachers are mostly Bengali in ethnicity, but include some Rohingya refugees from Myanmar. Legal dwellers include both Chakma and Bengali households. Among the dwellers inside TWS, legal Bengali households earn the highest income; illegal Bengali households earn significantly less than the legal counterpart. The income of two minority groups, Chakma and Rohingya, is still lower than Bengali encroachers. While the overall average of the dwellers inside is lower than that of outside, the income of legal Bengali group is comparable to that of the outside residents. Subsistence activities are contrastive between the inside and outside dwellers. People inside are engaged in much more agriculture, while those outside practice fishing and business. The minority groups inside heavily rely on day laboring for living.

As the implication of these findings in deforestation in this area, some observation can be made. First of all, a large number of people live inside the supposedly closed area for wildlife. These people affect forests by consuming forest products, such as fuelwood, building materials, etc. People also clear the forested land to make homesteads. Moreover, their major means of subsistence is farming that affects more on the state of forest than other occupations such as business and fishing, ones more popular outside TWS. For farming, forested areas would be cleared out to make agricultural fields. Paan cultivation uses up more forest products by building facilities called paan boro[17,18].

A second point is that at least one-half of these people inside are poor encroachers. Although Rohingya refugees are sometime blamed for degrading forests in Teknaf [14, 20], there are only a few Rohingya households in this study area. Rather, there are many Bengali encroachers. New encroachers seem to be continuously flowing in. Twenty-five percent of all encroachers have lived there in less than 10 years; more than 50% less than 25 years (Fig. 3). Compared with legal dwellers of Bengali, these encroachers earn 40% less. It may be a reflection of the fact that poorer segments of the society struggle to find a way to survive, and that they attempt to take advantage of “free” resources in the reserved forest to make their living. That is, the poverty is a major driving force of deforestation in this area. Therefore, if more people become impoverished, some of them may have no choice but moving into the forest to use free resources.

Fig. 3. Cumulative percentages of the length of habitation in years by legal dwellers in TWS, encroachers, and dwellers outside TWS.

V. CONCLUSIONS

This study shows that half of dwellers in a reserved forest area usually closed for human activities are not entitled to live in that area. The government, however, does not seem to be able to control people’s movement into the reserved area effectively. As this analysis
shows, the inflow of encroachers steadily continues. It is feared that such new settlers in the reserved area would further degrade the condition of already damaged forests because of the very presence of their homesteads and the pressure from cultivation of paan and other crops on the forest. It seems crucial to somehow put human activities in control if the forest should regenerate in the near future.

In order to devise ways in which reforestation would occur, at least a few things seem to be studied in future research. First, the system of forest villagers needs to be revisited. Although this institution was implemented to facilitate better management of forests by the Forest Department, they do not appear to do such tasks. Second, the characterization of encroachers needs to be expanded, because this study only examines a small portion of the area, too small to allow any generalization. Lastly, because a major motivation of the encroachment into the reserved forest appears to be poverty, some means of income generation, at least for the forest villagers, should be investigated in order to ease the reliance of the poor on natural resources.

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