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SHORT COMMUNICATION

DEFORESTATION AND BIODIVERSITY DEGRADATION IN MADHUPUR *SAL* FOREST AT TANGAIL REGION

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Abstract: The study was conducted to investigate the deforestation and biodiversity degradation in Madhupur sal forest of Tangail region during April to September 2010. Households from different garo villages of two selected unions under the forest were contacted for interview to identify the resource consumption pattern and to know their views about deforestation and biodiversity degradation in the forest. Various commercial activities such as large scale plantation of pineapple, banana and papaya trigger the environmental degradation inside the forest through many ways therefore degrading the remaining forest patches, soil quality of the forest and reducing the forest biodiversity. Most of the respondents mentioned that major causes for biodiversity loss including deforestation followed by commercial logging, loss of habitat and lack of conservation initiatives. Results of the study suggested that restriction on human interference inside the forest is the effective solution for reducing deforestation and biodiversity degradation. The study identified that the loss of biodiversity in the forest depended on the effect of deforestation, threats to indigenous livelihood, enhanced greenhouse effect, lowering ground water levels and soil erosion, respectively.

Keyword Environmental degradation, deforestation, Madhupur *sal* forest

Forests are among the most diverse and widespread ecosystems on the earth and millions of people living in most tropical countries derive a significant part of their livelihoods from various forest products which play a vital role to the livelihoods living in or adjacent to the forests. More than 1.6 billion people throughout the world relying heavily on forests for their livelihoods and some 350 million people depend only on forest both for their subsistence and income (WB, 2002). In last several decades, deforestation and biodiversity degradation became a common event throughout the globe. This phenomenon is much more frequent in developing countries like Bangladesh. During the last two or three decades, the forest cover of the country decreased from nearly 20 to 9%. Of late as a signatory of various regional and international conventions, treaties and protocol, government has taken various initiatives to address the situation and to ensure the conservation of remaining floral and faunal diversity (Brown and Durst, 2003). The annual deforestation rate in Bangladesh is 3.3% which is the highest among the south-east Asian countries (Poffenberger, 2000).

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The historic Madhupur garh is a pleasant forest area located in central Bangladesh, lies predominantly in the Pleistocene terrace of Tangail district, which is situated between the river Banar in the east and Bangshai in the west. Geomorphologically, the garh is a part of the Modhupur tract and topographically it is raised a few meters above the level of the surrounding flood plains, which decrease in forest coverage about 36% between the years 1975 and 1983 (Khaleque, 1992). It is estimated that within the years 1977 to 1991, the deforestation in Modhupur sal forest became 56% and if this rate continues, it becomes obvious that the remaining sal forest will be disappeared totally very soon. At present, around 62000 hectares of land of Madhupur garh have been used for banana cultivation. According to the local Forest Department, monoculture cropping is the greatest threat to the remaining scattered forest patches of Modhupur garh (Dey, 2004).

Madhupur sal forest, the third largest forest of Bangladesh, once home to countless species including medicinal plants, fruit trees, uncultivated vegetables, herbs, creepers, has been transformed into gardens of rubber and fuel wood, banana, pineapple and papaya. Over the last two and a half decades the forest landscape of the country has undergone massive changes that were environmentally detrimental. The natural forest has disappeared along with its rich biodiversity, causing immeasurable and perhaps permanent loss to the environment. The loss of the indigenous forest has also devastated the life and livelihood of the indigenous (ethnic minority) people. The invasive and exotic species, particularly eucalypts and acacias were sown by the forest department cutting away thousands of sal coppices. The sal forests were further denuded to give way for cultivating banana, papaya and pineapple, another state intervention that threatened the natural forests.

According to BBS (1999), deforestation causes a decrease in catchments areas water-holding capacity, increased soil erosion, and the loss of habitats and biodiversity, which impacts on economy, was estimated at 1% of GDP. However to minimize deforestation and biodiversity loss in the sal forest, the following objectives were carried out: i) to assess the major causes of deforestation, ii) to identify the causes responsible for biodiversity loss and depletion of the forest resources, and iii) to investigate the present condition of flora and fauna in the forest.

The study was conducted in the selected areas of Madhupur sal forest under the Madhupur upazila at Tangail district. According to Ahmed (2009), the total area of the Madhupur sal forest under Tangail district is about 46,000 acres (186 Km^2), among them 7,800 acres have been given out for rubber cultivation, 1000 acres to the Air Force, 25000 acres have gone into illegal possession and the Forest Department controls only 12,200 acres of the forest area. It should be mentioned that the last remains of the forest were mainly found in and around Arankhola and Sholakuri union parishad of Madhupur upazila. The questionnaire survey was conducted in selected villages namely the Chunia and Jalchatra under the Arankhola union; and Dhokhola and Hagrakuri under the Sholakuri union. In this study, the methods of data collection were interview with key informant, questionnaire survey and focus group discussion (FGD) with the local people in the forest. The electronic and web based information was also used for data collection. The total population of the two selected unions was 75,864 (MUPC, 2001). It is mentioned that the forest was surrounded by four unions, among them two unions namely Arankhola and Sholakuri were selected by using simple random sampling method. From these two unions a total of four villages (two villages from each union) were chosen randomly and 20 respondents from each of the villages were selected for interview through simple random sampling method. Both primary and secondary data were used in the study. Primary data was collected by using the interviews of the key respondents from the selected areas. Data were collected from the selected areas from a total of 80 respondents through questionnaire survey. Secondary information was collected through reviewing research journals, newspapers, books, and from the internet. After completion of the field survey, the obtained information from the respondents was compiled and presented.

The study revealed that 63.75 and 36.25% respondents were male and female, respectively and the majority of the respondents (30%) were 21 to 30 years of age group (Table 1). The results of the study showed that 32.5% of the respondents were illiterate followed by those having primary education 25%, secondary 20%, higher

Table 1: Characteristics of the respondent with biodiversity loss in the study area (n=80).

Phenomena	Frequency	Percent (%)
Sex: Male	51	63.75
Female	29	36.25
Age group (Yrs): 10-20	06	07.50
21-30	24	30.00
31-40	23	28.75
41-50	19	23.75
>50	08	10.00
Occupation: student	11	13.75
day labor	11	13.75
business	32	40.00
farmer	11	13.75
service holder	15	18.75
Education: Primary	20	25.00
Secondary	16	20.00
Intermediate	12	15.00
Graduate	06	07.50
Illiterate	26	32.50
Family size (No.): 1-3	05	06.25
4-6	40	50.00
7-9	31	38.75
>9	04	05.00
Income (Tk): 3000-6000	34	42.50
6001-9000	20	25.00
9001-12000	10	12.50
>12000	16	20.00
Firewood coltn. (kg): <3	14	17.50
3-5	24	30.00
5-7	20	25.00
>7	22	27.50
Living duration (Yrs): 10-20	17	21.25
21-30	33	41.25
31-40	13	16.25
41-50	11	13.75

secondary 15% and graduate 7.5% (Table 1). Most of the respondent's occupation was business (40%) followed by service (18.75%). Monthly income of respondent's 42.5% was Tk. 3000 to 6000 followed by 25% was Tk. 6001 to 9000, 20% more than Tk. 12000 and 12.5% Tk. 9001 to 12000. The family members ranged from 4 to 6 were the highest and more than 9 was the lowest (Table 1). The living duration ranged from 21 to 30 years as a resident in the forest was the highest and more than 50 years was the lowest (Table 1). It revealed that 38.75% of the respondent mentioned that threats to biodiversity is the main effect of environmental degradation in sal forest followed by threats to local economy 23.75%, threats to native forest 20% and threats to livelihood of local people 17.5% (Table 1). In the study 30, 27.5, 25 and 17.5% respondents

mentioned that they collected 3-5, 7, 5-7 and 3kg firewood from the forest per day, respectively (Table 1). The commercial activity triggering the environmental degradation inside the forest in many ways such as by degrading the remaining forest patches, loss of soil quality and loss of biodiversity (Table 1).

Table 2: Way, effects and causes of degrading forest environment through commercial activities and suggestion for reducing the deforestation (n=80).

Phenomena	Frequency	Percent (%)
Way of degradation		
By soil quality	26	32.50
by forest patches loss	31	38.75
by biodiversity loss	23	28.75
Effects of degradation		
threats to biodiversity	31	38.75
threats to local economy	19	23.75
threats to livelihood	14	17.50
threats to native forest	16	20.00
Causes of biodiversity loss		
deforestation	27	33.75
anthropogenic activities	21	26.25
less conservation initiatives	13	16.25
Suggestions		
buildup public awareness	17	21.25
reducing monoculture cultivation	15	18.75
restriction on human interference inside the forest	24	30.0
stop the deforestation	8	10.0
Govt. initiatives to save the forest	16	20.0

The present situations indicated that the complete destruction of the sal forest at Tangail region is only a matter of time. So, for reducing environmental degradation in sal forest, some appropriate forest conservative approaches should be taken through the government initiatives in collaboration with the international organizations and non-government organizations. Today, most of the forestland in Madhupur has been denuded, degraded or encroached upon or taken over for the commercial production of pineapples or bananas or the industrial plantation of rubber or exotic fuel wood species (Gain, 2002). Geographically, Bangladesh falls near the Indo-Burma region which is one of the ten global prime spot areas and supposed to have 7000 endemic plant species. Due to its unique geophysical location, Bangladesh is exceptionally characterized by a rich biological diversity (Hossain, 2001; Chowdhury, 2001). Unfortunately, due to country's enormous deforestation rate, a lot of mammals, birds, and reptiles are now under tremendous pressure. Already several important wild lives have extinct from the country (Rahman, 2004).

For the minimization of environmental degradation at Madhupur sal forest, some appropriate steps should be taken through the government and by all of the concern authorities both national and international. Finally, the following recommendations should be implemented to save the forest from degradation as well as to conserve the sal forest and to overcome the existing situation: i) destruction of forest through commercial logging should be stopped, ii) restrictions on human interference in the forest should be maintained, iii) degradation of biodiversity through social forestry should be stopped, iv) conversion of forest to agricultural fields should be stopped, and v) government should take proper initiatives in collaboration with international organizations to save the forest from degradation. Sincere thanks to the Social Science Research Council,

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