

State Policies, Praxies and Land-use in the Chittagong Hill Tracts of Bangladesh

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Abstract

Degradation of land and forest owing to unsustainable land-use practices, locally known as jhum, an extensive land-use characterized by frequent shifting of plot, has become a serious concern in Chittagong Hill Tracts (CHT) of Bangladesh. Policies and programs aiming at promoting alternative land use practices have been failed largely to achieve the desired goal. Conventionally, indigenous people are blamed as being conservative and not adopting alternative land use systems overlooking the constraints in adopting alternative land use practices. This paper questioned the conventional explanation and offers an alternative explanation by examining the state policies and associated effect on land-use in CHT over two centuries. It is revealed that the process of degradation has started during the British colonial period with the nationalization of land and forest and large scale commercial logging. It was accelerated by the establishment of reserve forest which abolished tribal people's customary rights and forced them to reduce the fallow period. The construction of a hydroelectric dam and encouragement of migration of lowland people into CHT had created further pressure on land and forced farmers to bring more marginal lands under arable cultivation for growing food or annual cash crops and increase the cultivation frequency. Horticulture, agro-forestry, and tree farming are also practiced in certain areas where land title and necessary support services were provided. It is concluded that the persistence of extensive land use practices is not because of indigenous people's adherence to traditional land use practices but because of failures of policies to create conducive environment. Policies conducive to promote economically and environmentally viable land use practices are outlined.

Key Words: State policies; land-use change; shifting cultivation, colonial period; post-colonial period; Chittagong Hill Tracts; Bangladesh

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1. Introduction

Degradation of natural resources particularly land and forest has become a serious concern in many parts of the world, particularly in developing countries where vast majority of the rural people depend largely on these resources for sustenance (FAO, 1999). Annually more than 15 million ha land is deforested in tropical countries. Deforestation is a major cause of soil erosion and land degradation. In Asia and South America deforestation attributed 40% of soil erosion (Barbier, 1999). More than 20% of vegetative land in developing countries is degraded. This rate is much higher in marginal fragile land and threatened the livelihood of the poorest 20% rural population who survive on poor marginal soil in the hills and mountains (Leonard et al., 1989).

Like other mountainous areas the Chittagong Hill Tracts (CHT), a hilly region in Bangladesh (Fig.1) is also undergoing deforestation and land degradation. Shifting cultivation, locally known as jhum, is a dominant land-use in the CHT. Clearing a patch of vegetation by slash-and-burn, growing assorted varieties of crops in the cleared land for one or two seasons and, then, moving to another plot is a major characteristic of this land-use. Growing annual crops on steep slopes by slash and burn, which is otherwise suitable for perennial crops has adversely affected the forest, land, and environment due to short fallow period caused by steady growth of population and other socio-economic and political factors (Gafur, 2001; DANIDA, 2000; Knudsen & Khan, 2002). Shifting cultivation and its associated fires have destroyed about two-thirds of forest of CHT (Farid & Hossain, 1988). Declining forest cover has accelerated soil erosion (BDGCHT, 1971; Razzaque and Roy, 1998; Shoaib et al., 1998). The continuous soil loss has lead to reduced soil fertility through nutrient leaching (Gafur, 2001). Deforestation and land degradation have adversely affected the livelihood of the indigenous people in CHT, as most of them solely depend on agriculture for their sustenance.

The question arises why traditional extensive land use is still dominant in CHT in spite of high population pressure? Land-use should be intensified with the population pressure to meet the increased food requirements as postulated by Boserup (1965). Conventional explanation blamed the indigenous people as being conservative and strongly inclined to traditional land use practices, which constraints the promotion of alternative land-use practices (Schilich, 1875 in BDGCHT, 1971, Forestal, 1966; Hamid, 1974; Sfeir-younis, 1993). Such simple explanation cannot be considered satisfactory as evidences from different countries such as Kenya (Tiffen and Mortimore, 1994; Ehui et al., 1995); Nepal (Thapa, 1998; Paudel and Thapa, 2001); Java in Indonesia (McCauly, 1980); and Thailand (Turkelboom et al., 1996) suggest that indigenous people adopt sustainable land use practices when necessary policy and institutional supports are available. The movement from extensive to intensive land-use is often conditioned and sometimes constrained by the national policies and laws (Lele and Stone, 1989; Vosti et al., 2001). Greetz (1963) showed that when such policy environment is unfavorable population pressure may lead to the situation of “involution” when existing systems are continued through internal readjustments instead of moving to next hierarchical system of intensification.

The history of external intervention in the land-use of CHT is more than two centuries initiated by British colonial administration through nationalization of lands and forests, creation of reserve forest, and commercial exploitation of forest resources which have had tremendous impact on land use and management. Despite growing concern about the unsustainable land-use and resource degradation in CHT (Shoaib, 1998; Uddin, et al., 2000;

Arya, 2000; Gafur, 2001), little efforts have been made to understand the impact of past policies and laws in influencing land-use and management. Insufficient understanding of past policies has led to narrow technical recommendation such as increased use of fertilizers, improved crop varieties, resettlement program, afforestation program, enhancing reserve forest, enacting stringent laws, and enhancing policing to conserve forest and land qualities. Most of them failed to achieve desired goal (Roy, 1995; Tripura, 1999) as they overlooked the structural constraints imposed by the state policies in adopting improved land use practices (Roy, 2002). It is now increasingly realized that policies and programs to promote sustainable land-use should be based on firm understating of the past; how past policies and course of actions conditioned the existing land-use practices (Niemeijer, 1996; Bryant, 1997, Hurst, 2003). This paper makes an attempt to fill up the gap by analyzing the past policies and laws evolved over a period of more than two centuries on land use and management in CHT. The organization of the paper is as follows. Section 2 provides brief description of study area and methods of data collection. Section 3 presents the policy changes under different regimes and associated land use changes. Section 4 concludes by highlighting policy implications for promotion of sustainable land use in CHT and elsewhere.

2. Study Area and Data

The Chittagong Hill Tracts (CHT) region is located in the south-eastern part of Bangladesh between 21.25⁰ and 23.45⁰ north latitudes, and between 91.45⁰ and 92.50⁰ east longitudes (Fig. 1). With an area of 5,089 square miles it covers about one-tenth of the Bangladesh territory, and is surrounded by India in the north and east, Myanmar in the southeast, Chittagong district in the west and Cox's Bazar in the southwest. Two-thirds of the area is characterized by steep slopes; the remaining area comprises of undulating topography. Steep slopes combined with heavy seasonal rainfall (ranges 2032 to 3810 mm) pose serious limits to arable agriculture. A soil and land-use survey conducted in 1966 found that 73% of the land of CHT is suitable only for forest, 15% for horticulture, and only three percent for intensive terraced agriculture (Forestal, 1966; Brammer, 1986). There are 12 ethnic groups (Mongoloids) known as 'tribes', comprising more than half of the total population. The other people are Bengalese, who had migrated into the area from the neighboring plain region.

This study is based on both secondary and primary information. Information on various periods of CHT are mainly drawn from secondary sources including, colonial reports, official documents (i.e. gazetteers, official correspondence), diary of colonial administrators, travelers, books, journals, and census. This information was supplemented by primary information including field visit, conducted during January to July in 2002, discussion with elderly persons, group discussion and key informant interviews.

3. Policy Shifts under Different Regimes and Associated Land-use Changes

Bangladesh evolved through a long process of political and administrative changes extending over a period of several centuries. The country, which was a part of the greater India, comprising present day India, Pakistan and Bangladesh until 1947, was colonized by Britain during 1760-1947. Following the freedom from colonial rule in 1947, Bangladesh became a part of Pakistan and continued to remain so until its emergence as an independent nation in 1971. Land policies adopted during different politico-administrative periods had direct bearing on land-use in CHT. This section analyzed how change in policies and laws influenced the land-use in CHT. It begins with an analysis of the situation in the pre-colonial

period, followed by the British colonial period and finally post-colonial period (Pakistan and Bangladesh).

3.1 State Policies and Land-use During Pre-colonial Period (before 1760)

Before the colonization of India (comprising present day Bangladesh, India and Pakistan) by Britain in 1760, almost entire part of the CHT was covered with dense forest (Lewin, 1860; Forestal, 1966). Shifting cultivation was the only agriculture practiced by tribal people to meet subsistence requirements. *Dao* (a big knife), axe and dibble were the main agricultural implements used for land clearing and crop cultivation, and fire and human labor were the sources of energy used. Settlements were small and scattered and used to move from one place to another when fertility of farm plots declined at the place where they had settled. Cereals, oilseeds, vegetables and cotton were inter-cropped with the help of dibbles. Rice and Indian corn were the major cereal crops, while mustard and sesame (*Sesamum indicum*) were the major oil seeds cultivated for household consumption. Cotton was produced to weave cloths for household use, and the surplus was exchanged for other necessities. Exchange of goods was very limited, as everyone was producing the same thing and had little contacts with other areas due to difficult terrain and lack of transportation facilities. Farmers had to depend on external supplies of salt, cloths, agricultural implements such as *dao*, axe, and earthen potteries (Bessaignet, 1958; Serajuddin, 1971:52). Supplies of these commodities were not regular because of inaccessibility and restriction on trade between lowland and hill-people. In 1713, a Chakma tribe Chief, locally called *Raja* or the king, requested the Mughal emperor's representative in Chittagong for removal of the restriction on trade (Serajuddin, 1971:52) (Table 1). In turn, he offered an annual tribute to the government in the form of cotton, which was a major cash crop produced by hill tribes and had high market value (Serajuddin, 1971:52; Gain and Moral, 1998).

The opening of trade provided some opportunities to farmers in CHT to exchange their surplus cotton production for commodities that they did not have. However, it also became a means of exploitation, as the tribal chiefs got authority to collect taxes from the people of their own clan. Two chiefs belong to *Chakma* and *Marma* tribes were authorized to take care of the trade between CHT and the plains (Gain and Moral, 1998). In turn, they had received land grants from the government (Barua, 2001:34). Such arrangements turned tribal chiefs' as *de facto* representatives of the central government, which became instrumental in strengthening their control over local population in CHT (Gain and Moral, 1998:72; Barua, 2001). The chiefs had appointed local agents called *dewan*, *khiza*, *roaza* to help them collect cotton from farmers. As remuneration for their services, the agents were allowed to keep certain percentage of the collected cotton. Such forced payment of tax combined with low market price of cotton due to monopoly over trade discouraged farmers from increasing cotton production. As a result, they continued practicing subsistence based shifting cultivation.

3.2 State Policies and Land-use During the British Colonial Period (1760-1947)

The CHT came under the British colonial in 1760 and remained under the British rule until 1947. This period can be sub-divided into two phases: i) from 1760 to 1860, when CHT, like other parts of the then colonized India, was ruled by the East India Company, hereafter referred to as Company as representative of the British Government and ii) from 1860 to 1947

when CHT was directly ruled by the British Government and introduced various policies and laws, which influenced land-use in CHT.

3.2.1 State Policies and Land-use During the East India Company Period (1760-1860)

The Company administration did not make any direct intervention in policy and administrative matters in CHT (Serajuddin, 1970) and largely followed the policy of exclusion and isolation (Barua, 2001). The Company's relationship with the CHT was limited to collecting tribute from the tribal Chiefs through Bengali commission agents. The commission agents were extorting high tax, leading to refusal of payment by a Chakma chief and his tribe members in 1783 (Serajuddin, 1970). The tribal communities were so frustrated that they attacked on the neighboring lowland villages and the lowland Bengali people were not allowed to enter into CHT to collect even forest products (Hutchinson, 1906). As a counter action, the hill tribes were not allowed to enter in lowland markets (Hutchinson, 1906). As a result, CHT became economically isolated from the regional commercial centers and some trade links developed earlier were also cut off. Given such situation, tribal communities had no alternative other than continuing shifting cultivation.

The tribal chief, who had rebelled, negotiated with the Company Government in 1787 in response to the assurance given that the middlemen system will be abolished. Following this, the Company started collecting tax directly through the tribal chiefs, eventually reinstating the chiefs' influence over tribal communities.

In 1789, the Company administration asked the Chiefs to pay tax in cash instead of cotton (Gain and Moral, 1998; Serajuddin, 1971:58) This policy forced farmers to grow cash crops and sell part of their products to pay tax. But it could not promote cultivation of suitable cash crops, because of lacking marketing facilities. Using waterways, only a small number of itinerant lowland traders used to buy local products and sell consumer goods in villages along rivers.

During this period, most land in river valleys remained unutilized because of inundation during the rainy season and local people's unawareness of wetland cultivation. A tribal chief had made effort to promote wetland cultivation by resettling some lowland people in his area (Khan and Khisha, 1970:25). However, such effort was localized and plough cultivation could not be widely accepted by the hill people due to lack of concerted effort. Local people also did not realize the need for agricultural intensification, as they had free access to abundant forestland for shifting cultivation.

3.2.2 State Policies and Land-use During British Administration (1860-1947)

In 1857, the British Government took over the direct administration of the Indian colonies, comprising present day India, Bangladesh and Pakistan, from the East India Company, and in 1860 the hills of Chittagong district was designated as a separate district known as the Chittagong Hill Tracts (Mohsin, 1997:28-29). Due to continued negligence and isolation, shifting cultivation was still the only form of agriculture practiced in the entire CHT (Lewin, 1969). The British administration condemned shifting cultivation as 'primitive' and 'destructive' land-use (Lewin, 1969) and adopted policies to replace it with sedentary agriculture. Captain Lewin, the first British Deputy Commissioner of CHT, in a letter to the Government wrote, "our object should be to put a stop to jum culture [shifting cultivation] and induce the people to settle and cultivate by the plough" (in Hutchinson, 1906:49-50).

Several policy measures were initiated to control shifting cultivation and promote sedentary agriculture during 1867-1900. Land leases were provided with inheritable rights for plough cultivation and establishment of villages along with provision of small advance repayable within five years with interest rate of five percent. As a punitive measure, a tax was imposed on shifting cultivation at a flat rate of Rupees four per household. These policies, however, achieved little success in expanding the area under plough cultivation; only 49 ha of land was under plough cultivation by 1872 (Khan and Khisha, 1970:25).

Several factors had constrained the expansion of plough cultivation. Firstly, the traditional practice of land tax collection by tribal chiefs was replaced with collection of tax particularly for land under plough cultivation directly by the local government, so as to reduce the influence of tribal chiefs on local population and increase the amount of land revenue. The chiefs were, however, still allowed to collect tax for land under shifting cultivation for which they got some financial reward. Realizing the possible financial loss and social status due to the new policy, the tribal chiefs made every effort to impede the expansion of plough cultivation (Hunter, 1876:80). Secondly, the land lease did provide usufruct rights to the farmers, but not rights to inheritance and transfer (Ascoli, 1918). In the absence of such rights, farmers did not want to take risk of making investment in land development required for plough cultivation. Besides, the amount of advance given to the leaseholders for initial investment was not enough to meet the costs of such as purchase of cattle, plough and other implements (Ascoli, 1918).

Plough cultivation and sedentary agriculture, however, started gaining acceptance among the indigenous people when the vast area about one-fourth of land of CHT (1,345 sq. miles) was declared as reserved forest during the early 1880s and shifting cultivation was restricted there. It reduced the availability of land for *jhuming*. This, combined with increased interaction of tribal communities with lowland people, who were practicing plough cultivation, paved the way for expansion of sedentary agriculture and plough cultivation. Tribal communities such as Chakma and Marma, who had settled near rivers close to the lowlands of Chittagong district, started practicing such agriculture increasingly. By 1900, 4,453 ha of land came under sedentary agriculture (Khan and Khisha, 1970). The process of adoption was further accelerated by the population pressure, enhanced knowledge about plough cultivation and decreasing crop yield under *jhum* due to shortening fallow period. In 1960 it reached more than 40,000 ha (Khan and Khisha, 1970).

During the period of British Administration, traditional subsistence crops such as cereals, oilseeds and vegetables had still occupied the major proportion of area under cultivation. Cotton, however, was gradually gaining importance as cash crop due to its high market value. Cotton growing gained so much prominence in CHT that it was known as *kapas mahal* or cotton region. According to Lewin (1869), annual export of cotton from CHT was about 2100 tons. India-rubber had also gradually gained importance during this period due to the increased linkage with the regional commercial center of Chittagong. During 1873-74, 25 tons of Indian-rubber was exported from CHT (Hunter, 1876). Tribal people used to bring India-rubber to market as far as from a distance of nine days' journey (Lewin, 1869). Bamboo was another important item sold in large quantity by tribal people in CHT (Hutchinson, 1906). Most of the goods were transported to the regional town of Chittagong through river ways on bamboo rafts (Hunter, 1876:84).

Livestock, particularly cattle were gradually integrated into the farming system by Chakma and Marma people who had adopted sedentary agriculture and started using animal

as draught power (Khan and Khisha, 1970). Despite gradual commercialization of their economy, socio-economic condition of majority of the people in CHT was not good. Most of them had to borrow cash from tribal chiefs and other rich people. Normally the borrowers had not to pay interest, but they were bound to serve the lender as bonded labor until the debt was paid back. The British government banned this system to free people from exploitation by local elite. But it could not provide intended benefits, as the government had not made provision of institutional credit to enable people to make investment in agriculture and buy daily necessities in the times of need. As shifting cultivation largely depended on weather condition, crop yields were very unstable. In a bad season, farmers were required to borrow cash to buy food crops. In the absence of institutional credit, tribal people had no alternative other than borrowing money from Bengali moneylenders with high interest rates and under unfair conditions such as, selling crops to the lender (Hunter, 1876: 86). This had not only led farmers to impoverishment, but also prevented them from adopting improved agricultural practices.

Along with agriculture, policy changes were taking place in the forestry. Immediately after taking over the administration of CHT from the Company, the colonial government made attempts to increase revenue from forest. In this pursuit, they established state control over forests by declaring almost all forests in CHT as government property in 1871 and eventually opening the forest for commercial exploitation. The government encouraged the extraction of forest products and invited traders to extract timber from forests; elephants were used to carry timber from remote areas. The annual average revenue derived from the forest products increased substantially after 1871 as a result of such aggressive forest exploitation policies. While annual average revenue from licenses and tools from forest products during 1862-71 was Indian Rupees 11, 000, in 1974-75 it increased to 102, 000 (Khan, 1998).

The process of deforestation was further intensified by the expansion of railway network, which required a huge amount of sleepers made from hard wood. Lewin (1870) reported:

“Throughout the whole (CHT) district are found large tracts of valuable forest trees.... A large trade in railway sleepers has lately sprung up from the port of Chittagong; the Port Conservator estimates that upwards of 30 000 sleepers have been exported during the last two years” (cited in Mohsin, 1997:90).

Indiscriminate exploitation of forests for timber and railway sleepers combined with shifting cultivation and lack of management practices had severely affected the forest resources. Within a short period forest resources depleted substantially and several important species such as *Jarul (Lagerstroemia spp.)*, *Toon (Cendrcia toona)* had disappeared from accessible areas (Schilich, 1875 in BDG CHT, 1971). In response to shrinking forests, teak seeds were imported from Myanmar and planted in some parts of CHT for commercial timber production. As a result, some natural forests were replaced by teak monoculture.

3.3 State Policies and Land-use During the Post-colonial Period

At the end of the colonial era in 1947, the British-India was divided into two independent, sovereign nations: India and Pakistan, which comprised the present day Pakistan and Bangladesh. Post-colonial governments largely followed colonial land and forest policies. This period witnessed the intensification of resource use due to construction of hydro-electric

dam and migration of lowland people to the CHT, which influenced the land-use considerably. In view of policies pursued and development interventions made, post-colonial period need to be sub-divided into two periods: Pakistan period, characterized by intensification of resource use for industrial purpose, and Bangladesh period, characterized by large scale migration of lowland people to CHT.

3.3.1 State Policies and Land-use During Pakistan Period (1947-1970)

After independence in 1947, Pakistan Government gave priority to industrial development over agriculture. To meet the increased demand for electricity for industry and urban areas, the government constructed a hydro-electric power project at Kaptai on Karnafuli river in the early 1960s. The reservoir inundated about 22,000 ha land (about 40% best arable land of CHT) and displaced about 100,000 people; 55% of them were plough cultivators. Some of the displaced people, with permanent land titles, were rehabilitated in reserve forests. The majority of evacuees without permanent land title were neither resettled nor paid any compensation. However the rehabilitation program initiated to resettle the farmers who had land title was also inadequate and compensation was insufficient (Rahman, 1998; Roy, 2002; Sopher, 1963). Permanent cultivators who were not properly resettled or not given adequate compensation were compelled to practice *jhum* fully or partly due to lack of alternative livelihood sources. Most of the displaced shifting cultivators moved to the upper parts of the hills and resumed *jhum* in fragile, marginal lands. Some of the shifting cultivators even encroached into the reserve forests, as they could not find other appropriate forest lands. In this process, major portions of Kasalong, Sitapahar, and Reinkhyong reserve forests were destroyed. It is reported that 65% of the Reinkhyong reserve forest was destroyed by shifting cultivators. (Forestry Master Plan, 1993). Shifting cultivators who had encroached into the reserve forest became more marginalized and vulnerable to further displacement due to inaccessibility and insecure land tenure. As shifting cultivation is prohibited in reserve forest they were under constant threat of eviction by the Forest Department. As a large number of shifting cultivators who entered in Reinkhong reserve forest during 1960 were forcibly evicted in 1970 (Roy, 1996: 58). This led to the perpetuation of *jhum* cultivation and hindered the adoption of locatioanlly suitable land-use such as horticulture and plantation agriculture.

The pressure on land was further reinforced by the government policy of encouraging lowland people to migrate to the CHT. Some migrants from India were resettled in CHT during the early 1950s. The government abolished the special status of CHT during the 1960s, which facilitated the large-scale migration of lowland people to CHT. As a result, within a decade between 1951 and 1961, the population of lowland Bengali in CHT had increased about five times, from 26, 000 to 119,000. Besides, declaration of some forests as 'protected forest', where shifting cultivation and collection of forest products were prohibited, accelerated the pressure on agricultural land.

As a result of the combined effects of the increased number of shifting cultivators, decreased area for *jhum* cultivation, and increased population contributed by mainly immigration, population pressure on land increased significantly. This forced shifting cultivators to reduce the fallow period. Normally, they used to keep *jhum* plots fallow for 15-20 years till the end of the 18th century. By the 1960s, the average fallow period had been reduced to 3-4 years (Khan and Khisha, 1970; Forestal, 1966), which adversely affected crop yields. The yield of rice, which was a staple crop, had declined from 303kg/ha in 1900 to 96 kg in the late

1960s (Khan and Khisha, 1970), which forced farmers to expand *jhum* cultivation to the extent possible to offset the food shortage arisen from dwindling crop yields (Barua, 2001:80; Khan and Khisha, 1970).

As regards the use of forest resources, Pakistan Government followed the British policy of commercial extraction and started industrial use of forest products. It created Forest Industries Development Corporation (FIDC), which introduced new methods of logging that facilitated the extraction of timber from inaccessible areas. To use forest products, paper, rayon, timber, pulp, plywood, and match manufacturing industries were established in the CHT (Rahman, 1998). In order to facilitate the collection of raw materials road networks were developed, which connected the main trade centers of the district to Chittagong and Cox's Bazar, two regional trade centers. As a result, the extraction of bamboo and soft wood, which were not extracted previously due to their low economic value, increased significantly. Having failed to earn subsistence requirements from *jhum* cultivation and permanent agriculture, many indigenous people found collecting bamboo and soft wood as a supplementary source of income. The newly adopted activity of forest products collection could not help much to improve their living condition, as they could earn a small amount of wage for cutting and carrying bamboo and soft wood to the nearest stream point. Both professional staff and laborers engaged in the industries were hired from outside the CHT and, thus, forest products based industries could not provide employment opportunities to local people (Rahman, 1998).

Realizing the adverse impact of shifting cultivation and necessity of rehabilitating degraded land, attempts were made by the government to promote horticulture based farming system in the late 1960s. About 3,000 households evicted by reservoir were allocated hill-slope land at the rate of five acres each household, with inheritable rights, for mixed horticulture. Some of them successfully adopted banana, papaya, pineapple and other horticultural crops as cash crops, while others could not succeed due to lack of knowledge, marketing and credit facilities (Khisha, 1982; Roy, 1998). In some areas government agencies had established rubber plantation, the on trail basis, but this land-use could not expand as private entrepreneurs did not come forward due to lack of knowledge and marketing facilities.

3.3.2 State Policies and Land-use After the Independence of Bangladesh (after 1971)

After independence of Bangladesh in 1971, the Government of Bangladesh implemented a resettlement program to settle lowland people in CHT at the end of 1970s. It is estimated that 200,000 to 450,000 lowland people were resettled in CHT (Roy, 2002:29). As a result of the continuation of this program, population density of CHT had reached to 84 km² by 1991. Most migrants were resettled in *khas* land or government-owned fallow land, which was actually community-lands being utilized by indigenous people for generations (Barua, 2001). Indigenous people considered such land as their community property and, therefore, did not pay attention to securing land title from the government agency. Few indigenous people had land titles. As a result, many indigenous people were evicted from their ancestral land for the second time after their eviction by the construction of Kaptai reservoir during the Pakistan period. This undermined any investment in land development and management, and the indigenous people continued practicing *jhum*. Due to repeated slashing and burning, natural forest species were replaced by secondary vegetation such as shrub and hardy grasses (Arya, 2000).

In 1992, government declared about 50,000 ha of forest land as reserve forest and 4000 ha was leased out for rubber plantation¹ (Mohsin, 1997). This combined with migration of lowland people further intensified pressure on land resources available for agriculture and forced shifting cultivators to shorten fallow period. In areas with valley land suitable for wet rice cultivation, irrigation canals were constructed, and chemical fertilizers and pesticides are applied to increase yield (BBS, 2001). Upland cultivation also further intensified, particularly near the roadside. Low land settlers, who lacked the knowledge of upland cultivation started commercial cultivation of vegetables such as cucurbits, beans and leafy vegetables, and root crops like aroid, ginger, turmeric, *mishti-alu* (*Ipomea batatus*) and *simul-alu* (*Manihot esculenta*) (Uddin et al., 2000) even in the steep slopes due to high market value. Improved road conditions facilitated the transportation of these commodities to Chittagong and other cities. As a consequence, the area under these vegetables constantly increased (Table 1). To maintain the yield, they adopted intensive management, including intensive tillage, and application of chemical and organic fertilizers. Gradually some indigenous communities such as Chakma, Marma and Tanchangya also began to adopt these agricultural practices (BBS, 2001; Uddin et al., 2000). Although this type of agricultural practices provided high return, but they accelerated the pace of soil erosion exceeding 100 ton/ha/yr (Uddin et al., 1992).

In some areas, where farmers have land title and access to market and support services, horticulture, agroforestry and tree farming being practiced increasingly (Table 1). Despite their high demand, widespread adoption of this type of locationally suitable land use practices, however, constrained by the government policies of giving several local government agencies to collect tax from agricultural commodities. Farmers and Agricultural Commodity Marketing Associations reported, that they have to pay toll (tax) to several local government organizations including Hill District Councils, Municipalities and Union Parishods for transporting and marketing agricultural products which depress the local price and eventually frustrated the local producers in adopting of such crops. The area under cotton, however, declining gradually due to its low yield and poor quality. Its market is gradually shrinking due to increased import of cotton facilitated by gradual liberalization of import regime.

Table 1 Area under non-cereal crops in CHT from 1950 to 1990

Crops	Year		
	1,950 (ha)	1,970 (ha)	1990 (ha)
Horticulture	1,340	6,860	16,780
Vegetables	Almost nil	1,300	6,940
Rootcrops*	Almost nil	4,310	6,680
Cotton	22, 980	9,040	231

* Rootcrops include potato, aroids, turmeric, ginger, and sweet potato,
Source: Uddin et al., 2000

¹ Most of these areas are denuded as most of the leaseholder are outsider mainly influential Bengali people, who do not have knowledge of or interest in rubber plantations. They have taken lease just to grab the public land with a speculation that in future it will be very valuable and it was instrumental to borrow money from bank with low interest rate in the name of rubber plantation (Gain, 1998; Mohsin, 1997).

Attractive profit provided a strong incentive to large-scale poaching and smuggling of forest products. Despite a ban on timber extraction, influential businessmen in collaboration with officials of the Forest Department and other agencies were primarily engaged in such activity (Master Plan, 1993; Huq, 2000:80). Due to illegal logging and expansion of agricultural lands, even reserve forests in CHT were steadily shrinking. In Kassalong reserve, forest area reduced to 89, 000 ha in 1991 from 150,000 ha in 1963. Likewise, In Rankhiang reserve forest, forest area reduced from 382,000 ha to 251,000 ha between 1963 and 1991 (BFRI, 2000).

To control illegal timber cutting, the government further tightened the punitive measures. In this regard, extraction and transit regulations concerning the transportation of timber from privately owned lands were also made stricter (Roy, 2002). Despite great potential of tree production in the CHT (Forestal, 1966), no effective policy was pursued to increase timber production by encouraging tree plantation on private land. Contrarily, private tree plantation initiatives were discouraged by the complicated permit system imposed on the sales of timber extracted from private farms. The rules required farmers to submit forestry officials detailed specification of timber to be sold (Rasul, 2003)². Due to excessive cumbersome bureaucratic procedures, it is hardly possible for small farmers to obtain the permit for timber selling without bribing the officials (Huq, 2000). As a result, small tree growers are compelled to sell timber to local traders at a much lower price than the market price, which have discouraged them from large-scale tree plantation.

² For details see Chittagong Hill Tracts Forest Transit Rules, 1973, and subsequent government order no 16/2000/147, Ministry of Environmenmt and Forestry date 16 march 2000. This rule is applicable to remove any tree from reserve forest, protected forest, unclassified state forest and private land.

4. Conclusions and Policy Implications

The analysis of state policies related to land-use in CHT over the period of more than two centuries illustrates the process and trajectories of change in land-use and agriculture in CHT. Significant changes have occurred in land-use over the past several centuries. Forest has been declined significantly and agriculture has been expanded in forests areas. Several patterns of agricultural land-use have been evolved from the traditional shifting cultivation. In valley lands where land title is unambiguous, land-use has been intensified with external inputs, although it consist a very small portion of the total land. Horticulture, agro-forestry, tree farming and other annual cash crops dominated by root crops: ginger, aroid, turmeric, are being practiced in certain locations. Jhum, traditional extensive land use system, however, is still dominant and expanded to more marginal and fragile land and fallow period has declined sharply and reaches to two to three years.

The patterns of change clearly show two trends; one is from shifting cultivation to sedentary agriculture in valley lands and horticulture, agro-forestry, and tree farming on hill slopes and another is from long fallow to short fallow shifting cultivation and cultivation of vegetables on steep slopes with extensive soil manipulation. The first path seems following Boserupian path of sustainable intensification and the second path seems following new Malthusian path of degradation. Now, question arises why majority of the farmers still practise traditional extensive land use system instead of following Boserupian path of intensification with innovative technologies and management? Is it because of indigenous people's culture and values their adherence to traditional land use or something else? The findings of this study offer some important insights about this question.

The foregoing discussion indicates that the genesis of degradation of land and forest resources in CHT is rooted in the past and present policies. Nationalization of lands and forests, creation of reserve forest, denying the customary rights of indigenous people on land and forest, entrusting the management of land and forest on government centralized agencies, construction of hydroelectric dam, frequent displacement of indigenous people and resettlement of lowland people into CHT have had severe impact on use and management of land and forest resources in CHT. Until the British colonial period, the entire region was covered with dense forest with valuable trees and shifting cultivation was practiced in certain patches for subsistence requirements. Shifting cultivation with long fallow had little damage on the forest and land as fallow period was long enough to regenerate vegetation and soil. The process of degradation started during the British colonial period with the nationalization of land and forest and large scale commercial logging. It was accelerated by the declaration of reserve forest which abolished tribal people's customary use and management rights to forest and forced them to reduce the fallow period. Policy of abolishing the special status of CHT, which facilitated the migration of lowland people to CHT, and construction of a hydroelectric dam for supplying electricity to outside the region without making sufficient arrangement for livelihood of the affected people or making appropriate provision to generate development process in the region through the revenue generated from the hydroelectric project, have intensified the pressure on land and forest. The inundation of the vast area combined with in-migration of the lowland people accelerated pressure on land resources, particularly in the

hill-slopes. In response to such pressure, majority of the upland farmers intensified their land use by increasing cropping frequency and decreasing fallow period, which led to land degradation (Forestal, 1966, Khan and Khisha, 1970, Rasul, 2003).

The process of degradation was further reinforced by resettling lowland people into CHT. Government resettled huge lowland people in CHT with a perception that CHT is thinly populated without considering the availability of arable land and limitation of use of sloping hilly lands. This triggered the process of both intensification and extensification of land-use. Lowland settlers further intensified the land-use even in hill slopes for arable crops. High valued cash crops, including vegetables and root crops are grown in the hill-slopes through extensive soil manipulation, which accelerated the soil erosion exceeding 100 t/ha (Uddin et al., 2000). Some indigenous farmers have also adopted the same intensive agriculture, while others having lost their communal land moved on to more interior areas and have continued to practice shifting cultivation on more marginal land. At the same time fallow period has been reduced further, thereby accelerating land degradation (Shoaib, 1998; Arya, 2000). The process was further reinforced by eroding traditional management system by formal laws³, which used to take care of the community land through informal village authority and anybody from outside a community could not use resources without permission from the concerned authorities. As the traditional management system has weakened, the most of the land has become open access resources (Ascoli, 1918). While the open access status of resources discouraged investment in land development and management, it encouraged the continuation of shifting cultivation as clearing a new plot of land is cheaper than making investment in land to maintain soil fertility (Khan and Khisha, 1970). This even served as discouragement to obtain the ownership of land.

Findings of the study contradict with Hardin (1968) and his followers (e.g., Ehrenfeld, 1972; Ophuls, 1973) who considered nationalization as an effective mechanism of managing common property resources. In CHT or elsewhere, where local people's customary rights were superseded for better management failed to ensure effective management and conserve those resources⁴.

Growing evidences show that tribal farmers are not conservative or reluctant to adopt improved land use system as viewed conventionally. Even in the twentieth century tribal farmers used to bring India-rubber to market as far as from a distance of nine days' journey

³ Immediately after establishing full control over CHT, the British administration took measures to reform the traditional institutions in 1892 and traditional village system based on elected village representative was replaced by the Mouza (a geographic and revenue unit having jurisdiction list) headmen (later it become hereditary) keeping the final authority of appointment to the government. This made the system weak and ineffective, as headmen had no accountability to the people; rather his loyalty was to the tribal chief and the government. Before the nationalization, the community had the responsibility to conserve resources within their jurisdiction. Although there were no well-demarcated boundaries of village area, but the boundaries of a village were generally demarcated by hill, stream, and other remarkable things, which was followed by the indigenous people. Any body outside from the village could not use any resources from that village without permission from village authorities. The village was jointly responsible for the use, management and control of the lands surrounding their village (Roy, 1996:25-28).

⁴ For example forests were nationalized in Nepal in 1957, but it accelerated the deforestation (Bromely and Chapagain, 1984; Pandit & Thapa, 2003:283). Similar experiences happened in Senegal where community-owned lands were nationalized in 1964 to protect from overgrazing, but it could not protect (Grafton, 2000).

when they found it profitable (Lewin, 1869). Tribal farmers adopted horticulture, agroforestry, tree farming and other economically and environmentally viable land use systems in different parts of CHT when they were provided with tenural rights and other necessary support services including roads and transportation (Rasul, 2003, Rasul et al., 2004). Majority of the farmers failed to adopt those superior land use system because of insecure land tenure system, complicated transit rules, formal and informal levies on agricultural commodities and inadequate marketing facilities and support services. Tenurial insecurity, as indigenous people's customary rights were denied by the state and formal land ownership was not given to them, combined with frequent displacement cultivates a feeling of insecurity which discouraged in investment in land. Tenural insecurity not only constraints such investments, but deprives farmers from formal credit, inputs and other institutional services required for improved land-use practices.

To switch from shifting cultivation to economically and environmentally suitable alternative land use systems farmers need institutional support including information, technology, credit, and marketing facilities. Provision of these services were grossly absent in the past. Presently though provision of those services have been made but failed to reach the indigenous people because of inherent biases of these services toward lowland agriculture (Arya, 2000; Rasul 2003), which has limited use in the biophysical environment of CHT. Therefore, research, extension and credit polices should be reoriented to upland agriculture based on biophysical and socio-cultural environment of CHT.

Sustainable use and management of natural resources requires participation of the people directly dependent on those resources (Wade, 1987, Messerschmidt, et al. 1993; Tepper, 1991). From its inception British colonial government considered local people as enemies of forest. This attitude is still maintained and further expanded state control, restricted local rights and adopted more stringent rules and regulations instead of mustering support from local people. Based on experience in neighboring country Nepal (Pandit and Thapa, 2003) and elsewhere, policy makers should develop appropriate mechanism to involve local people in use and management of resources. Traditional institutions, which have close relationship with local people, should be involved in managing the resources and government agencies should work together with those institutions.

To promote economically and environmentally viable land-use systems it is necessary to place appropriate policies that provide incentives and support to the land-users to in favor of locationally suitable land-use systems such as agro-forestry, tree farming, and horticulture. Such policy should include granting long-term tenural rights to land users, removal of double levies on agricultural commodities, simplifying the transit rules and strengthening support services to make tree based land use system financially more attractive to farmers. Without such policies there may be a tendency to switch from one degrading system to another degrading system such as shifting cultivation to root crops on hill slopes and to mining of resources and eventually lead to spiral of degradation as viewed by new-Malthusians. The challenge for policy makers is how to design and implement such policies and programs to promote the sustainable intensification of land-use systems in CHT and elsewhere in mountainous region.

References

- Arya, L.M., 2000. Final consultancy reports on hill agriculture. Agricultural Research Management Projects (ARMP), Bangladesh Agricultural Research Institute, Gazipur, Dhaka.
- Ascoli, F.D., 1918. Report on the Administration of the Chittagong Hill Tracts. The Bengal Secretariat Press, Calcutta.
- Bangladesh District Gazetteers, 1971. Bangladesh District Gazetteers: Chittagong Hill Tracts. Cabinet Division, Government of Bangladesh, Dhaka, Bangladesh.
- Barbier, E.B. 1999. The Economics of Land Degradation and Rural Poverty Linkages in Africa,. UNU/INRA Annual Lectures on Natural Resource Conservation and Management in Africa, November 1998, Accra, Ghana.
- Barua, B.P., 2001. Ethnicity and National Integration in Bangladesh: A study of the Chittagong Hill Tracts. Har-anand Publications Ltd., New Delhi, India.
- BBS (Bangladesh Bureau of Statistics), 2001. Agricultural Statistics. Statistics Division, Ministry of Planning, Government of Bangladesh.
- Bessaiget, P. 1958. Tribesmen of the Chittagong Hill Tracts. Asiatic society of Pakistan Publications No.1. Asiatic Society of Pakistan, Dhaka, Pakistan, 109 pp.
- BFRI, 2000. Forest Statistics of Bangladesh. Bulletin 4, Forest Economics Division, Bangladesh, Forest Research Institute, Chittagong, Bangladesh.
- Boserup, E., 1965. The conditions of agricultural growth: The economics of agrarian change under population pressure. Earthscan, London.
- Bryant, R.L., 1997. The Political Ecology of Forestry in Burma. C. Hurst & Co. Ltd., London.
- Cairns, M., 2002. Disincentives to adoption of improved fallow management synthesis of lessons from the Bogor workshop. Paper presented in a program initiation workshop on “ Farmers’ Innovations in Different Shifting Cultivation Systems of the Eastern Himalayas, held at Shillong, India, on 23-25 April 2002.
- DANIDA (Danish International Development Agency), 2000. Identification report. Watershed development project, Chittagong Hill Tracts, Bangladesh.
- FAO, 1999. State of the Worlds Forests. FAO, Rome.
- Farid, A.T.M., Hossain, S.M.M., 1988. Diagnosis of farming practices and their impact on soil resource loss and economic loss in the hill tract area of Bangladesh, Bangladesh Agricultural Research Institute, Gazipur, Bangladesh.
- Forestal (Forestal Forestry and Engineering International Ltd.), 1966. Reconnaissance soil and land-use survey, Chittagong Hill Tracts, Vancouver, Canada.
- Gafur, A., 2001. Effects of shifting cultivation on soil properties, erosion, nutrient depletion and hydrological responses in small Watershed of the Chittagong Hill Tracts of Bangladesh. Doctoral dissertation, The Royal Veterinary and Agricultural University, Copenhagen, Denmark.
- Gain, P., Moral. S., 1996. Land Rights, Land-use and Ethnic Minorities of Bangladesh. Society for Environment and Human Development (SEHD). Dhaka, Bangladesh.
- Geertz, C., 1963. Agricultural involution: the processes of ecological change in Indonesia. University of California Press, Berkeley (CA).
- Hamid, A. 1974. The challenge of shifting cultivation. Paper presented in tenth commonwealth forestry conference, held in 1974.
- Hunter, W.W., 1876. A statistical account of Bengal, Vol. VI, Chittagong Hill Tracts, Chittagong, Noakhali, Tipperah, Hill Tipperah. Tubner & Co., London, pp.106.

- Hurst, A. 2003. State forestry and spatial scale in the development discourse of post-colonial Tanzania: 1961-1971
- Huq, M.M., 2000. Government Institutions and underdevelopment: a study of the tribal people of Chittagong Hill Tracts, Bangladesh. Center for Social Studies, Dhaka University, Dhaka.
- Hutchinson, S.R.H., 1906. An account of the Chittagong Hill Tracts, The Bengal Secretariat Book Depot, Calcutta, India.
- Khan, F.K., Khisha, A.L., 1970. Shifting cultivation in East Pakistan. *The Orient. Geogra.* 14: 24-43.
- Khan, N.A., 1998. A Political Economy of Forest Resource Use: Case Studies of Social Forestry in Bangladesh. Ashgate, Aldershot, UK.
- Khisha, A.L., 1982. Parbatya Chattogram Jhum Chash: Otit, Bartaman oh Vabishat (in Bengali) [Shifting Cultivation in Chattagong Hill Tracks], *J. Tribal Res.* Vol. 1, June 1982.
- Knudsen, J.L., and Khan, N.A., 2002. An exploration of the problems and prospects of integrated watershed development in the CHT. *In: Farming Practices and Sustainable Development in the Chittagong Hill Tracts*, Khan, N.A., Alam, M.K., Khisa, S.K. and Millat-e- Mustafa M. (Eds.), CHTDB and VFFP –IC, Chittagong, Bangladesh, pp. 165-180.
- Lele, U., Stone, S., 1989. Population pressure, the environment and agricultural intensification: Variations on the Boserup hypothesis. Managing agricultural development in Africa discussion paper 4, World Bank, Washington DC.
- Lewin, T.H., 1869. The Hill Tracts of Chittagong and the Dwellers Therein, with Comparative Vocabularies of the hill dialects. Bengal printing Company Ltd., Calcutta.
- Lipton, M., 1968. The theory of the optimizing peasant, *J. Development. Stud.* 4, 327-351.
- Mohsin, A., 1997. The Politics of Nationalism: The case of Chittagong Hill Tracts, Bangladesh, The University Press Limited, Dhaka, Bangladesh.
- Niemeijer, D., 1996. The dynamics of African agricultural history: Is it time for a new development paradigm? *Develop. & Chang.* 27: 87-110.
- Rahman, M., 1998. Genesis of problems in Chittagong Hill Tracts. Paper presented in an international conference on peace and Chittagong Hill Tracts held in Dhaka, Bangladesh on 20-21 June 1998.
- Rasul, G., 2003. Factors Influencing Land-use Change in Areas With Shifting Cultivation in the Chittagong Hill Tracts of Bangladesh. Ph.D. dissertation, Asian Institute of Technology, Thailand.
- Rasul, G., Thapa, G. B., 2003. Shifting cultivation in the mountains of south and southeast Asia: Regional patterns and factors influencing the change, *Land Degrad. Develop.* 14:495-508.
- Razzaque, M.A., Roy, I., 1998. Bangladesh. Published in perspectives on sustainable farming systems in upland areas, Asian productivity organization, Tokyo.
- Regmi, M.C., 1978. Land tenure and taxation in Nepal. Ratna Pustak Bhandar, Kathmandu.
- Rerkasem K., Rerkasem B., 1994. Shifting cultivation in Thailand: its current situation and dynamics in the context of highland development. IIED forestry and land-use series No.4, International Institute for Environment and Development, 3 Endsleigh Street, London.

- Roy, R.C.K., 1996. Land rights of the indigenous peoples of the Chittagong Hill Tracts, Bangladesh. *Jumma Peoples Network in Europe (JUPNET)*, pp. 135.
- Roy, R.D., 1995. Land rights, land-use and indigenous people in the Chittagong Hill Tracts. In *Bangladesh land forest and forest people*, Society for Environment and Human Development (SEHD), Gain, P. (Ed.), Dhaka, Bangladesh, pp.53-118.
- Roy, R.D., 2002. Sustainable and equitable resource management in the Chittagong Hill Tracts. In *Farming Practices and Sustainable Development in the Chittagong Hill Tracts*, Khan, N.A., Alam, M.K., Khisa, S.K., Millat-e-Mustafa, M. (Eds.), CHTDB and VFFP –IC, Chittagong, 135 –154.
- Sanders, J.H., Shapiro, B.I., Ramaswamy, S., 1996. *The Economics of Agricultural Technology in Semiarid Sub-Saharan Africa*. The Johns Hopkins University Press, Baltimore, USA.
- Serajuddin, A.M., 1971. The Origin of the Rajas of the Chittagong Hill Tracts and their relations with the Mughals and the East India Company in the Eighteenth Century. *J. Pakistan Historical Society*, 19:52-60.
- Sfeir-younis, A., and Dragun, A. K. 1993. *Land and soil management: Technology, economics and Institutions*, Westview Press, Boulder, CO; 49-50.
- Shoaib, J.U., Mostafa, G., Rahman, M., 1998. Soil erosion hazard in Chittagong Hill Tracts: A case study. Annual report, 1998. Soil resources development Institute, Dhaka.
- Stone, G.D., 2001. Theory of square chicken: advances in agricultural intensification theory. *Asia Pacific Viewpoint*, 42:163-180.
- Thapa, G.B., 1998. Nepal's Experience in Hill Agriculture. *In: Upland farming systems in the Lao P.D.R. – Problems and opportunities for livestock*, Chapman, E.C. et al. (Eds.), Proceedings of an International workshop held in Vientiane, Laos 18-23 May, 1997 Canberra: ACIAR, 48-53.
- Thapa, G.B., Weber, K.E., 1990. Actors and Factors in Deforestation in 'Tropical Asia'. *Environ. Conservat.* 17:19-27.
- Tiffen, M. and Mortimore, M., 1994. Malthus controverted: the role of capital and technology in growth and environment recovery in Kenya. *World Development*, 22 (7): 997-1010.
- Turkelboom F., Van K.K, Ongprasert S., Sutigoolabud P., Pelletier J., 1996. *The changing landscape of the Northern Thai hills: adaptive strategies to increasing land pressure. Montane Mainland Southeast Asia in Transition*: Chiang Mai University, Thailand.
- Uddin, M.S., Islam, M.N., Sattar, M.A., 1991-92. Effect of tillage on soil erosion and yield of Mukhi Kachu in hilly region. Research Report 1991-92, Hill Agricultural research Station, Khagrachari, Chittagong Hill Tracts, Bangladesh.
- Uddin, M.S., Kamal, M.S., Mollah, M.H., 2000. *Hill Farming System and Resource Utilization in Chittagong Hill Tracts*. Hill Agricultural Research Station, Khagrachari, Bangladesh Agricultural Research Institute, 1-64.
- Uttam, S., 2000. The Destruction of Forest in the CHT and its Impact on the Environment. In: Bhaumik, S., Guhathakurta, M., and Chaudhury, S.B.R (Eds.), *Living on the Edge: Essays on the Chittagong Hill Tracts*. South Asia Forum for Human Rights, Calcutta Research Group, Wave-o-Print Pvt. Ltd. Calcutta, India.

