COMMERCIALIZATION OF INDIGENOUS ECONOMY AND ITS IMPACT ON THE ENVIRONMENT OF MODHUPUR GARH, BANGLADESH

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INTRODUCTION

The degrading status of the natural sal forest of Modhupur Garh has pushed the local Garo community towards cash crop cultivation at the expense of a once thriving subsistence economy. The development of transportation networks permitting greater access to the forest has also contributed enormously to the commercialization process in previously remote areas. Cash crop production started with pineapple cultivation followed by banana monoculture, the latter of which has been identified as a threat to the Modhupur environment by environmentalists. It accelerates the destruction of remaining forest patches, degrades soil quality and increases vulnerability of local flora and fauna species. Moreover, excessive use of agrochemicals by commercial plantations has raised serious concerns and is considered also to be a direct threat to both Indigenous populations' and consumer health. Expansion of the commercial economy has exacerbated landlessness, poverty, and gender discrimination among the Garos. These trends have also led to increased numbers of Garos working as wage labourers in plantations and migrating into local cities in search of employment leading to the loss of traditional cultural and economic security. This exploratory study assesses how various aspects of Garo society have been impacted by this slow shift from a subsistence economy to participation in the dominant commercial economy.

METHODOLOGY

Primary data and secondary literature have been utilized to produce this study. A reconnaissance survey was conducted in the Modhupur region which was followed by a semi-structured questionnaire randomly delivered to 50 Garo and 30 Bengali female respondents. The primary researcher lived with a Garo family in the Gachabari village of Modhupur in an attempt to gather relevant data collected through formal and informal interviews. Prior to and following the creation of a database to help guide the research several visits into the forest area took place. In order to qualify the extent of land use in the Modhupur forest, satellite images of the region from various years were drawn from the Global Landcover Facilities, Global Land Cover

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Facilities and from Centre for Environmental and Geographic Information Service in Dhaka and compared to a map prepared by the Survey of India in 1928. Other relevant spatial data were incorporated through a GPS survey and field observations. Information regarding biodiversity of sal forest have been collected in several ways, including a secondary source literature review level of various academics working on like issues, documents of Bangladesh Bureau of Statistics, the Department of Forest and Environment, and reports from local forest offices and non-governmental organizations such as the Bangladesh Research Centre for Indigenous Knowledge and Society for Environment and Human Development.

According to the Tangail Forest Division, in 2004 Modhupur Garh forest covered about 46,000 acres (186 sp. km) of land in the Tangail district and about 17,000 acres (69 sq. km) in the Mymensingh district. This study is confined to the Modhupur Garh forest region which is placed under Modhupur Upazila, or second tier administrative unit for the Tangail District. It should be mentioned here that the last remains of sal forest are found mainly in the Arankhola Union Parishad, the smallest administrative unit of Modhupur Upazila. For this reason, the questionnaire survey was delivered in 10 Garo villages of Arankhola Union. To gain an in depth understanding of the region and knowledge of the local communities, specifically three Garo communities (Chunia, Gaira and Gachabari) were selected for intensive study (Figure 1).

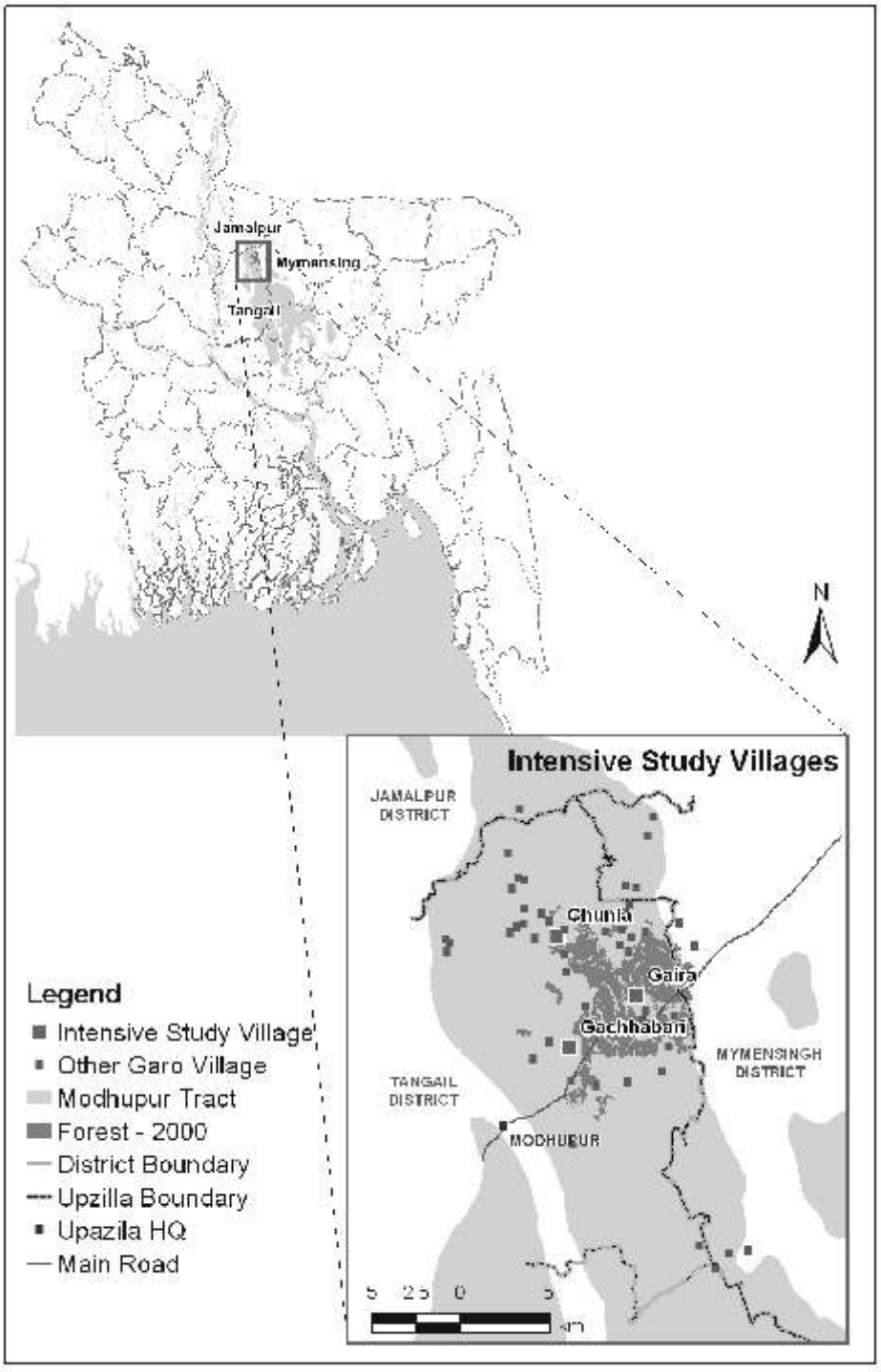
AN OVERVIEW OF COMMERCIALIZATION OF INDIGENOUS ECONOMY

Historic Modhupur Garh is a forest region located in central Bangladesh. It is located predominantly in the Pleistocene terrace area of Tangail district, which lies between the River Banar in the east and Bangshai in the west (Bangladesh District Gazetteers, Tangail, 1983, p. 12). Geomorphologically, Modhupur Garh is a part of Modhupur Tract and topographically positioned a few metres above the level of surrounding flood plains (Khaleque, 1992, and Burling, 1997). Modhupur Garh forest is also known as Modhupur sal forest. A valuable timber species, sal is the predominant tree species of the forest that was once famous for housing unique wild life, its dense tree coverage, rich biodiversity and forest dwelling ethnic communities, in particular the Garos who claim to be the forest's earliest inhabitants. Only a few decades ago, the Garos subsistence economy was totally dependent on abundant forest resources. The matrilineal Garos produced the bulk of their household consumption items through slash and burn cultivation, locally known as jum. They also collected fuel, fodder and numerous wild edibles from the jungle. Perhaps for this reason, they expressed little interest in wage work or in trade (Playfair, 1909).

Slowly the traditional economy began its shift towards a commercial model which soon became quite rapid due to the regional introduction of pineapple production in 1939 which the Garos embraced. Pineapple plantations were well-suited to the Modhupur region's topography and soon thereafter the community began to convert their abandoned jum plots into pineapple orchards. This unfortunately was largely the reason for the destruction of forest lands. Garos continued to practice jum in the higher forest blocks covered with bushes and trees (Khaleque, 1992, p. 107). They prepared the soil for crop cultivation by clearing and then burning the forest. They grew between 50 and 60 types of paddies known as dry rice in their jum plots in addition to crops like chillies, white sesame, banana, melon, watermelon, different types of potatoes, arum, cucumber, pumpkin, egg plant, kalai dal (one type of pulse), different beans, ladies finger and many more items for home consumption. They also produced cotton for weaving clothes and cane for making household utensils and similar items. According to Gain (2002), the maximum period for such cultivation in the Modhupur forest was three years. After that the land was left fallow to naturally regenerate. Thus the sal forest remained intact and the forest people lived in peace.

According to Gain (2000) degradation of sal forest began with the imposition of British colonial rule fuelled by interest in localized timber stocks. This resulted in the construction of the Mymensingh-Tangail Highway through the jungle during the Second World War, which contributed directly to the massive destruction of the forest's biological resources. At the same time the high-

Figure 1 Location of Study Area in Bangladesh



Source: Dey, 2004

way and a second road constructed in the mid-1950s opened the forest to outside interests. The development of this transportation network in the end encouraged illegal tree felling and the expansion of the market economy. In order to conserve the biological resources, the Forest Department formally banned jum cultivation in the early 1950s and restricted entry to the jungle region. Since then the misery of the forest dwelling people intensified. The heavy reliance on the forest resources began to decrease and the people were pushed to adopt a new livelihood. In the early 1960s, when part of Modhupur Garh was declared a national park, the Forest Department began to prohibit these practices among the Garos, although they continued growing pineapples in their already established gardens.

Over time, the Garos began to grow ginger, arum, mustard and many other crops in what had become increasingly denuded and degraded forest plots. At the same time increased growing demand of cultivable land led to the forest being cleared to assist monoculture cropping. The excessive use of agrochemicals also became more common, so much so that the local Forest Department office was forced to centre out the recently introduced banana monoculture as a threat to the natural and social environment of Modhupur. Banana monoculture has become hugely popular resulting in changes to typical Modhupur land-use patterns within a very short time span leading to the bulk of the forestland being denuded, degraded, encroached upon and, in certain cases, completely overtaken for commercial pineapple and banana production. It is also utilized for industrial rubber plantations or to produce exotic wood-fuel species (Gain, 2002). At present pineapple, banana, ginger, arum, jackfruit, mango, olive, litchi, potato, papaya, and sugar cane, among others, have been produced in Modhupur Garh for market consumption.

Monoculture cropping is also seen in Modhupur in the form of industrial plantations like rubber monoculture and plantation of exotic fuel-wood species in the name of social forestry. These types of commercial plantations are launched by international donor agencies like Asian Development Band and the World Bank with direct involvement of the Forest Department, Government of Bangladesh.

IMPACT OF COMMERCIAL ECONOMY

(a) Natural Environment

Loss of Forest Patches

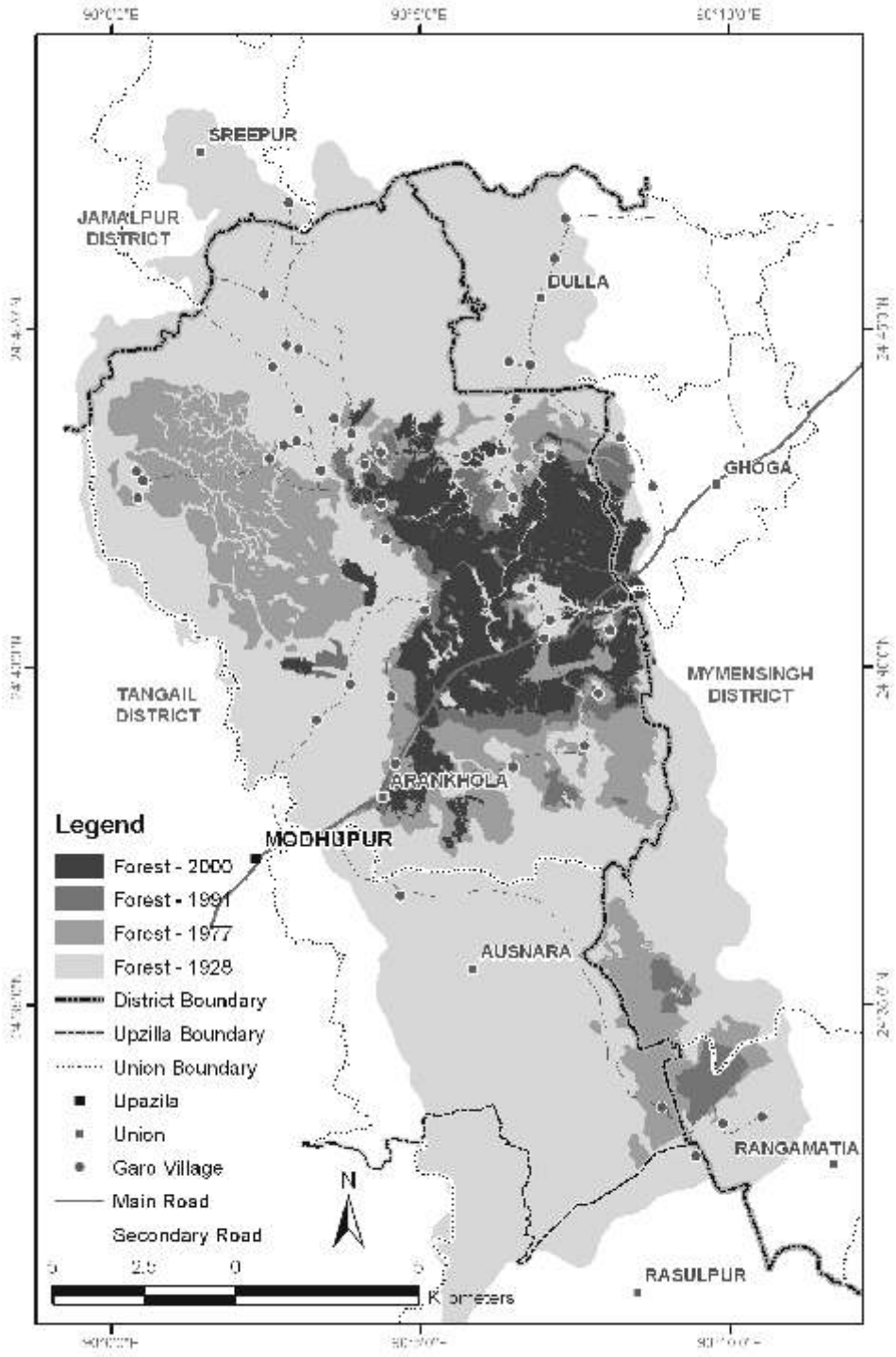
According to the map prepared by the Survey of India in 1928, natural sal forest extended over the whole land area of Modhupur region and covered close to 80,000 acres. Forty-nine years later, satellite image analysis discovered that the forest coverage had shrunk to about 25,700 acres. This was an alarming trend for it demonstrated not only a constant level of forest degradation and increased land usage, but further analysis shows that the rate of natural forest destruction has recently become more rapid. Satellite imaging from 1991 demonstrated further that the natural forest coverage of Modhupur Garh had dropped again resulting in a loss of close to 14,400 acres in 14 years. This trend has continued: in 2000 natural forest coverage had dropped to 8,400 acres (Figure 2).

The decrease in forest coverage of Modhupur Garh between the years 1975 to 1983 was calculated by Khaleque (1992) at nearly 36 per cent. It was further concluded that deforestation in the Modhupur region amounted to 56 per cent, or an average of 4 per cent per year, from 1977 to 1991. If this rate continues, academics warn, it is clear that the remaining sal forest is destined to disappear. Commercial agricultural has absorbed large tracts of forest territory for banana production as trees surrounding the Garos home territory are cut down (Figure 3). Currently some 153,243 acres of Modhupur Garh land have been appropriated for banana cultivation. According to the local Forest Department officials, monoculture cropping is the greatest threat to the remaining scattered forest patches of Modhupur Garh (Dey, 2004).

Soil Degradation

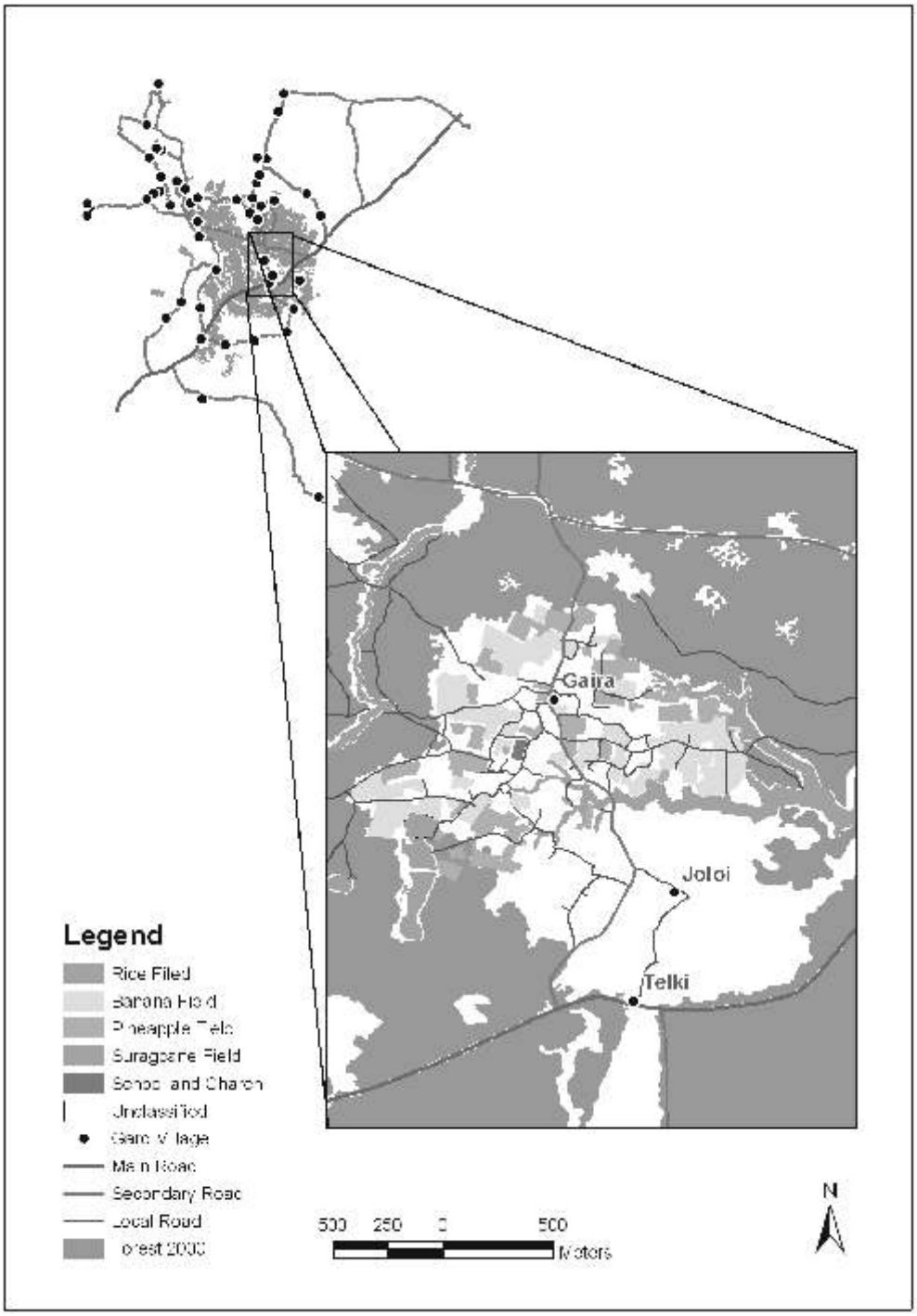
Improper soil management methods results in serious soil degradation, causes pollution, and exacerbates erosion. Treating the soil with chemical fertilizers, pesticides, and fungicides interferes with the natural processes that occur within the soil while destroying bacteria, fungi, and other useful micro-organisms. In most cases in Modhupur, commercial agriculture follows monoculture cropping at the expense of crop

Figure 2 Decreasing Natural Forest Coverage of Modhupur Garh (1928–2000)



Source: Dey, 2004

Figure 3 Typical Landuse Map of a Garo Village (Gaira)



Source: Dey, 2004 and Tojo, 2004

rotation. Such an approach is largely responsible for soil nutrient deficiency that, should it continue, may lead to soil infertility. Excessive use of agrochemicals in the fields has also raised serious concern of environmentalists. Additional issues such as severe land and water pollution can not be excluded.

Loss of Biodiversity

The current vascular plant diversity of Modhupur Garh numbers nearly 176 species, 140 species of birds, 19 species of mammals, 28 species of reptiles and four species of amphibians (Chemonic International, 2002). It is estimated that as land falls to commercial cultivation, current deforestation rates of nearly four per cent annually may increase, posing a direct threat to the rich regional biodiversity. The excessive use of agro-chemicals in commercial plantations has also resulted in poor water quality which in turn has left aquatic habitats of shapla, shaluk, shell, tortoise, to name a few, vulnerable to various poisons. This has led to the extinction of fish species such as raga and pipihoile. Commercial cultivation resulting in market dependency has also led to the disappearance of various crops including between 50 and 60 types of dry rice and lesser known vegetables.

(b) Socio-economic Environment

Landlessness and Poverty

Commercial cultivation has in recent times encouraged the transfer of land to people living outside the region who expressed an interest in agro-business. In exchange for a small amount of money adivasis are leasing their land to outsiders for between five and 10 years. In most cases, such an arrangement results in landlessness as money lenders later acquire the property. Commercial land use does not mean that the local people are benefiting from such plantations; rather it appears as though the poor are becoming poorer and the rich are becoming richer. Although most of them have a minimal level of education, the Garos remain naïve to such mechanizations as striking poverty results from landlessness. This ultimately leaves many Garo working as wage labourers on Bengali plantations located in former Garo territories. Their former role as producers has been exchanged for one of marginalized employee working in the production sector.

Marginalization of Women

As mentioned above, decreasing forest resources have forced the Garos to integrate into the commercial economy. Ester Boserup (1970), in her influential book *Women's Role in Economic Development*, demonstrated that the introduction of new agricultural methods had a negative effect on women in the developing world. This resulted primarily from the forced change in the gender division of labour that led to women being displaced from their traditional areas of work. Such trends are discernable among Garo women of Modhupur Garh as their traditional agricultural roles and responsibilities have been transformed, thus in the long run results in less female control over the economy. For example, in jum cultivation females performed most of the tasks in a five-stage production cycle: women shared equally in two stages of production with males while the males were largely responsible for the final three stages in the subsistence economy (Table 1). Today Garo males dominate over the commercial production and females share responsibilities along with males in rice production.

It is clear that Garo women's previous position in agricultural production has changed. Previously, the females were found to work mainly in their own pineapple plantations, arum or ginger fields. Today most are engaged in rice production for home consumption, while almost all the Garo females work in kitchen gardens which demands less agricultural knowledge. Those who work outside the home do so in commercial banana plantations as day labourers. Although some are working in their own banana fields, more females are working exclusively as banana monoculturists thereby leaving their role as producers and adopting the role of wage labourers laden in tedious time consuming work associated with commercial production.

Threat to the Health Status

Various agrochemicals are used in the Modhupur region commercial agro-plantations to hasten the ripening of bananas and pineapples. Recently the media has grappled with this issue in various newspaper reports condemning the

Table 1 Gender Responsibilities in Jum Cultivation

	Major Responsibility		
Tasks	*Female*	*Male*	*Both*
Cutting and Lopping		M	
Clearing Undergrowth	F		
Burning			B
Making Stick for Digging		M	
Sowing Seeds	F		
Harvesting			B
Weeding	F		
Threshing and Winnowing		M	
Husking and Drying	F		
Storage	F		

Source: Dey, 2004

practice. It has been cited that 30 different types of growth hormones are currently being used in commercial plantations. Females working at banana plantations indicated in their interviews that chemical fertilizers like potash and urea are used in 15-day intervals. Further, hormones are sprayed on the fruit early on — a process that continues daily to ensure the healthy and quick growth of fruits; and after the harvest, farmers use additional hormones to maintain rapid ripening. As a result of this excessive hormone use, pineapples in certain instances were found to be rotten during the 2003 cropping season. As well, consumers have been suffering from various ailments such as dysentery, stomach pain, and vomiting, which have been associated with eating what are generally tasteless fruits.

The excessive use of pesticides and hormones has also become a significant concern for the producers. According to a recent Oxfam study, at least 750,000 cases of accidental pesticide poisoning occur each year resulting in 13,800 deaths worldwide. Of these, 10,000 occur in the third world. There are also chronic and long-term health effects such as various cancers, birth defects and induced sterility, for which no reliable data exist although officials believe they are directly related to similar agricultural practices. For example, women farm workers in the pineapple and banana plantation in Mindanao, Philippine, as well as rice and corn workers, were the first to notice that prolonged exposure to certain pesticides can actually cause spontaneous abortions and still births. Also cited were chronic dizziness and malaise, blurred vision, peeling off of nails and skin and swelling of the legs (Shiva, 1994, p. 119).

Through a questionnaire survey, some health problems of the Garo women who work in the agricultural plantations have been identified in Table 2.

Migration towards city

The introduction of cash crop production in Modhupur Garh in many regards is solely responsible for the abolition of nature oriented life pattern of the Garos. They are now more dependent on market to bear the necessities of day to day life, which finally has resulted in the increase of monitory demand. This has been resulted in Garos migrating towards cities, leaving the forest area. Bal (1999) has indicated that beginning in the 1960s, many Garos have started to migrate towards Dhaka. Dey (2004) found that a total of 40 Garo females and 33 Garo males from the surveyed 50 households migrated towards different towns of Bangladesh.

CONCLUSION

This preliminary study begins to map out some of the key concerns the Garo of the Modhupur

Table 2 Types of Health Problems Faced by the Women Working in Commercial Plantations

Problem	*Frequency*	*Valid Per Cent*
Headache	11	22
Vomiting	13	26
Sleeplessness	3	6
Numbness, Fever	5	10
Birth Complexity	2	4
Headache and Vomiting	6	12
Headache, Vomiting, Sleeplessness	4	8
No Response	6	12
Total	50	100

Source: Dey, 2004

region are contending with in the wake of the introduction of commercial agriculture which resulted in a need to integrate themselves into the now prevalent market economy. Beginning with the construction of the Tangail-Mymensingh highway during the British colonial period, the dark, dense sal forest was opened to outsiders for the first time. Over time the Modhupur regional transportation network has played a significant role resulting in the over-exploitation of forest resources, the destruction of biodiversity, as well as the expansion of commercial economy. The essence of the Garos traditional subsistence economy began to disappear following the formal ban on jum cultivation in early 1950s. Since then Garos engaged in cash crop production. Today, among many cash crops, banana monoculture has raised many questions among the environmentally conscious who fear that this will, in the long run, destroy the local forest ecosystem. Moreover, the socio-economic consequences of commercial economy need to be considered seriously. Arguably government and non-governmental initiatives should be taken to monitor the issue.

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