

**PEOPLE'S PREFERENCE, PARTICIPATION AND PERCEPTION TOWARDS COMMUNITY FORESTRY WOODLOT (CFW): A CASE OF COMMUNITY FORESTRY PROJECT IN DHAKA FOREST DIVISION, BANGLADESH**

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**Abstract:** Community Forestry as any situation intimately involves local people in a forestry activity has widely been practiced in Bangladesh. The concepts embrace a range of situation, establishing woodlot which are short of wood and other forests products for local needs is one of them excluding large-scale industrial forestry. The study describes the social factors, which can broadly influence the process of CFW due to the differences in socio-economic setting from one social group to another even within the same biophysical settings. Data were collected from the people living in the vicinity of the Dhaka Forest Division, Bangladesh. Affiliation of social parameters only reveals the traditional method of prioritization on forest resources use by the local people and their preferences such as location, forest resources, species etc.; participation such as forest conservation and management activities and perception such as household forest resources needs. The most efficient outcome of this study is the invitation to revise the currently adopted methods in selecting suitable species and sites for CFW programme taking social parameters into consideration along with the existing biophysical setting.

**Keywords:** Community Forestry; Woodlot; Preference index; Participation index; and Satisfaction Index.

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## **Introduction**

Forests of central Bangladesh decreased dramatically during the last 30 years due to large-scale conversion of forestlands to non-forest uses and heavy commercial logging of trees. Once, heavy dense sal forest in the central Bangladesh, now void of forest vegetation. In the ancient as well as recent past Worldwide Government Agencies almost exclusively relied on custodial forest management strategies based on centralized control by technical experts who emphasized large-scale timber production and other industrial commercial activities. Officially designated reserves were "protected" by legislation and guards aimed at limiting forest access by local people (who were looked upon by state foresters as "the enemy"). The State as "Partner" in community forestry, such agencies has increasingly perceived the need to seek local people's participation in the sustainable management and conservation of forests and forest resources. "Last two decades have been marked by the widespread rise in community or social forestry approaches based on a local-state partnership" (FAO, 1978; Arnold, 1992; Poffenberger et al, 1997).

Community forestry is the control and management of forest resources by the rural people who use those especially for household purposes and as an integral part of their farming systems (Gilmour and Fisher, 1997). Woodlot is simply the deliberate growing and tending of fast growing tree species on state owned land as the scale indicated by the local demand for forest produce, normally fuel wood and in some instances poles, posts, small wood (timber) for local consumption and cottage industries (GOB, 1992). CFW plantation has been practicing in Dhaka Forest Division as a forest conservation and management initiative since 1970s (Ahmed and Johan, 2001) where local people's participation was not the center point (Khan and Begum, 1997) of consideration at the very beginning as today. Participation of local people in the management of forest resources seems to be a promising way to conserve remaining forest areas.

Increasing population pressure (Ahamed, 1998; Khan, 1998), rapid agricultural development (Salam et al, 2000), poverty, landlessness and unemployment (Akhter and Sarker, 1998; Lai and Jarvis, 1991) compelled the poor forest villagers to encroach and degrade the natural Sal forest as elsewhere around the world (Armesto et al, 2001). Due to this problem and existing socioeconomic setting conservation of forests and rehabilitation of encroached or degraded areas through unilateral efforts by the Forest Department is not possible as in India (Onibon et al, 2000). Thus, local people need to be involved in forest conservation and management activities (Gurses et al, 2001; Hildyard et al, 2001; Soto et al, 2001; Straede and Helles, 2000; Hyttinen et al, 1999; Imam, 1991). This is because of their legal rights (Ekta Parishad et al, 2002; Wolvekamp, 1999; Vermeulen et al, 1998), obligations to decentralized participation (Hegde, 2000) and in deciding on partnership activities (Gardner et al, 2001; Rhee, 2000; Stieglitz, 2000). This will guarantee a forest management system that is economically viable (Rice, 2001; Sharma, 2000; Trejo and Mejia, 1995), socially adaptable (Montagu, 2001; Rahim et al, 1995) and ecologically sustainable (Suharti et al, 2001; Warner, 2000; Gupta and Paliwal, 1998). This will help enhancing mutual learning (Donahue, 2000; Grundy et al, 2000), reduce conflict (Wollenberg et al, 2001; Borge, 2000; Fisher et al, 1999), transparent decision

making (Mather, 2000; Novellino, 2000; Yang et al, 2000), provision of income generation and capacity building (Verma, 2000; Rahman, 1995) among the local people.

There might be significant impacts of local people's preference, participation and perception in selecting species for such woodlot plantation. There is no such scientific study in this endeavor, which inspired us to investigate that how local people's preference, participation and perception could influence the choice of species and area for further woodlot establishment. The objectives of our study were to investigate the local people's 1) preferences such as location, land types, forest resources, species, distance; 2) participation such as forest conservation and management activities, willingness to participate in such activities and 3) perception such as household forest resources needs, satisfaction on the supply of such resources from community forestry woodlot.

### **Study area**

*Selection:* There had been a commercial logging of big trees for railway sleeper production and house buildings in the central sal forest since 1950s. It was also subject to large-scale conversion to agricultural lands by the people living in and around the forest. The idea of conserving the forest dated back 30 years when there were hardly any forest remaining in this area. Bangladesh Forest Department started to realize the danger of deforestation and conversion of forestlands to non-forest uses. A process of convincing villagers of the importance of forest protection began. The structure of the 'self defence village' with its various committees supported the forest protection. CFW plantation has been practicing in the central sal forest as a forest conservation and management initiative since 1970s (Ahmed and Johan, 2001) where community participation was the center point (Khan and Begum, 1997) of consideration for the selection of species and area of plantation. Dhaka Forest Division is one of most important Forest Divisions in Bangladesh under community forestry woodlot programme inspired us to select this area to investigate our study objectives.

*Location and climate:* Dhaka Forest Division is one of the 16 Forest Divisions in the Forestry Sector Project of the country with an area of 1,74,153 ha of which 26,311 ha is forest (Forestry Sector Study, 1996). It is surrounded by Mymensing district in the North, Narasingdi district in the East, Dhaka and Narayanganj district in the South and Tangail district in the West. It lies in a tropical climate (20°53' and 24°20' N and 90°10' and 90°35' E) with three marked seasons are rainy (mean annual rainfall 2140 mm), summer (maximum average temperature 25.4° C to 33.9° C) and winter (minimum average temperature 12.8° C to 14.3° C) (Bangladesh Meteorological Department, 2001).

*Demography and land use:* It is located in the densely populated (1,489 person/sq.mile) central part of the country with a total population of 68, 211 (52.87% male and 47.13% female). Population is increasing at a rate of 1.10% since 1974 (Statistical Year Book of Bangladesh, 2002). The mean family size is 5.09 with an average literacy rate of 36.61% (43.16% male and 29.35% female). The mean annual income of 225 US\$ (300 US\$ for male and 150 US\$ for female) (Forestry Sector Study, 1996) is found in the study area. Around 63%, whereas national average is 55% (Chowdhury and Hussain, 1988) households in this area are landless who have been living on encroached public forestlands resulting land tenural conflict with government (Forestry Sector Study, 1996). Agriculture is the major land use system in this area.

### **Methods**

*Sampling design:* Data were collected from the households of four forest ranges (Sreepur, Kaliakoir, Rajendrapur and Kachighata) of Dhaka Forest Division where CFW programme has widely been practicing. A total of 200 (20% of the total households) households (50 from each forest range i.e., 25 are participating and 25 are not participating in the CFW programme) were randomly selected as sample for primary data collection. Total of 100 key informants (25 from each forest range) and 40 informal groups of 5 – 10 persons in each group (10 from each forest range) were randomly selected for interview. Random table was employed for selecting samples randomly.

*Data collation:* Structured interview was conducted among randomly selected households in the village tracts. Preferably the household's head was interviewed with a structured "Household Interview Questionnaire" containing information on population structures, socioeconomic structures, degree of dependency and type of forest resources use from the sal forest before and after the community forestry woodlot had established. This survey questionnaire also was containing information on the people's preferences on the location (across sites), land types (across land forms), forest resources (across products and services), species (across types) and distances (from households to woodlot plantation). Information on the people's participation attitude and willingness in forest conservation and management activities through woodlot plantation was also extracted from this questionnaire. Information on households forest resources

need, Forest Department's cooperation in the process of woodlot plantation to the community was collected using the same survey questionnaire.

Key informants such as elderly, schoolteachers, local political leaders, businessmen and village authorities from every forest ranges were selected to obtain more in-depth information about forest resources use and their species preference for woodlot plantation. Informal interview was done among the groups of local people on due investigation of the forest resources use from woodlot plantation, species preferences, their perception towards woodlot plantation in order to complement the information provided by the households' heads and key informants.

*Data Analysis:* Qualitative data were categorized according to two population groups interviewed and analyzed mainly based on descriptive statistical analysis using Statistical Packages for Social Science (SPSS 9.1) and Microsoft Excel. Data were compared through cross tabulation, simple frequency distribution, case summaries, report, multiple response table, multiple frequency table, graphical extrapolation etc. Following indices were employed for testing respondents' priority, participation and satisfaction level in the CFW programme.

*Priority or preference index:* In priority or preference index, the respondents' degree of affection was computed to a statement related to priority or preferences of something. Points of equal interval such as 1.00, 0.80, 0.60, ..... against priority rank respectively of 1, 2, 3, ..... were employed to test highest (1.00) or first priority to lowest (0.00) or no priority. Priority or preference level was computed by applying the following formula

$$I = \frac{\sum S_i F_i}{N} \quad (\text{Miah, 1993})$$

Where: I = Priority index such that (0 ≤ I ≤ 1); S<sub>i</sub> = Scale value at the i<sup>th</sup> priority; F<sub>i</sub> = Frequency of i<sup>th</sup> priority; N = Total number of observation

*Performance and participation index:* In this index, respondents' degree of involvement was computed to a statement related to their participation to forest conservation and management activities. Points of equal interval i.e., 0.00, 0.50 and 1.00 were employed respectively for 'Never', 'Sometimes' and 'Always' participation. Participation level was computed by applying the following formula

$$I = \frac{0 \times f_n + 0.5 \times f_s + 1 \times f_a}{N} \quad (\text{Miah, 1993})$$

Where, I = Participation index such that 0 ≤ I ≤ 1, f<sub>n</sub> = Frequency of respondents, indicating no participation, f<sub>s</sub> = Frequency of respondents indicating sometimes, f<sub>a</sub> = Frequency of respondents indicating always, N = Total number of observation = ∑ f<sub>i</sub>

*Satisfaction index:* In this index, respondents' level of satisfaction was computed to a statement related to forest resources use and perceived effectiveness towards CFW programme. Points of equal interval i.e., +1.00, 0.00 and -1.00 were employed respectively for 'Satisfaction', 'Neutral' and 'Dissatisfaction'. Satisfaction level was computed by applying the following formula

$$I = \frac{1.0 \times f_s + 0.0 \times f_0 - 1.00 \times f_d}{N} \quad (\text{Miah, 1993})$$

Where, I = Satisfaction index such that -1 ≤ I ≤ +1, f<sub>s</sub> = Frequency of respondents indicating Satisfied, f<sub>0</sub> = Frequency of respondents indicating Neutral, f<sub>d</sub> = Frequency of respondents indicating Dissatisfied, N = Total number of observation = ∑ f<sub>i</sub>

## Results and Discussion

*Population and socioeconomic structures:* Since household's head was interviewed, significant gender disproportion (78% male and 22% female) implies that majority of the households were male-headed (Table 1). High acceptance of traditional norms and cultural views by the local conservative community within the country is the justification of this context. Forestry Sector Study (1996) stated that only 3% female-headed households were there in the study area. Respondents interviewed were from a wide range of age classes i.e., 15 to 75 years (mean 39.7 and stdev. 11.06 years) (Table 1). 95% of the respondents were married with very big (5.12 ± 2.07) family size where 1.49 ± 0.75 was the mean number of persons earning for the family

(Table 1). According to Forestry Sector Study (1996) and Ghani (1990) the mean family size was 5.09 and 6.14 respectively.

Table 1. Population structures (head of the household, population age, matrimonial, mean family size and number of wage earner of the family in Dhaka Forest Division. M for male, F for female, m for married, um for unmarried and N for total sample size of the study area. Frequency of the parameters is in the parenthesis and value after  $\pm$  representing standard deviation.

Forest Range	Household head		Mean Age (years)	Marital Status		Mean Family Size	Mean Number of Wage Earner	N
	M %	F %		m %	um %			
Rajendrapur	80 (40)	20 (10)	40.84 $\pm$ 14.15	96 (48)	4 (02)	4.72 $\pm$ 1.97	1.44 $\pm$ 0.92	50
Sreepur	84 (42)	16 (08)	36.76 $\pm$ 8.54	100 (50)	0.00 (0)	5.32 $\pm$ 1.63	1.80 $\pm$ 0.76	50
Kachighata	88 (44)	12 (06)	45.88 $\pm$ 10.96	100 (50)	0.00 (0)	5.60 $\pm$ 2.71	1.28 $\pm$ 0.54	50
Kaliakoir	60 (30)	40 (20)	35.12 $\pm$ 6.25	84 (42)	16 (08)	4.84 $\pm$ 1.80	1.28 $\pm$ 0.54	50
Total	78 (156)	22 (44)	39.65 $\pm$ 11.06	95 (190)	5 (10)	5.12 $\pm$ 2.07	1.49 $\pm$ 0.75	200

Around 43% of the local people were literate (Forestry Sector Study, 1996 stated 36.61%) while 57% were illiterate in the study area (Table 2). The mean annual income based on the intuitive idea of the local people was 314.25  $\pm$  76.86 US\$ (334.76  $\pm$  55.85 US\$ for male and 241.59  $\pm$  56.40 US\$ for female) in the study area (Table 2). Forestry Sector Study (1996) stated that the mean annual income in the same area was 225 US\$ (300 US\$ for male and 150 US\$ for female). Generally local people endowed the land property from their ancestors and handed over to the generations as a heritage resulting fragmentation into smaller units over generations. Local land tenural system was not precise and reliable due possibly to too complex land tenural right and weakness of land allocation within the country. About 45% of the people in the community had land as their own with a mean land of 0.46  $\pm$  0.77 acres, and the rest 55% were landless (Table 2). Chowdhury and Hussain (1988) stated there was 55% household in Bangladesh and Forestry Sector Study (1996) stated 63 % households in the study area were landless.

Table 2. Socioeconomic structures (education, income, land tenure and land holding) of the study area. L for literate, IL for illiterate, Yr for years, ac for acres and n for total sample size. Values after  $\pm$  representing standard deviation and frequency of the parameters is in parenthesis.

Forest Range	Educational Status		Income (US\$/Yr)	Land tenural rights		Holed land property (ac)	N
	L %	IL %		Land owned %	Landless %		
Rajendrapur	44 (22)	56 (28)	315.64 $\pm$ 57.06	60 (30)	40 (20)	0.54 $\pm$ 1.12	50
Sreepur	52 (26)	48 (24)	320.76 $\pm$ 80.06	48 (24)	52 (26)	0.34 $\pm$ 0.32	50
Kachighata	28 (14)	72 (36)	313.00 $\pm$ 64.56	20 (10)	80 (40)	0.69 $\pm$ 0.97	50
Kaliakoir	48 (24)	52 (26)	307.60 $\pm$ 71.18	52 (26)	48 (24)	0.29 $\pm$ 0.21	50
Average	43 (86)	57 (114)	314.25 $\pm$ 67.86	45 (90)	55 (110)	0.46 $\pm$ 0.77	200

### ***Preferences/priorities of the local people towards CFW***

**Location:** Village vicinity was unanimously preferred (index 0.99) by the local people to grow woodlot (Table 3). Salam et al (2000), Fakir et al (1998) and Mehl (1990) also reported that CFW in the village vicinity would help solving accessibility, management and transportation problems. Near major (index 0.67) road and near watercourses (index 0.65) were almost equally preferred by those who are with very limited or no transportation facility and easy access to irrigation water to grow woodlot (Table 3). Fakir et al (1998) and Lai and Jarvis (1991) stated the same describing the due importance for establishing nursery, and irrigate plantations at the initial stage of plantation when heavy initial damage caused by severe drought. Near local market (index 0.42) was thirdly preferred followed by near agricultural field (index 0.02) at the lowest (Table 3). Mehl (1990) also stated that local people were unwilling to put woodlot near agricultural field except few scattered trees inside agricultural fields because heavy dense shades of trees will reduce agricultural crop production.

**Land types:** Woodlot can grow on a multifold land pattern. Total means priority indices showed that fallow land (index 0.87) and degraded forestland (index 0.83) was almost equally preferred land types to grow woodlot (Table 3). Mehl (1990) and Ahmed et al (1992) also reported this kind of preference by the local people for social/community forestry programme. Local people revealed that proper use of fallow land and providing protection to the degraded forestlands was the possible justification of such preferences. Local people were not alleged to put stress on farmlands (index 0.02) for forestry activity since it has been utilized for the production of food grains (Table 3). Degraded barren land (index 0.39) and pastureland (index 0.38) were equally preferred at the last level to grow woodlot possibly due to its poor fertility and alkalinity associated with hardpan formation from long time exposure (Table 3). Even though pasturelands may

biophysically be very suitable for woodlot establishment, local people put less preference on that because of their desire to keep it intact for livestock grazing.

*Forest resources use:* Forests provide a number of products and services to humankind for their daily life. Local people gave highest emphasis for fuelwood (index 0.99) whereas timber (index 0.24) was the lowest (Table 3). Salam et al (2000) and Salehuddin et al (1998) also similarly experienced. People living in this area are mostly poor who requires fuel to cook meal rather timber for furniture. House constructional materials (index 0.70) such as poles, post, etc. and agricultural implements (index 0.67) (Table 3) such as the local people almost equally preferred plough, cartwheel etc. from woodlot.

*Species:* Fast growing species such as *Acacia auriculiformis*, *Acacia mangium* and *Eucalyptus camaldulensis* were equally preferred (index 0.99) by the local people to grow in woodlot (Table 3). Lai and Jarvis (1991) and Salehuddin et al (1998) reported similar experience in this region. Whereas, slow growing species (index 0.02) was equally not preferred since high demand and quick return for fuel wood and small wood from woodlot (Table 3). Mehl (1990) have similar experience in one of the studies. Branchy (index 0.63) trees were also preferred in the second order due to its highest ability to quick of fuelwood and fodder (Table 3).

*Distance from dwellings:* The local people preferred the average maximum distance of  $0.84 \pm 0.31$  km (Table 3) from dwelling.

*Participation/performance of the local people towards CFW programme:* Inherently, local people has dependency on the local natural resources like forests, lands, water etc. for their daily life. Thus they would not hesitate to participate in forest conservation and management activities since their surrounding environment has denuded due especially to dramatically increased population and over exploitation of forest resources than that naturally restored.

*Forest conservation and management initiatives:* Participation from local people in forest conservation and management activities was very low (3%) (index 0.14) before the woodlot had established while the participation increased (53%) (index 0.70) during CFW programme (Table 3). This is because of the forest conservation and management activities seem to be very effective in reclamation and rehabilitation of degraded natural environment, providing more income-generating opportunities and stabilizing land and water resources (Mercado, 1987). Approximately 95% of the total respondents (Table 3) were very willing to participate in the woodlot programme to help make the programme success.

*Perception/satisfaction of the local people towards CFW programme:* Since, forestry is a long gestation practice, its sustainability depends heavily not only on the preferences and participation of the local community but also on positive perception. Only when the local people perceive that forest conservation and management programmes viz. woodlot can virtually satisfy the demand for basic forest resources such as fuel, fodder, food, agricultural implements, constructional materials etc. they would involve actively in the process of development initiatives.

*Forest resources availability:* Woodlot partially met the households' forest resource needs (satisfaction index 0.71) to the local people since most of them opined that there is gross scarcity of the forest resources to meet actual household needs (Table 3).

*Household fuel wood availability:* Fuel wood scarcity was severe for last few decades in the study area. Thus fuelwood production was the prime objective of the CFW programme. More than half of the local people were dissatisfied (index - 0.39) with the availability of fuelwood before the woodlot had established whereas majority were satisfied (index 0.94) during the CFW programme (Table 3). People who are not participating in the CFW programme eagerly revealed that they are supplementing fuelwood from neighboring plantation since woodlot had established.

*Forest Department's cooperation:* Forest Department's cooperation with local people in the process of CFW establishment was moderate (index 0.04) (Table 3). Local people opined few non-cooperation from Forest Department staffs such as improper disbursement and irregular renewal of Agreement Bond (Dalil) among the participants, inadequate help against theft of trees, land tenural conflict, slow dealing of pending cases in the forest court etc. Khan (1998) and Khan et al (1991) were similarly experienced in this connection.

*Overall satisfaction towards CFW programme:* Local people were moderately satisfied (index 0.50) with CFW programme (Table 3). The response from the local people on this question was not in any absolute extreme such as highly satisfactory or dissatisfactory. Mercado (1987) stated that about 50% local people were satisfied and 45% had no comment with the community forestry project activities, launched in 1982 among 23 districts out of 61 by the Bangladesh Forest Department and funded by UNDP and ADB.

Table 3. Community's preference, participation and perception indicators showing results indices either in percent or in fraction

Indicator	Main Result
<b>Forest Resources Use</b>	
Dependency on Sal forest for household's forest resources needs before community forestry woodlot had established	90% of the total respondents were depended
Problems to meet household's forest resources needs before community forestry woodlot had established	85% of the respondents were usually facing problems
Major Source of household's fuelwood before community forestry woodlot had established	Sal forest (80% of the respondents revealed)
Major source of household's fuelwood during community forestry woodlot	Sal forest & Woodlot (36% & 57% respondent opined respectively)
<b>Priorities/Preferences</b>	
Location	Village vicinity (index 0.99 out of 0.0 to 1.0)
Land types	Fallow & degraded forestlands (index 0.80 out of 0.0 to 1.0)
Forest Resources	Fuelwood (index 0.99 out of 0.0 to 1.0)
Species	Fast growing (index 0.99 out of 0.0 to 1.0)
Distance	Average 0.84± 0.31 km from dwellings
<b>Participation/Performance</b>	
Forest conservation & management activities before community forestry woodlot	Low (index 0.14 out of 0.0 to 1.0)
Willingness to establish and to be participant of woodlot	95% of the total respondents were willing
Forest conservation and management activities during community forestry woodlot	High (index 0.70 out of 0.0 to 1.0)
<b>Perception/Satisfaction</b>	
Meeting household's forest resources needs from woodlot	Satisfied (index 0.71 out of -1.0 to +1.0)
Cooperation from Forest Department in the process of community forestry woodlot	Moderate (index 0.04 out of -1.0 to +1.0)
Meeting household's fuelwood demands before community forestry woodlot	Moderate to high (index 0.39 out of -1.0 to +1.0)
Meeting household fuelwood demands during community forestry woodlot	Satisfied (index 0.94 out of -1.0 to +1.0)
Overall satisfaction towards community forestry woodlot	Moderately satisfied (index 0.50 out of -1.0 to +1.0)

*Key informants and informal groups interview:* Mostly the key informants and informal groups complemented the statement and information given by the households related to preferences, participation and perception on social and biophysical setting, land tenural and use rights, forest resources use and forest management and conservation initiatives.

## Conclusion

Several reasons exhibited for forest resources degradation and scarcity in the study area, out of which two major reasons were overwhelmingly responsible. Over exploitation of fuelwood and development of agriculture respectively for household's energy and food security compelled local people to convert forestland to non-forest uses such as agriculture and housing. A large part of the area was under the occupation of squatters. Even if it were possible to evict the squatters, protection of forest and establishment of plantation efforts was not easy to succeed without the active participation of the local community in forest conservation and management activities. Local peoples' dependency for household forest resources needs was mostly on natural Sal forests before the CFW programme had launched. This pressure on natural Sal forests substantially reduced since the commencement of the CFW programme. Woodlot to be established on fallow and degraded forestlands near the village vicinity (within 1.00 km) using fast growing species with the principal objective of producing fuelwood as the demand indicated by most of the local people for their family subsistence. Local people also perceived woodlot as a good source of fuelwood in particular and other forest products and services in general. Forest Department cooperation in the process of CFW programme to be a success was not satisfactory.

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