

Present status of bamboo production in Mymensingh district

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Abstract: The study was conducted to estimate the status of bamboo production in Mymensingh Sadar and Muktagacha Upazila of Mymensingh district. Data were taken on 80 homesteads from four unions namely Boyra, Babukhali, Ghoga and Kasimpur. From each union four villages and from each village five households were also randomly selected from each village for data collection. Data were collected by using interview schedule during 29 August to 15 October, 2009. Six bamboo species viz. *Bambusa bambos*, *Bambusa polymorpha*, *Bambusa vulgaris*, *Bambusa longispicu*, *Bambusa balcooa* and *Dendrocalamus strictus* were identified. Only one percent bamboo was cultivated as single crop in other case it was cultivated as mix item of homestead plantation. The available land area for bamboo production decreased to 0.01 hectare and average of land area occupied by bamboo also decreased to 0.02 hectare within last ten years. The number of bamboo garden decreased 30 percent in last ten years and total 77.6 percent bamboo garden decreased within last thirty years. Average height and density of culms in a garden is good at present time but average diameter and leaf freshness is not satisfactory. Bamboo is widely used in this area in housing and as a building material. About 65 percent peoples in the study area earn less than two thousand taka in a year from bamboo. In this area, 92 percent people invested no extra money for bamboo cultivation. In the study area the demand of bamboo is very high at present time but production is low. The main causes of decreasing bamboo production are lack of land, death of culms and lack of willingness of the farmers in bamboo plantation.

Key words: Status, bamboo production and uses.

Introduction

Forest is important natural resources of a country. A country needs minimum 25% forest for sustainable environment. But we have only 17.04% forest (BBS, 2008). The village forests composed of woodlots and other multipurpose fast growing trees, bamboos, canes and shrubs. Bamboo is the fastest-growing plant on earth and its family is poaceae. Bamboo thrives through socialization with human culture. As a woody grass, bamboo is perfectly suited to agroforestry. It fits well in agroforestry situations such as intercropping, soil conservation and yields value added products such as timber, livestock forage, shoots, fiber and craft wood. Bamboos are very interesting plants in their growth, morphogenesis, taxonomy, distribution, ecology and reproduction. Bamboos have an extremely wide range of global distribution (Uchimura, 1987). More than 33 bamboo species have been found in Bangladesh out of which 7 are occurring naturally in the forests of Chittagong Hill Tracts, Cox's Bazar, Sylhet and Northern Mymensingh in association with other tree species or as pure stand. The rest are being cultivated by the people in the village through out the country (Banik, 1980). Drigo *et al.* (1988) inventoried the forest resources of Sylhet Forest Division under FAO / UNDP project BGD / 85 /085 and reported that bamboos were found to occur in 13,933 hectare of forest lands. In Chittagong Hill Tracts, about 74,084 hectare of forest areas occurred in the predominantly bamboo types (mixed bamboo timber plus bamboo) according to 1983 inventory report of FAO / UNDP project BGD / 79 /017,1985. According to the above inventory report the estimated overlapping and major bamboo areas of Chittagong and Cox's Bazar forests are 86,970 hectare. Most of the people living in rural areas of Bangladesh are poor and below the poverty line. Bamboo is the low cost and affordable building material for the rural people. Considering the wide range of uses of bamboo as construction materials it is called the "poor men's timber". Human civilization greatly depends on the adequate forest cover on earth. But today the status of forest cover shrunk to an alarming level. Bamboos are very important forest products of Bangladesh. Now both

natural and village bamboo scarcity exist seriously and the population increase is considered the main cause. According to Forestry Master Plan (Wells *et al.*, 1994), forest bamboo is declining at about 3% per year. According to Banik (1992), *Dendrocalamus hamiltonii*, *Melocalamus compactiflorus*, and *Neohouzeaua dullooa* have now become threatened bamboo species in Bangladesh. In view of the above facts, raising awareness of bamboo cultivation is very important for rural housing in Bangladesh. Thus the present study has been undertaken to observe the status of bamboo cultivation in Mymensingh district, one of the important bamboo producing area of Bangladesh.

Materials and Methods

The Locale of the study: Two upazilas namely Sadar and Muktagacha under Mymensingh district were purposively selected for the study. From Sadar upazila, two union viz. Baera and Bhabkhali, and from Muktagacha upazila, Ghoga and Kashimpur union were selected. From each union four villages, and from each village, five homesteads were selected. Thus a total of 80 homestead were used for data collection.

Population and sample of the study: There are about 100 farm families were listed in advance in each village by the researchers from the study area which was considered as the population of the study. However, 5% farm families from each village were selected randomly as the sample of the study. Thus, the actual size of the sample was 80.

The research instrument: A structured interview schedule was prepared for collection of valid and consistent data in accordance with the objectives of the study. The draft interview schedule was prepared and pre-tested before using the same for final collection of data. Necessary corrections, additions and adjustment were made in the interview schedule on the basis of the pretest results.

Period of Data Collection: Data were collected through personal interviewing by the researcher himself during 29 August to 15 October, 2009. Afterward the collected data were compiled, tabulated and analyzed for interpretation.

Variables of the study: Nine selected individual characteristics of the respondents' viz. age, education, family size, Occupation, land size, family income, family expenditure, major trees in homesteads and major cultivated crops were selected as the independent variables for this study. On the other hand, status of bamboo production was the dependent variable of the study.

Measurement of Variables: The age of respondents was measured by counting the period of time from his birth to the time of interview on the basis of response of the respondent and was expressed in terms of years. Education of respondents was measured in terms of classes passed by him. For example, a score of 5 was given for primary level of education, 10 for secondary education 12 for higher secondary education and so on. In the same way a score of zero (0) was given a respondent who don't know reading and writing, and a score of (1) was assigned to those respondent who can sign only. The family size of a respondent was determined in terms of the total number of members of his family. The family member included respondent himself, spouse, sons, daughters and other dependents. The occupation of a respondent was determined by the activity of the respondent that means

what types of work he done, such as agriculture, job, business and others. Annual income of a respondent was measured in taka based on his total yearly earning from different sources, such as agricultural crops, livestock & poultry rearing, fish culture, homesteads, job, business and others. The land size of a respondent was measured to the total area of land on which respondent's family carried farming operation. Annual expenditure of a respondent was measured in taka based on his total yearly spend for different purpose, such as food, cloth, housing, health, education, social & other expenditure, agricultural cost etc. The plant species that cultivated largely by the respondent was counted here as major trees in homestead, such as fruit tree, forest tree, medicinal tree and others. The plant species that cultivated largely by the respondents was counted here as major cultivated crops, such as rice, wheat, vegetables, maize, jute and others. In order to measure the status of bamboo production, the available land for bamboo production, amount of land occupied by bamboo, number of bamboo garden, number of emerge and death culms, health condition of bamboo, different uses, income from bamboo and expenditure for bamboo production are considered.

Table 1. Salient features of the respondents selected characteristics as independent variables

Selected Characteristics	Categories	Respondents		Scoring unit	Range	Mean	SD
		No.	%				
Age	Middle age (40-50)	06	7.5	Year	45-70	56.43	6.67
	Old age (50-70)	74	92.5				
Education	Illiterate (0)	06	7.5	Year of schooling	0-15	5.75	4.40
	Primary (1-5)	40	50				
	Secondary (6-10)	20	25				
	Higher secondary (12)	02	2.5				
	Above higher secondary (15)	12	15				
Family size	Small (up to 5)	02	2.5	Number	5-14	8.98	1.98
	Medium (5-10)	21	26.3				
	Large (above 10)	57	71.2				
Occupation	Agriculture	49	61.3	Rated score	13-49	-	-
	Service	13	16.3				
	Business	18	22.4				
Land size (in hectare)	Small, >0.6	56	70	Hectare	0.2-0.8	0.57	0.20
	Medium, <0.6-0.8	13	16.3				
	Large, <0.8	11	13.7				
Family income	Low income, >95	41	51.3	Thousand (000) Taka	52 -221	97.31	23.44
	Medium income, <95-100	29	36.2				
	High income, <100	10	12.5				
Family expenditure	Low, >50	02	2.5	Thousand (000) Taka	39-144	84.08	19.24
	Medium, <50-75	20	25				
	High, <75	58	72.4				
Major trees in homestead	Fruit tree	65	81.2	Rated score	1-65	-	-
	Forest tree	08	10				
	Medicinal tree	01	1.3				
	Others	06	7.5				
Major cultivated crops	Rice	78	78.1	Rated score	0-78	-	-
	Wheat	01	1				
	Vegetables	0	0				
	Maize	0	0				
	Jute	0	0				
	Others	01	1				

Analysis of data: After completion of field surveys data from the entire interview schedule were coded, compiled and subjected to appropriate analytical techniques in

accordance with the objectives of the study. In this process all the responses in the interview schedule were given numerical coded values and analyzed. The responses to the

questions in the interview schedules were transferred to a master sheet to facilitate tabulation. The computer software SPSS were used in this study. Statistical measures such as number, percentage, frequency distribution, range, rank order, mean, standard deviation etc. were used in describing the variables. In addition, graphs and tables were also used to interpret the findings.

Results and Discussion

Some basic characteristics of the respondents: Data organized regarding the personal characteristics of the respondents' shows that the most of the respondents (92.5%) belong to old aged, while 7.5 percent of them being middle aged. Half of the respondents (50%) had primary education, 25 percent had secondary education, 2.5 percent had higher secondary education, 15 percent had above higher secondary education, and only 7.5 percent of the respondents were illiterate. Large portion of the respondents (71.2%) belongs to large size family, 26.3

percent belongs to medium size and 2.5 percent belongs to small size. Majority of the respondents (61.3%) belongs to 'agriculture' as their major occupation, 22.4 percent were businessman and 16.3 percent were service holder. The findings showed that highest proportion of the respondents (70%) was small farmers followed by 16.3 percent medium and only 13.7 percent large farmers. The findings revealed that above half of the respondents (51.3%) were low, 36.2 percent of the respondents were medium and only 12.5 percent were in high income category. As regards family expenditure, 2.5 percent of the respondents were found low, 25 percent were medium and 72.4 percent in high expenditure category. As regards of major trees in homesteads, 10 percent were planted forest tree, 1.3 percent planted medicinal tree and 7.5 percent of the respondents largely planted others tree. The findings showed that rice was largely (97.5%) cultivated by the respondents in the study area (Table 1).

Table 2. Status of land area for bamboo production

Time	Land area for bamboo production			Amount of land occupied by bamboo		
	Min.	Max.	Mean	Min.	Max.	Mean
Present	0.01	0.08	0.03	0.02	0.04	0.011
10 years ago	0.02	0.10	0.04	0.02	0.08	0.013
20 years ago	0.02	0.10	0.05	0.04	0.08	0.020
30 years ago	0.03	0.12	0.05	0.03	0.10	0.022

Table 3. Number of bamboo garden recorded in the study area

Time	Number of bamboo garden				
	Min.	Max.	Total	Mean	Standard deviation
Present	02	10	307	4.83	1.81
Before 10 years	03	12	443	5.53	1.91
Before 20 years	03	14	551	6.88	2.27
Before 30 years	01	15	585	7.31	2.61

Status of bamboo production: The range of available land area for bamboo production is 0.01 to 0.08 hectare at present time, before 10 or 20 years it was 0.02 to 0.10 hectare and before 30 years it was 0.03 to 0.12 hectare. On the other hand, the range of land area occupied by bamboo is 0.02 to 0.04 hectare at present time but it was 0.02 to 0.08 hectare before 10 years, 0.04 to 0.08 hectare before 20 years and 0.03 to 0.10 hectare before 30 years (Table 2). After calculation it was found that, the available land area for bamboo production decreased 0.01 hectare and average of land area occupied by bamboo decreased 0.02 hectare within last ten years. Banik (1993) stated that conservation of bamboo forests into plantations through clear felling, burning and encroachment of land have created adverse impact on the areas of bamboo vegetation. According to him, the annual loss of bamboo area is about 2.3 percent per year.

Number of bamboo garden: The range of the number of bamboo garden in a homestead is 02 to 10 at present time; before 10 years it was 03 to 12, before 20 years it was 03 to 14 and before 30 years it was 01 to 15. Total numbers of bamboo garden were 307 at present time; before 10 years it was 443, before 20 years it was 551 and before 30 years it was 585 (Table 3). Total number of bamboo garden decreased 30 percent in last ten years and total 77.6 percent bamboo garden decreased within last thirty years.

From the study, it is clear that bamboo production is declining. Similar declining trend was also reported by Anupam *et. al.* (2003) who described the current status of bamboo in India. He also pointed out the importance of bamboo in the Indian economy and its potential role for socio-economic development.

Present demand and production of bamboo: About 88% of the respondents opined that the demand of bamboo is very high at present time; ten percent stated that the demand is high now, and only one percent was in opinion that there is no change in demand of bamboo. Other hand, 73 percent said that the production of bamboo is low at present time and, 4 percent said that the production is very low and only 3 percent said that there is no change in bamboo production (Table 4). Bamboos have diversified uses in the country. Its high demand has been recognized with the reduction of timber production in the country (Amin *et al.*, 1996). The demand of bamboo is also high in many Asian countries, as it is used in many different purposes. According to Wang and Guo (2003), the current application of bamboo materials in construction, production of laminated boards and bamboo mat plywood, bamboo ceiling and wall material technologies, door and window material from bamboo etc.

Health condition of bamboo garden: The health condition of bamboo garden includes average height,

average density, average diameter and leaf freshness of bamboo. Most of the respondents (82.5%) said that average height of culms is good at present time; while 100 percent said that it was good in 30 years ago. About 13 percent of the respondents said, average density is very good at present time. Otherwise about 72 percent of the respondents said, average density was very good in 20 years ago. Most of the respondents (95%) said that

average diameter was good in 30 years ago but only 1 percent said it is good at present time. About 95 percent of the respondents said that leaf freshness of bamboo is bad at present time (Table 5). So, average height of culms and density of culms in a garden is only good at present time but average diameter and leaf freshness is not good. It is cleared that the health condition of bamboo garden is not satisfactory now.

Table 4. Present demand and production of bamboo

Category	Demand of bamboo		Production of bamboo	
	Frequency	Percentage	Frequency	Percentage
Low	00	0	73	73
Very low	00	0	04	4
High	08	10	00	0
Very high	71	88.8	00	0
No change	01	1.2	03	3
Total	80	100	80	100

Table 5. Health condition of bamboo garden

Category	Average height							
	At Present time		Before 10 years		Before 20 years		Before 30 years	
	No.	%	No.	%	No.	%	No.	%
Very good	3	3.8	1	1.3	7	8.75	-	-
Good	66	82.5	70	87.4	73	91.25	80	100
Medium	4	5	9	11.25	-	-	-	-
Bad	7	8.75	-	-	-	-	-	-
Very bad	-	-	-	-	-	-	-	-
Category	Average density							
	No.	%	No.	%	No.	%	No.	%
	Very good	11	13.8	32	40	58	72.5	53
Good	54	67.4	45	56.2	20	25	16	20
Medium	13	16.3	3	3.8	2	2.5	10	12.4
Bad	2	2.5	-	-	-	-	01	1.3
Very bad	-	-	-	-	-	-	-	-
Category	Average diameter							
	No.	%	No.	%	No.	%	No.	%
	Very good	-	-	-	-	-	-	1
Good	1	1.3	1	1.3	78	97.5	76	95
Medium	2	2.4	77	96.1	2	2.5	3	3.7
Bad	76	95	1	1.3	-	-	-	-
Very bad	1	1.3	1	1.3	-	-	-	-
Category	Leaf freshness							
	No.	%	No.	%	No.	%	No.	%
	Very good	-	-	-	-	-	-	3
Good	2	2.5	4	5	75	93.8	72	90
Medium	2	2.5	76	95	5	6.2	5	6.2
Bad	76	95	-	-	-	-	-	-
Very bad	-	-	-	-	-	-	-	-

Table 6. Income from bamboo selling and usage

Categories	Income from bamboo selling			
	Frequency	Percent	Mean	Standard deviation
>2000	74	92.40		
<2000-2000	02	2.60	668.98	1020.34
<3000	04	5.00		
Total	80	100	-	-
Categories	Income from own usage			
	Frequency	Percent	Mean	Standard deviation
>2000	75	93.70		
<2000-2000	03	3.80	1421.87	638.47
<3000	02	2.50		
Total	80	100		
Categories	Total income from bamboo			
	Frequency	Percent	Mean	Standard deviation
>2000	52	65.00		
<2000-2000	22	27.5	2082.50	1452.23
<3000	06	7.5		
Total	80	100	-	-

Table 7. Uses of bamboo

Housing purpose			
Categories in taka	Frequency	Percent	Mean
>1000	13	16.3	2007.50
<1000-2000	36	45	
<2000	31	38.7	
Total	80		
Fence purpose			
>200	42	52.4	260.62
<200-400	25	31.3	
<400	13	16.3	
Total	80	100	
Fuel purpose			
>100	12	13.9	21.79
<100-200	66	83.6	
<200	02	2.5	
Total	80	100	
Furniture purpose			
>100	50	62.5	74.35
<100-200	18	22.6	
<200	12	14.9	
Total	80	100	
Other purpose			
>100	23	28.7	191.25
<100-200	32	40	
<200	25	31.3	
Total	80	100	

Distribution of bamboo and its species: In the study area most of the bamboo gardens (65%) are located in scattered way, 18% near homesteads, 15% near pond sides and about 1% as single bamboo garden. A total of six bamboo species viz. *Bambusa bambos*, *Bambusa polymorpha*, *Bambusa vulgaris*, *Bambusa longispicu*, *Bambusa balcooa* and *Dendrocalamus strictus* were identified in the study area. The species of bamboo growing in the homesteads and forests varied from place to place. Banik (1994) reported that seven different bamboo species have been growing in the forests of Sylhet, Chittagong Hill tracts, Chittagong and Cox's Bazar of Bangladesh which were common to the present study.

Expenditure and income from bamboo production: About 92 percent of the respondents do not spend money for bamboo production. Some of the respondents spend money for bamboo production as operational cost. In the study area the respondents earn money from bamboo. It is estimated by calculating the usage bamboo price and sold bamboo price. Exactly 65 percent of the respondents earn more than two thousand taka in a year from bamboo production, 27.5 percent of the respondents earn less than two thousand taka in a year, and only 7.5 percent earn less than three thousand taka in a year from bamboo (Table 6). It is evident from the study that the price of bamboo is increasing very fast. Ahmed (1999) reported that the price of an average size bamboo pole has increased from Tk. 80 in 1990 to Tk. 100 in 1997 which support the higher income from bamboo production in the present study.

Uses of bamboo: Bamboo is widely used in this area in housing purpose as a building material. Exactly 45 percent of the respondents were spent more than one thousand taka for bamboo in housing purpose. The usage categories are

housing, fence, fuel, furniture and others, such as for thatching & roofing, construction, walking stick, basket making, water and milk vessels, hedges, agricultural implements, fodder, tool handles, hookah pipes, fishing rods, chicks for doors & windows, pipes, ladders, musical instruments, stakes for plantation, fishing implements, boat roofs, ornaments, bridges, rickshaw hoods, handicrafts, umbrella handles, medicinal etc. The mean of spent taka for bamboo usage were in housing purpose 2007.5, in fence purpose 260.62, in fuel purpose 21.79, in furniture purpose 74.35 and in others purpose the mean was 191.25 (Table 7).

Cause of declining bamboo production: In the study area, about 6% of the respondents have done intercultural operation after bamboo plantation. Among the 80 respondents 75 person planted bamboo without any intercultural operation. About 56% of the respondents said that the main cause of bamboo production decreasing is lack of land; about 33% said that main cause is death of culms; about 8% said that main cause is lack of willingness and only 1% shows other cause.

In the study area bamboos are declining at a gradual rate. Bamboo production has decreased considerably in Mymensingh district due to the lack of proper maintenance & systematic cutting, increase population & land scarcity, harvested immature culms, attack of insects & pests and bamboo disease mainly bamboo blight. Once people of other parts of the country used to come here for purchasing bamboo, but now-a-days nobody comes here for this purpose. The non-availability of bamboo increases its price significantly. At present a piece of bamboo is sold at 90-150 taka in local market. About 20/25 years back if one visited any rural household in the study area one could

easily see a little bamboo garden in the back yard of the house. At that time the population of this area was not as high as now, so there was enough place for all households to have a little bamboo garden which would grow without needing much care or nurturing. As time has passed, with high population growth, cultivable land in this area has become scarcer. As bamboo continues to play a vital role as a building material there is still a high demand for it as a building material and also for many other purposes.

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