RESEARCH ARTICLE

EXPLORING IMPROVED AGROFORESTRY PRACTICED FARMER'S SOCIO-DEMOGRAPHIC CHARACTERISTICS AND THEIR LIVELIHOOD IN SELECTIVE CHARLANDS OF BANGLADESH

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ABSTRACT

A baseline survey is very much important to identify the preliminary condition of a certain group or the people of a certain area and/or whole country. A baseline study is one that looks at study characteristics at a particular time or under a particular set of conditions to establish a "base line. The study accounting data of 80 farmers were collected from Bolaierchar and Bagolgor char under Sherpur district and Naovangar char and laxmir char from Jamalpur district for base line survey of upliftment of farmers livelihood and enrichment of environment through improve agroforestry practice in charland ecosystem of Bangladesh project by using Random Sampling Technique method. Data refer to the input output details and other socio-economic characteristics of upliftment of farmers livelihood in the crop year 2017-2018. Random sampling technique has been used for collecting data. The result of the baseline survey showed that out of 80 sample farmers two locations in agroforestry practicing household's age was categorized at five age groups such as 20-29 years, 30-39 years, 40-49 years, 50-59 and 60-69 years. The sample households were classified into three groups based on their educational level such as; illiterate, can sign and primary and above. The family size was categorized by five categories such as number of member's 3-5 persons, 6-8 persons, 9-11 persons and 12-14 persons, 15-18 persons. The average annual incomes were categorized into Tk.50000 to Tk.99999, Tk.100000 to Tk.149999, Tk.150000 to Tk.199999, Tk.200000 to Tk.249999 and Tk.250000 to Tk.300000. Total 17 tree species were recorded from the selected farm families of four different char village of Sadar upazila of Jamalpur and Sherpur district (Table 6) of which mango (99%), jackfruit (95%), black berry (26%), guava (22%), lemon (21%) and bamboo (20%) are the dominant tree species. Total 8 different existing agroforestry models were recorded in the studied charland areas. Among these different existing models very common model was Bean and Jiga tree-based agroforestry which was found in only 20% surveyed family.

KEYWORDS

Baseline survey, upliftment, livelihood, enrichment, environment, agroforestry practice, charland ecosystem

1. INTRODUCTION

In Bangladesh, there are about 0.82 million hectares of char land (Ahmed et al., 1987). "Charland" is the Bengali term, its English meaning is "Riverine Island" for mid-channel island that emerges periodically from riverbed as a consequence of accretion (Elahi, 1991). In Bangladesh the char lands can be divided into five sub areas which has highly potential for groundnut production (The Jamuna, the Ganges, The Padma, The upper Meghna and the lower Meghna River) where Tista and old Brahmaputra also constitute some char land areas (Islam et al., 2012). In Bangladesh scope of agroforestry is vast. The total forest of Bangladesh was 1575196.01 hectare (BBS, 2019). The main venues of agroforestry are homestead, roadside, railway side, embankment side, charland, coastal area, deforested area, institutional premises, riverside etc. Among them

charland is the most important venue for practicing agroforestry systems.

The major char inhabited districts of Bangladesh are Jamalpur, Sirajgonj, Noakhali, Bogra, Rangpur and Mymensingh. A large number of populations are living in these char areas and maintaining their livelihood through char-based farming systems. Therefore, for increasing production, maintaining ecological balance and improving socio-economic condition of the charland people, integrated approach with crop and trees is necessary. A baseline survey is very much important to identify the preliminary condition of a certain group or the people of a certain area and/or whole country. A baseline study is one that looks at study characteristics at a particular time or under a particular set of conditions to establish a "base line." This could be the incidence rate of a particular condition or any of a number of other items.

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Subsequent studies of the same or similar workplaces at different times or under different circumstances will be conducted to see if there are changes as compared to that "base line." Then the researcher will attempt to determine whether the changes were related to any of the differing circumstances. In farming system research and development, baseline survey has been conducted to identify the socioeconomic condition of farmers as base time period and cut a decision to take steps to improve farming for better livelihood. This study was conducted under the project title "Upliftment of farmers livelihood and Enrichment of environment through improve agroforestry practice in charland ecosystem of Bangladesh (Project ID: 077)".

2. METHODS AND MATERIALS

2.1 Location of the Study

The survey site was of medium high land belonging to the agro-ecological zone Old Brahmaputra Floodplain under Agro-Ecological Zone 8 and 9 (UNDP and FAO, 1988). NaoVangar Char, and Laxmir Char of Sadar upazila of Jamalpur district were selected as study area. Jamalpur Sadar Upazila (Jamalpur district) area 489.56 sq km, located in between 24°42' and 24°58' north latitudes and in between 89°52' and 90°12' east longitudes. It is bounded by Sherpur sadar and Nakla upazilas on the north, Madhupur, Dhanbari and Muktagacha upazilas on the south, Muktagacha and Mymensingh Sadar upazilas on the east, Melandaha and Sarishabari upazilas on the west. Jamalpur Sadar has a population of 568726.

Males constitute are 51.02% of the population, and females 48.98%. Sherpur Sadar is located at N 24°58'59.32885// to E 90°6'21.61531//. It has 80,091 units of house hold and total area 360.01 sq.km. Sherpur Sadar Upazila with an area of 360.01 sq.km, is bounded by Sreebardi, Jhenaigati and Nalitabari upazila on the north, Jamalpur sadar upazila on the south, Nakla upazila on the east and Islampur and Melandaha upazilas on the west. Main rivers are Old Brahmaputra, Mrigi and Doshani; Aurabaura, Nishla, Dhala, Isl, Mausi are noted Beels. Sherpur (Town) stands on the bank of the Mrigi. Sherpur Sadar has a population of 381,419. Males constitute are 51.58% of the population, and females 48.42%.

2.2 Study area

Selection of the study area is an important step and largely depends upon objectives or purpose of the study. According to Yang (1962) the farm area in which a survey is to be made depends on the particular purpose of the survey and the possible cooperation of the farmers.

2.3 Data

The study accounting data of 40 farmers were collected from Bolaierchar and Bagolgor char under Sherpur district and Naovangar char and laxmir char under Jamalpur district for base line survey of Upliftment of farmers livelihood and Enrichment of environment through improve agroforestry practice in charland ecosystem of Bangladesh project by using Random Sampling Technique method.

2.4 Sample Size

The study accounting data of 40 farmers were collected from Bolaierchar and Bagolgor char under Sherpur district and Naovangar char and laxmir char from Jamalpur district for base line survey of Upliftment of farmers livelihood and Enrichment of environment through improve agroforestry practice in charland ecosystem of Bangladesh project by using Random Sampling Technique method.

2.5 Processing, Analysis and Presentation of Data

After collection of data, each interview schedule was verified for the sake of consistency and completeness. Editing was done before putting the data in the computer. Summarization, careful scrutiny and necessary summary tables have been made from the data. Tabular techniques have been used for analysis, interpretation and presentation of data to fulfill the objectives of the base line survey.

3. RESULTS AND DISCUSSION

Information regarding age of the farmer, education level, family size, farm size, family income, livelihood status, tree species diversity, tree density, existing agroforestry models obtained from Baseline survey are presented below:

3.1 Age distribution of the sample household

Age is an important factor that influences farmer's production decision, efficiency and adoption of improved agroforestry technologies. Agroforestry practicing household's age was categorized at five age groups such as 20-29 years, 30-39 years, 40-49 years, 50-59 and 60-69 years (Table 1). In the study areas, highest percentage of farmers (40%) was in the age group of 30-39 years and 40-49 years in laxmir char, whereas it (35%) was in the age group of 40-49 years in Naovangar char of Jamalpur district. On the other hand, in Sherpur district highest percentage of farmers (45%) was found in the age group between 40-49 years in Bagolgor char whereas it (40%) was found in age group between 30-39 years in Bolaier char. The lowest percent (6.25%) of farmers were found under the age group of 60-69 years in all area. So maximum agroforestry practicing farmers were relatively middle aged whose age limit between 30-49 years.

Table 1: Age distribution of the sample household

Age group	Jamalpur			Sherpur			Grand Total (N=80)
	Laxmir char (n=20)	Naovangar char (n=20)	Jamalpur Total (n=40)	Bagolgor char (n=20)	Bolaier char (n=20)	Sherpur Total (n=20)	
20-29	5	10	7.5	10	10	10	8.75
30-39	40	25	32.5	30	40	35	33.75
40-49	40	35	37.5	45	15	30	33.75
50-59	10	20	15	5	35	20	17.5
60-69	5	10	7.5	10	0	5	6.25
Total	100	100	100	100	100	100	100

3.2 Education level of the sample household

The sample households were classified into three groups based on their educational level such as; illiterate, can sign and primary and above. Information on the educational levels of the respondents is presented in Table 2. Majority of the household heads were illiterate (37.5%) in Jamalpur district and highest percentage (55%) was found in Naovangar char. On the other hand, 42.5% illiterate households were found in Sherpur district in which highest percentage (60%) were found in Bolaier char. On an average, 40% households were illiterate followed by 30% household can sign only and 30% household were primary and above level.

3.3 Family size of the sample household

Family size included the number of adult male, adult female and children of the respondent households. The family size was categorized by five categories such as number of member's 3-5 persons, 6-8 persons, 9-11 persons and 12-14 persons, 15-18 persons (Table 3). Majority of the household's (57.5%) family size was 3-5 persons in Jamalpur district whereas in Sherpur district it (47.5%) was 6-8 persons. On an average, 3.75% household had 15-18 persons in both district.

Table 2: Education level of the sample household

Educational level	Jamalpur			Sherpur			Total (N=80)
	Laxmir Char (n=20)	Naovangar char (n=20)	Jamalpur Total (n=40)	Bagolgor char (n=20)	Bolaier char (n=20)	Sherpur Total (n=40)	
Illiterate	20	55	37.5	25	60	42.5	40
Can sign only	40	20	30	45	15	30	30
Primary & above	40	25	32.5	30	25	27.5	30
Total	100	100	100	100	100	100	100

Table 3: Family size of the sample household

Family size	Jamalpur			Sherpur			Grand Total (N=80)
	Laxmirchar (n=20)	Naovangar char (n=20)	Jamalpur Total (n=40)	Bagolgor Char (n=20)	Bolaier char (n=20)	Sherpur Total (n=40)	
3-5	75	40	57.5	40	25	32.5	45
6-8	20	50	35	50	45	47.5	41.25
9-11	--	5	2.5	--	15	7.5	5
12-14	5	--	2.5	5	10	7.5	5
15-18	--	5	2.5	5	5	5	3.75
Total	100	100	100	100	100	100	100

3.3 Income distribution of the sample household and livelihood status

Livelihood standard of the household depends on their annual income per household. The average annual incomes were categorized into Tk.50000 to Tk.99999, Tk.100000 to Tk.149999, Tk.150000 to Tk.199999, Tk.200000 to Tk.249999 and Tk.250000 to Tk.300000. It was evident from the table 4 that 50% household rested on income group Tk.50000 to Tk.99,999 in Jamalpur district whereas it was 45% in Sherpur district. On an average 3.75% households had annual average income between Tk.250000-

Tk.300000 in Sherpur district. Total annual income obtained from different category viz. crops, vegetables, fuelwood, fruits, duck/hen, livestock, fisheries, service, business, labour and agroforestry. Generally, major annual income comes from crops, vegetables, service, duck/hen and business. Substantial income comes from labor and fisheries. Minor contribution was obtained from agroforestry related activities viz. fruit, fuel wood, combined production of trees and crops. From the above information it was clear that there is scope to improve livelihood status of char land farmers with practicing agroforestry system.

Table 4: Income distribution of the sample household

Income group	Jamalpur			Sherpur			Grand Total (N=80)
	Laxmir Char (n=20)	Naovangar char (n=20)	Jamalpur Total (n=40)	Bagolgor char (n=20)	Bolaier char (n=20)	Sherpur Total (n=40)	
50000-99999	45	55	50	55	35	45	47.5
100000-149999	35	25	30	30	25	27.5	28.75
150000-199999	10	15	12.5	5	20	12.5	12.5
200000-249999	10	5	7.5	5	10	7.5	7.5
250000-300000	--	--	--	5	10	7.5	3.75
Grand Total	100	100	100	100	100	100	100

3.4 Farm size of the sample household

Table 5 showed the average farm size of different char household in Jamalpur and Sherpur district. It was evident from the table that majority (72.5%) of the household had an average farm size below the 1 hectare in

Jamalpur district whereas it was 50% in Sherpur district. On an average 61.25% household had below the 1 hectare land in both district. Only 20% household had the farm size between 1.0 to 2.0 hectare of land. Only 2.5% household in Sherpur district had 5.0 to 6.0 hectare land.

Table 5: Farm size of the sample household

Farm size	Jamalpur			Sherpur			Total (N=80)
	Laxmir Char (n=20)	Naovangar char (n=20)	Jamalpur Total (n=40)	Bagolgor Char (n=20)	Bolaier char (n=20)	Sherpur Total (n=40)	
0.01-1.0	75	70	72.5	60	40	50	61.25
1.0-2.0	15	10	12.5	20	35	27.5	20
2.0-3.0	5	5	5	10	10	10	7.5
3.0-4.0	5	10	7.5	--	5	2.5	5
4.0-5.0	---	5	2.5	5	5	5	3.75
5.0-6.0	--	--	--	5	5	5	2.5
Grand Total	100	100	100	100	100	100	100

3.5 Existing tree diversity and density

Total 17 tree species were recorded from the selected farm families of four different char village of Sadar upazila of Jamalpur and Sherpur district

(Table 6) of which mango (99%), jackfruit (95%), black berry (26%), guava (22%), lemon (21%) and bamboo (20%) are the dominant tree species (Table 6).

Table 6: List of tree species in the char areas of Jamalpur and Sherpur district

Sl. No.	Tree Species	% Farmers Possessing	Rank
1	Mango (<i>Mangifera indica</i>)	99	1
2	Jackfruit (<i>Artocarpus heterophyllus</i>)	95	2
3	Black berry (<i>Syzygium cumini</i>)	26	3
4	Guava (<i>Psidium guajava</i>)	22	4
5	Lemon (<i>Citrus spp</i>)	21	5
6	Bamboo (<i>Bambusa vulgaris</i>)	20	6
7	Akashmoni (<i>Acacia auriculiformis</i>)	19	7
8	Mahogany (<i>Swietenia macrophylla</i>)	18	8
9	Litchi (<i>Litchi chinensis</i>)	18	8
10	Boroj (<i>Ziziphus jujuba</i>)	12	9
11	Eucalyptus (<i>Eucalyptus camaldulensis</i>)	10	10
12	Coconut (<i>Cocos nucifera</i>)	9	11
13	Bel (<i>Aegle marmelos</i>)	7	12
14	Sada Koroi (<i>Albizia procera</i>)	4	13
15	Betel Nut (<i>Areca catechu</i>)	4	13
16	Pomegranate (<i>Punica granatum</i>)	2	14
17	Sajna (<i>Moringa oleifera</i>)	2	14

3.6 Existing Agroforestry models

Based on Baseline survey a few tree crop combination was recorded separately for charland and homestead in char villages which can be considered as separate agroforestry models. Total 8 different existing

agroforestry models were recorded in the studied charland areas. Among these different existing models very common model was Bean and Jiga tree based agroforestry which was found in only 20% surveyed family (Table 7).

Table 7: Existing agroforestry models in selected char areas of Jamalpur and Sherpur

Agroforestry models	% farmers possessing	Rank
Charland		
1. Eucalyptus in crop field Boundary	4	1
2. Vegetable cultivation in lemon orchard	3	2
Homestead		
1. Sponge gourd, turmeric and mango	5	6
2. Sponge gourd and betelnut	8	4
3. Sponge gourd and jiga	18	2
4. Bean and Jiga	20	1
5. Bean and betelnut	10	3
6. Mahogany and turmeric	6	5

4. CONCLUSION

It can be concluded from the above discussion and represented tables that the farmers of the study area were more or less literate. The farmers of the study area were not well trained and they did not know about the modern technologies of agroforestry system. Moreover, they have curiosity of modern and scientific agroforestry techniques. So, proper training, input supply and quality controlling, credit facility and extension services can be provided to upliftment of farmers livelihood and enrichment of environment and livelihood condition of the farmers.

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