Academic Journal of Plant Sciences 3 (1): 11-18, 2010
ISSN 1995-8986

Sustainable Forest Management for Poverty Reduction Through Agroforestry Options: Lesson from the Remote Uplands of Eastern Bangladesh

[1]S.A. Rahman, [2]K.M. Farhana, [3]A. Imtiaj, [4]S.W. Wachira, [3]M.A. Rahman and [1]S. Saha

[1]Department of Sociology, University of Rajshahi, Rajshahi 6205, Bangladesh
[2]Institute of Bangladesh Studies (IBS), University of Rajshahi, Bangladesh
[3]Department of Botany, University of Rajshahi, Bangladesh
[4]Organization Chairperson, Mount Kenya Youth Initiative for Ecosystem Restoration, P.O Box 52136- 00200, Nairobi, Kenya

Abstract: In Bangladesh, the massive growth rate of population has intensified pressure on forest resources throughout the country. The forest coverage of Bangladesh is one of the lowest and the deforestation rate is the highest of any country in the world. In the Hill Tracts area of Eastern Bangladesh, a drastic reduction in the recycling period for slash-and-burn cultivation due to high population growth is contributing to deforestation. Coupled with the process of deforestation, flawed afforestration programmes have seriously exposed Bangladesh to environmental vulnerability. In spite of many policy and project efforts, the afforestration process are still lingers at a low level, overall. Agroforestry is a promising alternative. Project experiences and research, have shown that agroforestry, presents one of the very few options that can protect and sustainably manage the degrading forest resources. It is endorsed by the people themselves and can have good economic returns and may lift the upland farmers out of the poverty trap.

Key words: Population growth · Deforestation · Poverty · Agroforestry · Forest management

INTRODUCTION

Forests and other natural resources are crucial to the livelihoods of millions of poor people worldwide. According to the World Bank, over 90 per cent of the 1.2 billion people living in extreme poverty depend on forests for many parts of their livelihoods. Eradicating poverty is therefore impossible without paying specific attention to the 410 million people (including 60 million indigenous people) who live in or near tropical forest areas and depend on these forests for their subsistence and survival needs [1]. Of particular importance in this respect this paper implies the potentiality of forest based poverty reduction strategies in Bangladesh by evaluating some implemented projects. Because, peoples of Bangladesh are suffering from extreme poverty[1] and the nation still trying to break the poverty trap with various plans and programs. Forest based poverty reduction is one of the significant parts of these plans and programs. Since, forest plays an important role for poverty reduction in Bangladesh, it provides goods (food, fodder, fuel, medicines, constriction materials), income (sale of NTFP) and employment, which significantly contributes to the livelihoods of poor people in meeting different types of expenses and needs, thus they are able to reduce poverty. Forest is also important and effective for conserving and managing bio-diversity.

But the massive growth rate of population[2] has intensified pressure on forest resources throughout the country. Forests are depleted by commercial timber exploitation and gradually converted into pastures, plantations and cultivated fields. At present only

Corresponding Author: S.A. Rahman, Department of Sociology, University of Rajshahi, Rajshahi 6205, Bangladesh

Special Note: Authors are shocked and saddened by the death of one of our authors S. SAHA, a young promising academician and researcher dead in Malaysia. He passing marks not only the savage, untimely end of a wonderful person with so much to live for. It also marks the loss of a scientist dedicated to humanity and passionate about improving the lives of the people through his works. May his soul rest in peace.

[1]In Southeast Asia, Bangladesh is one of the poorest countries. The most recent estimates of extreme poverty, 36.0 percent of the country's population lives under the extreme poverty line compared to 5.6, 17.0 and 34.7 percent for Sri Lanka, Pakistan and India respectively (UNDP, 2006).
[2]With an annual growth rate of 1.8 percent, the total population of Bangladesh may increase from 144.46 million in mid 2006 to 193.75 million in 2025 (ESCAP, 2006).

6.7 percent of the country's surface area was left under forest, with a net forest change rate estimated at -0.3 percent, i.e., –2,000 hectares per year, for the period 2000-2005 [2]. In the particular case of Eastern Bangladesh the traditional system of shifting cultivation, still the major agricultural system in this area, is the main cause of drastic deforestation. Due to the loss of forest resources, rural communities turn to alternative fuels such as cow dung and crop residues that previously served as manure on agricultural fields, which results in more soil degradation, lower yields and poverty. Considering above situation, agroforestry is seen as one of the very few options that can protect degrading forest resources and may lift the farmers out of the poverty trap by providing quite good economic rates of return and local added value and hence reduce poverty [3-5].

Historical Trends in Thinking about Forests and Poverty: Even in the late 1960s it was recognized that many tropical forest areas are characterized by poor socioeconomic conditions and poverty. Indeed, throughout the world, socio-economic development often started with the conversion of forests into land-use systems that were expected to be financially more lucrative. In the late 1950s and early 1960s it was assumed that investments in tropical forestry in the form of industrial timber production would generate development that would automatically 'trickle down' to the poor in tropical forest areas. At the end of the 1960s it was acknowledged that this approach was failing to deliver the expected socio-economic development.

Consequently, during the 1970s and 1980s and especially since the FAO VIIIth Forestry Congress held in 1978 under the title 'Forestry for People', the focus of (inter)national forestry development strategies gradually changed from the need for increased commercial production to the need for a fairer distribution of profits from forest products, the need to consider forest products for basic needs and the need for active local participation in forest management. Since that time, there has been a considerable increase in the understanding of the role of forests in the livelihoods of poor people and of the options available for organising forest management in such a manner that it contributes to rural development.

As a result of the Rio de Janeiro Conference on Environment and Development in 1992, the focus of international policies shifted during the 1990s to the need to prevent deforestation and loss of biodiversity. Since the formulation of the Millennium Development Goals in 2000 and the Johannesburg Conference on Environment and Development in 2002, there has been a greater and more unified focus on how to link environmental conservation and poverty alleviation.

The Forestry Sector in Bangladesh

The State of Forestry and its Role: Forestry sector contributes only 3 percent to the nation's Gross Domestic Product (GDP), which is insignificant in highlighting the real importance of the sectors. The country's major source of energy and rural house and furniture construction materials are still the outproduct of forest department. Forests also play the vital role of protecting the watersheds, irrigation structure, coastal areas and above all, the environment itself.

The forests on state lands have been subjected to organized illicit commercial logging, unplanned and abrupt conversion to agriculture and other nonforestry uses, fire, grazing and other anthropogenic influences. Northwest Bangladesh has only about 2 percent tree cover. In 1980s, the rate of forest destruction was 8,000 hectares per annum and the annual deforestation rate is estimated to be 3.3 percent. Consequently, per capita forestland has declined from 0.035 ha in 1969 to 0.006 ha in 2006 [2,6].

The impact and manifestation of such alarming rate of deforestation are multifaceted. Deforestation causes decrease in water-holding capacity, increased soil erosion and loss of habitat and biodiversity. The cost of these impacts on the economy was estimated to be 1 percent of GDP in 1990 [6]. Decrease in timber and other forest products incur direct economic loss. People living in the rural and hilly areas who depend on forest for subsistence are affected. Many of the plants and animals e.g., rhinos, bisons, pinkheaded wood ducks have slowly disappeared.

The Forest Department (FD), as an integral part of the Ministry of Environment and Forest (MOEF formed in 1989), administers the country's forest resources and manages the public forest lands. But, slow pace of institutional reform and bureaucratic reorientation, shortage of technical and skilled staff, poor enforcement of policies and programs and weak environment monitoring are considered to be the major constraints of this department.

The ever-increasing population of Bangladesh is exerting pressure on existing forests for more food, fuelwood, timber, fodder and other forest products and is resulting in the overexploitation of government-managed forest resources. Other forest lands are also degraded and as a result, their productivity is unacceptably low. The productivity of mangrove forest has already declined

by 25 percent over a period of 25 years. Similarly, the yield of hill forests has declined at the same rate. Present productivity of forests has declined to a range of 1.5-2.5 m^3 per hectare per annum from 7-8 m^3 20 years ago.

The recuperative capacity of the natural growth of plants has failed to keep pace with the increasing level of demand. The rate of forest resources depletion is much faster than that of the contemporary attempts in afforestation and the rehabilitation of denuded resource base. This dismal forestry situation of the country is further exacerbated by the uneven spatial distribution of the existing government forest areas. Almost 48 percent of the government forests are located in the eastern region of the country along the international frontiers (hill forests). Another 23 percent is on the southwestern corner along the Bay of Bengal (mangrove forests). The vast flat countryside where almost the whole population live has only 0.12 million ha of plain land Sal forests. Out of the 64 Districts of the country, 28 Districts have no public forest at all [7]. While major portions of the natural hill forests are inaccessible and, hence, either underutilized or unutilized, the accessible forests have been overutilized or denuded and in parts encroached. Furthermore, there is very little scope to expand forest areas horizontally.

In view of the above problems, limitations and challenges of the Bangladesh forestry sector, community-based participatory afforestation practices (agroforestry), commonly called as Social Forestry (SF), have been increasingly felt to be the most feasible strategy for the long-term sustainability of the forests [8,9]. Experts suggest that there is significant scope for vertical expansion of forests through multiple forestry practices. It is estimated that some 1.51 million ha (or 10.4 percent of the total land area) of marginal and fallow land can potentially be made available and brought under forestry and environmental improvement projects through participatory forestry programs facilitated by the government and NGOs. Such programs may also make a judicious use of the disadvantaged sections of country's human resources including 48 percent women and nearly 10 million educated unemployed youth.

Forest Policies in Bangladesh: The first forest policy in the independent Bangladesh was announced in 1979. This was "a two-page manifesto-type statement" with obscure and "generalized directions", "mostly focusing on the forest department" [20] (5 and 18). Its suggestions included "horizontal expansion of the forest area" under the government, which was to be "carefully preserved and scientifically managed" by a (centralized) "cadre of forest officers"; "setting up new forest-based industries"; "optimum extraction forest produce"; and protection of forests from the (so-called) "encroachers". Rural forestry and local people received no major attention, except in the form of a vague call for a "mass motivational drive for tree planting" [10]; and was hardly adequate for addressing the current needs and crises of the forestry sector [11].

The current National Forest Policy 1994 marks a major departure from the manifestly commercial considerations of the earlier policies. A careful examination of the policy can reveal the following major features:

- It has a commitment to sustainable development ('meeting the basic needs of the present and future generations').
- Here forestry is seen within the broader framework of integrated rural development and poverty alleviation.
- It shows a commitment to contribute to the improvement of the global and regional environmental concerns such as 'global warming, desertification and control of trade and commerce of wild animals'.
- It seeks 'participation of local people' in forest protection especially in curbing 'illegal occupation of forest lands, illegal tree felling and hunting of wild animal'.
- It also pledges governmental support and encouragement for all forms of public and private afforestation programs, especially in the rural homesteads and institutional premises.

Despite the above positive features, however, the policy still has a number of limitations:

- Although it vaguely commits to 'extend the scope of poverty alleviation and forest-based rural development,' it does not say anything about the how it can actually be achieved.
- The (well-known) social variables (e.g., land ownership, patronage, social stratification), which impact on forestry, have not been addressed in the policy.
- Except such rhetorical calls for 'participation of local people in forest protection', or 'increased participation of women in the homestead and farm-based forestry', the policy hardly offers any avenue for the involvement of the forest-based and relatively marginalized section of rural communities, in the day-to-day management and operation of forestry programs.

- The role of the civil society and third-sector organizations (e.g., NGOs, CBOs, interest groups) in forestry development and the nature of functional relationship between these organizations and the governmental agencies have not been made clear in the policy.
- The policy promises to 'strengthen the forest department', but remains silent about the crucial institutional reforms and capacity-building issues concerning the government agencies.
- It does not propose any specially tailored and targeted forestry interventions for the most vulnerable sections of rural communities (e.g., destitute women, children and landless poor).

Agroforestry as an Alternative Option for Sustainable Forest Management: Agroforestry is considered as one of the major strategies for sustainable forest management as well as poverty reduction in Bangladesh, where there is obvious priority for food crop production. Research [4] has indicated that agroforestry may not only be an optimal solution for afforestration, species diversity conservation [5] and the sustainability of the environment, but may also have quite good economic rates of return. The agroforestry project not only helps to increase food and fodder but also protects the existing forest where unemployed and poor people rush to earn their livelihoods. Now agroforestry has earned a distinct identity as an approach to sustainable land use. Agroforestry helps to lift rural poor from poverty through market driven, locally led tree cultivation systems that generate income and build assets; conserve biodiversity through integrated conservation-development solutions based on agroforestry technologies. Further it can protect forest through agroforestry based solutions; assist the rural poor to better adapt to change and to benefit from emerging carbon markets, through tree cultivation.

Evidence from Upland Settlement Project (USP)

Project History and Profile: The Upland Settlement Project (USP), a community-focused land management and agroforestry project, is located in the Chittagong Hill Tracts (CHT) region of Bangladesh. The project attempts to 'rehabilitate and develop' some impoverished ethnic farmers through the promotion of an agroforestry 'model'. These farmers have hitherto been engaged in *jum* (shifting cultivation). In recent years, shifting cultivation has largely been failing to support the farmers' livelihood for such reasons as the rapid population growth, scant and degraded (soil and forest) resource base, short rotational cycle of production and the changing demands and lifestyle. A number of 'rehabilitation' schemes have been tried and tested in CHT with a view to encourage the *jumias* (shifting cultivators) to a permanent mode of livelihood, ameliorate their living standard and also to compensate for the loss they suffered through dislocations and displacements Khan and Khisa [12] provides a brief overview of the major settlement and rehabilitation schemes, prior to USP).

In line with the previous attempts in resettlement of the ethnic communities in CHT, USP was originally conceived in 1979 under the purview of the government's premier agency charged with the development of CHT, known as the Chittagong Hill Tracts Development Board (CHTDB). The project became fully operational in 1985 and it 'resettled' some 2,000 ethnic families in a number of purposively-developed agroforestry plots. As a sequel to the first phase of the USP, the current (second) phase started in 1994, involving 1,000 landless and marginal *jhumia* families who have been resettled in 20 purposely-developed 'project villages' in the districts of Khagrachari and Bandarban. Each village accommodates 50 households (HH). The families represent four major ethnic communities in CHT, namely, the Marma (431), the Tripura (382), the Tanchangya (151) and the Chakma (36). The stated goals of the project include the following:

- Organized settlement of ethnic shifting cultivators in the upland areas of Khagrachari and Bandarban districts in CHT;
- Development of the marginal and degraded upland areas (which currently remains fallow, underutilized or unsustainably exploited) through integrated and intensive agroforestry activities, including rubber plantations;
- Promotion of long-term socioeconomic uplifting and empowerment of the targeted families;
- Enhancement of local community participation in the development activities;
- Securing, widening and sustaining a source of livelihood for the participating ethnic communities; and
- Improvement of the local environment, especially in the forms of reducing the rate of soil erosion and deforestation and increasing the tree coverage in the area.

Six villages, namely Wasu 1 and 2, Bailyachari 1 and 2 and Taimatai 1 and 2, have been covered during the fieldwork. The agroforestry model, which USP attempts to promote and disseminate, is known as the Contour Hedgerow Intercropping Agroforestry

Table 1: Land Used in the Agroforestry Plots

	Slope category (%)			
Up to 5%	5-15%	15-30%	30-60%	Above 60%
Level to gently sloping	Sloping	Moderate steep	Steep	Very steep
Upland rice	Upland rice	Upland rice	Upland rice	Upland rice
Vegetable	Vegetable	Banana	Banana	Banana
Ginger Turmeric	Ginger Turmeric	Litchis	Litchis	Forest species
Banana	Banana	Jackfruit	Jackfruit	(especially
Pineapple	Pineapple	Pineapple	Pineapple	*Gmelina arborea,*
Lemon	Lemon	Mango	Bamboo	*Tectona grandis,*
Guava	Guava	Amra		*Acacia spp.,*
Papaya	Papaya	Bel		*Cassia spp.,*
Custard apple	Custard apple	Areca nut		*Leucaena spp.*)
Areca nut	Areca nut			Bamboo

Technology (CHIAT) (for a fuller description of CHT and the context of development of CHIAT in the region, see respectively Khan and Khisa [12]. CHIAT has been widely promoted in many parts of Asia to minimize erosion, restore soil fertility and reduce poverty. Along the same vein, there has been great enthusiasm for CHIAT in Bangladesh and USP has a mandate to popularize CHIAT and associated technologies in the locality.

Each participating *jhumia* (shifting cultivator) family has been allotted a total of 2.12 ha of land, out of which 0.5 ha is intended for homestead and agroforestry activities and 1.6 ha for raising rubber (intercropped with banana) plantation. The following table (Table 1) depicts the common land use pattern in the study area.

Rubber is planted in a 'block' of 81 ha, managed by a 'project village', generally consisting of 50 *jhumia* families (i.e., 1.6 ha x 50 = 81 ha). The rubber 'blocks' are adjacent to the villages. A total area under rubber plantation is 1,619 ha. Rubber is planted in contour terraces; banana (or occasionally, pineapple) is planted in the interrows with a view to maximize land utilization, reduce weed growth and generate additional income.

Summary of Lessons: The provision of health, nutrition and sanitary facilities has led to better health care for the participating families. The primary schools provided by USP, has also contributed to raise the general level of literacy among the farmers' children. The project has contributed to the increased status and recognition of the farmers by providing them with the ownership of the land and by augmenting their income level. Collective activities seem to have intensified as an effect of the project. The project farmers have emerged as a 'power group' in the local government elections and, therefore, have received increased attention from the local political leadership.

The majority of farmers (84 percent) reported to have cherished a sense of recognition and esteem by their peers and villagers (outside the project territory), which is manifested by such incidents as more visits by relatives,

- Invitation to socioreligious events,
- Marriage connections to well-off families and
- Wider access to public offices and other formal quarters.

Collective activities seem to have intensified as an effect of the project. A total of 20 'village committees' have been formed to carry out the farmers' day-to-day affairs. It has been observed during the course of the fieldwork that the project farmers have emerged as a 'power group' in the local government elections and, therefore, have received increased attention from the local political leadership. Of late, 15 farmers have been elected Members in the Unions (an important tier of the local government system at the subnational level).

Patron-client relations between farmers and the local elite are manifested in such occasions as accessing political power; securing loan and assistance from informal money lenders and accessing the formal sectors.

Patronage relations and influences are manifest in the study area. Some examples include:

- Some farmers maintain regular contact with *matobbar* or *karbari* (local elite/leaders) to access and exploit political power.

- Farmers are selected for inclusion in the project by a specialized committee, consisting of representatives from the local government offices and indigenous rural institutions (e.g., the 'tribal headman'). For example, Krishna Mahan, a farmer in Byllacari was brought to the project by a local elite for whom he used to work before: "[I] worked in his [the patron's] grocery shop...He [referred me] to some of the 'big people' in the project and [accordingly] I came here and got this land...I do not know much about any committee or any meeting;... if there is a problem, I go to him."
- Informal loans and assistance from *mohajons* (local money lenders) require collateral in the form of a 'social reference' from the local elite.

Women play a most active role in the management of household and agroforestry activities, they have insignificant control over the resources (and the benefits accruing thereof). In the absence of an effective gender policy, the overall working environment for the female staff is not very conducive. The level of female participation in the project management is insignificant. The project has, however, contributed significantly towards increasing the social status of women both at the family and organizational levels. The limited income which they earn by participating in the project activities seems toinstill a sense of self-esteem among the women. They also reported that they currently enjoy relatively more social status as a result of participation in the project. To the respondents, the manifestations of 'increased social status' are:

- "we can now visit the government offices";
- "our husbands ask for our opinion in important family affairs" ;
- "the [project] office has opened a big file in my name";
- "nowadays more of our rich relatives visit our homes" ;
- "big [high ranking] officials talk to us"; and
- "...have some money at home most of the month".

As compared to their earlier predicament, farmers' income has increased after joining the project. The project also shows positive impact on expansion of greenery and soil conservation. It has strong influence on the working dynamics of the principal forces of deforestation in the locality. The farmers seem to be aware and conscious about the nature and causes of resource depletion in the locality.

Evidence from The Betagi and Pomora Social Forestry Project

Project History and Profile: The Betagi and Pomora Social Forestry (SF) projects are located respectively in Betagi and Pomora *Mouzas* (revenue-villages) in Rangunia *Thana*, about 25 km northeast of Chittagong City in eastern Bangladesh. The total area under the Betagi project is 190 ha of *Khas* land (state land under the Ministry of Land). The Pomora project constitutes 276 ha of protected forest land (under purview of FD) and 24 ha *Khas* land.

The Betagi and Pomora projects were launched in 1979 and 1980 respectively. The historical background and general description of the projects are also widely covered by Rahman [13], Alim [14] and Quddus *et al.* [15].

Before 1950, this area was densely forested. Since the 1950s, there had been a prolific growth of commercial logging by an alliance among the local elite, urban timber traders and a section of government and local government officials. By the early 1970s, the once dense forests of the locality were reduced to, at best, patches of "scattered bushes" [13] and at worst, completely barren, wide, open lands [14]. The deforestation had profound ecological consequences as well. It caused massive soil erosion and degradation both in forest and agricultural lands and contributed to the reduction of agricultural production in the locality [16].

Against this backdrop, some renowned intellectuals, senior government officials and local philanthropists envisaged a community-based forestry program for the region with an aim to "rehabilitate the denuded hills with productive trees and the landless with subsistence economy" [17]. Some landless families were selected from the adjoining villages and were rehabilitated in the SF projects. Each family (farming household) was allotted 4 acres (1.62 ha) of land on annual renewal basis. In 1987, they were accorded permanent ownership of land.

Currently, 82 and 152 households are participating in Betagi and Pomora respectively. The projects are managed at two corresponding levels. At the *Thana* level, there is a *Thana Selection Committee*, consisting of representatives from government departments and local government offices. The committee performs coordinating and advisory roles, including the selection of farmers, periodic monitoring of performance and discussion of problems concerning the projects. At the village level, day-to-day activities of the projects are run by two farmers' cooperatives called the *Bhumiheen Samities* (the landless farmers' associations). The s*amities* arrange meeting to discuss farmers' problems, resolve conflicts

among their members and liaise with the *Thana Committee* and other concerned agencies. The s*amity* leaders are elected by the farmers and have to work under the general guidance of the *Thana* committee.

Summary of Lessons: There has been a clear amelioration of farmers' quality and standard of living after joining the projects. From a state of dire poverty, they have reached a point where they can spend on nutritious food, clothing and medicine, which were well beyond their means prior to the projects. Drawing on data gathered from 15 farmers from Betagi and 15 farmers from Pomora, the average annual income is calculated to be Tk53,200 (US$ 818.46) and Tk34,280 (US$ 527.38) respectively.

About one-third of the farmers in Betagi and Pomora received training on basic readingwriting skills and agroforestry activities during the initial years of the project. In the absence of periodic back-up and monitoring, however, the impact of training has been limited. Farmers' literacy rate has increased. A few NGOs operate in the study area with the aim of increasing the general level of awareness regarding health, sanitation, literacy and family planning among the farmers. In Pomora and Betagi respectively, according to s*amity* chairmen, approximately 17 percent and 21 percent use contraceptives (mainly condoms). Farmers demonstrate reasonably elaborate knowledge on homegardens, horticultural species and their uses. Patronage relations are deeply ingrained in the social fabric of the study areas. They have profound implications for forestry resource-use in general and the achievements of SF in particular.

CONCLUSIONS

Community-focused forest management through agroforestry is a viable strategy and mechanism for poverty reduction. It is a more objective and meaningful assessment of forestry project(s)' performance and contribution. This calls for systematic social and ethnographic inputs to sustainable forest management. Alongside the direct benefits (e.g., income), farmers also receive considerable indirect benefits (e.g., social credibility) from agroforestry. Thus the mechanism and arrangements of benefits distribution need to be address at the central policy level, preferably in the early days of project operation. Practically-oriented and problem-solving research is increasingly needed to inform the concerned quarters about exploring ways of improving forestry as a means of development.

REFERENCES

1. World Bank, 2004. Sustaining Forests: A Development Strategy. The World Bank, Washington D.C.
2. FAO 2006. Global Forest Resources Assessment 2005 – Progress Towards Sustainable Forest Management. Rome, Italy.
3. Rahman S.A. 2006. Development Impacts of Agroforestry on Rural Households. M.Phil Dissertation, University of Rajshahi, Bangladesh.
4. Rahman, A. and S.S. Islam, 1997. Financial viability of agroforestry under participatory approach in Bangladesh: the case of forest department's first logged over plots of Dinajpur. Bangladesh Journal of Forest Science, 26(1): 47-55.
5. Alam, M.K., M. Mohiuddin and S.R. Basak, 1996. Village trees of Bangladesh: diversity and economic aspects, Bangladesh Journal of Forest Science, 25(1&2): 21-36.
6. Bangladesh Bureau of Statistics (BBS). 1999. Statistical Year Book of Bangladesh. Ministry of Planning, Dhaka.
7. FAO (Food and Agriculture Organization of the United Nations) 2000. Forest Resources of Bangladesh,Country Report. Working Paper 15. Rome, Italy.
8. Millat-e-Mustafa M., J.B. Hall and Z. Teklehaimanot, 2000. Indigenous Management Techniques of Bangladesh Homegardens. International Tree Crop Journal, 10(3): 215-228.
9. Khan, N.A., 1998. A political Economy of Forest Resource Use: Case Studies of Social Forestry in Bangladesh. Ashgate Publishing Company, England.
10. Roy, M.K., 1987. Forest Sector Planning and Development in Bangladesh. Master of Forestry dissertation, Department of Forestry, Australian National University, Canberra.
11. Task Force, 1991. Report of the Task Forces on Bangladesh Development Strategies for the 1990s Environment Policy. University Press Limited, Dhaka.
12. Khan, N.A. and Khisa, 2000. Sustainable land management with rubber-based agroforestry: a Bangladeshi example of upland community development. Sustainable Development, 8(1): 1- 10.
13. Rahman, A., 1992. Participatory Approach to Forest Resource Management in Bangladesh: Some Major Initiatives and Lessons Learned. Paper prepared for International Seminar on Forest Administration and Management, Michigan School of Natural Resources, Michigan.

14. Alim, A., 1988. Forestry With The People and For The People. Institute of Forestry, Chittagong, Bangladesh.
15. Quddus, A.H.G., S.M.I. Ali, A.M.A. Bhuiyan and M. Hossain, 1992. Greening the Hills: the Betagi-Pomora Agroforestry Experience. Bangladesh Agricultural Research Council and Winrock International, Dhaka.
16. Bhuiyan, A.A., 1994. Forestland Agroforestry: The North Bengal Experience. BARC–Winrock International Agroforestry and Participatory Forestry Research and Training Support Program, Dhaka.
17. Ahmed, A.U. and A.K. Azad, 1987. Social Forestry in Bangladesh: A Case Study of Betagi and Pomora Experiments. University of Chittagong, Bangladesh.
18. United Nations Development Programme (UNDP) 2006, Human Development Report 2006. Oxford University Press, New York. pp: 292-293.
19. ESCAP (Economic and Social Commission for Asia and the Pacific) 2006. 2006 ESCAP Population Data Sheet. Unite Nations, New York.
20. Anonymous. Undated. Forest Policy of Bangladesh: Seeking for New Directions. B.Sc. (Honours) Review Paper 179. Institute of Forestry, Chittagong, Bangladesh.