Asian Journal of Advances in Agricultural Research

7(3): 1-9, 2018; Article no.AJAAR.41655
ISSN: 2456-8864

An Overview of Socio-economic and Farming Systems Status of Farmers' in the *Haor* Area under Sunamganj District

S. Ali[1*], M. A. Kashem[1] and M. A. Aziz[1]

[1]Department of Soil Science, Sylhet Agricultural University, Sylhet-3100, Bangladesh.

Authors' contributions

This work was carried out in collaboration between all authors. Author SA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors MAK and MAA managed the analyses of the study. Author SA managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAAR/2018/41655
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Complete Peer review History: http://prh.sdiarticle3.com/review-history/25959

Original Research Article

Received 25th April 2018
Accepted 12th August 2018
Published 21st August 2018

ABSTRACT

The study was carried out at Bahadurpur village under Sunamganj sadar upazila of Sunamganj district during November 2014 to July 2015 to see the socio-economic status and farming systems of the haor area. A total number of 65 farmers' were randomly selected by using random sampling technique. Data were collected from the sampled farmers' through direct interview method using a semi-structured questionnaire. Eleven farming systems were identified in the study area among them 32.31% was Crop-Poultry-Agroforestry system. The literacy rate was 44.62% which is less than the National average. Farm size was 1.29 ha. Agricultural farming was the main occupation all of the farmers'. Boro-Fallow-Fallow was the major cropping pattern in the study area. Inadequate knowledge about fertilizers application (including fertilizer dose, fertilizer application time) and low output price are main problems faced by the farmers' in haor area. Farmers' opined that the training on modern agricultural technology and proper price of farm products at farmers' level should be ensured.

**Corresponding author: E-mail: sahjahanali37@gmail.com;*

Keywords: Cropping pattern; farming systems; socio-economic status; Haor area.

1. INTRODUCTION

Haor is basin like structure where water remains either stagnant or in flash flooding condition during the months of June to November and mainly boro rice is grown in the Rabi season taking advantage of longer moisture retentivity of the soil and surface water stored in the nearby ditches [1]. There are 373 *haors* or wetland located in the districts of Sunamganj, Sylhet, Habiganj, Maulvibazar, Netrakona, Kishoreganj and Brahmanbaria. These 373 *haors* cover an area of about 859,000 ha which is around 43% of the total area of the *haor* region. It is a mosaic of wetland habitats including rivers, streams, canals, large areas of seasonally flooded cultivated plains and beels [2]. Sunamganj is a district located in north-eastern Bangladesh within the Sylhet Division. Out of these, 95 *haors* are in Sunamganj district of which about 70% area has now been turned into cultivated land. Boro-Fallow-Fallow, Fallow-B.Aman-Fallow and Fallow-Fallow-T.Aman are the major cropping patterns practiced in the area. But the ecosystem, crop production practices, economic activities and overall livelihood of the farmers of *haor* areas are quite different from those of the other parts of the country [3,4]. The present study aims to identify the status of the socio-economic and farming system of farmers' in *haor* area.

2. METHODOLOGY

The study area Bahadurpur village under Sunamganj sadar upazila of Sunamganj district is located at 25.20^0N latitude and 91.23^0E longitude. List of all farmers of the selected village was prepared with the help of local village leader and SAAO. There were 230 households are situated in the Bahadurpur village. Sample farmers were selected following a simple random sampling method. The numbers of sample farmers were 65. A semi-structured questionnaire was used as the data gathering instrument based on the objectives of the study. The questionnaire contained both open and closed form of questions. The questions in the schedule were simple, direct and easily understandable by farmers. Prior to final data collection, the fully constructed questionnaire was pre-tested in the study area in the actual field situation. The pre-test was helpful to locate faulty questions. Alternations and adjustment were made in the questionnaire on the basis of the experience of the pre-test. Based on their reactions the questionnaire was then finalized and multiplied to collect data. Researcher himself collected the data from farmers of the village through face to face interview. All possible efforts were made to explain the purpose of the study to the farmers' in order to get valid and pertinent information from them. Interviews were conducted with the farmers in their homes during their preferred time on a pre-contact basis. While starting interview with a farmer, the researcher took all possible care to establish rapport with him so that he did not feel hesitant or hostile to provide responses to the questions and statement in the questionnaire. Whenever any farmer felt difficulty in understanding any question, the researcher took most care to explain and clarify them properly. Only a single questionnaire was carried out with each farmer. The collected data were compiled, tabulated, farmers categories, means and percentage according to the objectives of the study.

3. RESULTS AND DISCUSSION

3.1 Age Distribution

The sampled farmers' were classified into three different age groups such as Below 30 years, 31-50 years, and above 51 years (Table 1). Data indicated that the largest proportion of sampled farmers' belong to average age of 41.22 years under 31-50 years age group and below 30 years age group (average age of 26.83 years) was the lowest. The sampled farmers' average age was 41.93 years. Result revealed that 78.46% of total population lies under 50 years age group which is the potential strength as human resources index of Bahadurpur village than National average by residence [5].

3.2 Farmers' Educational Level

Education is the ability of an individual to read and write or formal education received up to certain standard. There were five categories of educational levels such as illiterate, can sign only, primary, secondary and above secondary (Table 2). Those who could not put signature, read and write were considered as illiterate. Among all farmers' educational level, 16.92% of the sampled farmers' can sign only, 15.38% had education at primary level, 7.69% had education at secondary level, only 4.62% had education at above secondary level, and 55.38% of the farmer was illiterate. The literacy rate was 44.62% which is less than National average (65.6%) [5].

Table 1. Age distribution of sampled farmers' in Bahadurpur village under Sadar upazila of Sunamganj district

Age group (years)	No. of farmers' under each group	Average age (years)
Below 30	6 (9.23)	26.83
31-50	51 (78.46)	41.22
Above 51	8 (12.31)	57.75
Total	65 (100)	41.93

Figures in the parenthese indicate the percentage

Table 2. Educational qualification of sampled farmers' in Bahadurpur village under Sadar upazila of Sunamganj district

Farmers' category	No. of farmers'	Literacy level (No.)				
		Illiterate	Can sign only	Primary	Secondary	Above secondary
Landless	10 (15.38)	7 (10.77)	1 (1.54)	2 (3.08)	-	-
Marginal	16 (24.62)	8 (12.31)	2 (3.08)	3 (4.62)	2 (3.08)	1 (1.54)
Small	18 (27.69)	10 (15.38)	4 (6.15)	2 (3.08)	1 (1.54)	1 (1.54)
Medium	15 (23.08)	11 (16.92)	2 (3.08)	1 (1.54)	1 (1.54)	-
Large	6 (9.23)	-	2 (3.08)	2 (3.08)	1 (1.54)	1 (1.54)
Total	65 (100)	36 (55.38)	11 (16.92)	10 (15.38)	5 (7.69)	3 (4.62)

Figures within the parentheses indicate percentage

3.3 Farmers' Occupation

The occupation of a person is the work in which a man is engaged more or less throughout the year. Farming was found to be the primary occupation and the major source of income of all the farmers in the study area. Service, business and wage labourer were found to be the secondary occupations in the study area (Table 3). Farming was the main occupation of all farmers' (100%) because boro is significant crop in *haor* area and other options are not available.

3.4 Farm Size

The average farm size of all sampled farmers in Bahadurpur village was 1.29 ha (Table 4). There are areas of 0.05, 1.11, 0.03, 0.06, 0.19, 0.25 and 0.04 ha under homestead area, own land area, own land given to others on *borga* area, own land taken from others on *borga* area, own land given to others on lease area, own land taken from others on lease area and pond area, respectively. Data showed that average farm size of the village is higher (1.29 ha) than that of national average (0.52 ha) in Bangladesh [5].

Table 3. Occupational profile of sampled farmers' in Bahadurpur village under Sadar upazila of Sunamganj district

Farmers' category	Primary occupation (No.)	Secondary occupation (No.)		
	Farming	Service	Wage labour	Business
Landless (10)	10	-	9	-
Marginal (16)	16	3	10	-
Small (18)	18	1	8	2
Medium (15)	15	2	-	3
Large (6)	6	-	-	2
Total (65)	65	6	27	7

Figures within the parentheses indicate farmers' number

Table 4. Farm size of sampled farmers' in Bahadurpur village under Sadar upazila of Sunamganj district

(ha farm^{-1})

Farmers' category	Farm size							Average farm size
	Homestead	Own land	Own land given to others on *borga*	Own land taken from others on *borga*	Own land given to others on lease	Own land taken from others on lease	Pond area	
Landless (10)	0.01	0.05	-	-	-	0.11	-	0.17
Marginal (16)	0.03	0.19	-	0.12	-	0.17	0.01	0.52
Small (18)	0.05	0.28	-	0.11	-	0.45	-	0.89
Medium (15)	0.06	2.83	0.12	-	0.56	0.27	0.10	2.58
Large (6)	0.12	3.57	-	-	0.65	-	0.19	3.23
Total (65)	0.05	1.11	0.03	0.06	0.19	0.25	0.04	1.29

Figures within the parentheses indicate farmers' number

3.5 Annual Farm Income

Sampled farmers' annual income from sum of crop, livestock, fisheries, and non-farm and off-farm was Tk. 129482 family^{-1}year^{-1}. The farmers' total annual income in Bahadurpur village was Tk. 59399, 75520, 103321, 225142 and 229523 family^{-1}year^{-1} for landless, marginal, small, medium and large farmers' category, respectively (Table 5). The result shows that the highest annual income of large farmers' followed by medium farmers' category. Annual farm income in Bahadurpur village was Tk. 129482 family^{-1}year^{-1} which are less than rural area and National average were Tk. 160236 and Tk. 191340 family^{-1}year^{-1} due to boro is the major crop in the *haor* area [5].

3.6 Annual Expenditure

The annual expenditure of sampled farmers' family was Tk. 60507 family^{-1}year^{-1} (Table 6). Farmers' annual expenditures were Tk. 33831, 5957, 2403, 4162, 8500, 3100, 990 and 1565 family^{-1}year^{-1} for food, cloth, education, health, house manufacture, communication, entertainment and other sectors (embankment, mosque, graveyard, jalsa etc.), respectively. The result shows that farmers' expenditure on education much less for the landless and marginal farmers' categories than the small and other farmers' categories. Average annual expenditure was higher in case of large farmers', and savings of medium farmers' was higher than large and other farmers' categories. The annual expenditure of the study area was Tk. 60507 family^{-1}year^{-1} which is much less than rural area National average (Tk. 166416 family^{-1} year^{-1}) because other income sources are not available [5].

3.7 Farming Systems

There were 11 farming systems identified in the Bahadurpur village (Table 7). The highest number of farming system was Crop-Poultry-Agroforestry (32.31%) followed by Crop-Livestock-Agroforestry (29.23%). The result showed that the number of farming systems is less in the village due to low land area because boro is the major crop. In the *haor* area, most of the time the land is lied under water. So, diversity is less. The results were also supported by Islam et al. [6], Hossain et al. [7] and Hossain et al. [8].

Table 5. Farm income of sampled farmers in *haor* area in Bahadurpur village under Sadar upazila of Sunamganj district

(Tk.family^{-1}year^{-1})

Farmers' category	Total farm income				Average total income
	Crop	Livestock	Fisheries	Non-farm and off-farm	
Landless (10)	8353	14495	7050	29500	59399
Marginal (16)	27349	11964	6206	30000	75520
Small (18)	45192	16073	5611	36444	103321
Medium (15)	145351	21311	13213	45267	225142
Large (6)	177661	15796	8733	27333	229523
Total (65)	70474	16002	8022	34985	129482

Figures within the parentheses indicate farmers' number

Table 6. The annual expenditure of sampled farmers' family in *haor* area in Bahadurpur village under Sadar upazila of Sunamganj district

(Tk.family^{-1}year^{-1})

Farmers' category	Expenditure items								Average
	Food	Cloth	Education	Health	HM	CM	ETM	OS	
Landless (10)	28700	3900	1650	3100	5950	2550	650	850	47350
Marginal (16)	32625	4000	2075	3563	6550	2594	800	1069	53275
Small (18)	34111	7261	2834	4872	9178	3417	1200	1650	64523
Medium (15)	37200	6933	2467	4133	10433	2967	933	2067	67133
Large (6)	36333	8250	3083	5467	11083	4750	1570	2567	73104
Total (65)	33830	5956	2403	4162	8500	3100	990	1565	60507

Figures within the parentheses indicate farmers' number; HM= House manufacture; CM=Communication; ETM= Entertainment; OS= Other Sectors (embankment, mosque, graveyard, jalsa etc.)

Table 7. Farming systems of sampled farms in Bahadurpur village under Sadar upazila of Sunamganj district

Sl. no.	Farming systems	No. of farmers'	% of total
1	Crop-Livestock-Fish-Agroforestry	2	3.08
2	Crop-Livestock-Agroforestry	19	29.23
3	Crop-Livestock-Fish	2	3.08
4	Crop-Poultry-Agroforestry-Fish	1	1.54
5	Crop-Cattle-Fish-Agroforestry	3	4.62
6	Crop-Livestock	4	6.15
7	Crop-Poultry-Fish	3	4.62
8	Crop-Poultry-Agroforestry	21	32.31
9	Crop-Cattle-Agroforestry	1	1.54
10	Crop-Poultry	5	7.69
11	Crop-Cattle	4	6.15
Total		65	100

3.8 Cropping Pattern

There were 16 cropping patterns identified. Those are practiced by the farmers' in the Bahadurpur village (Table 8). The higher number of cropping pattern was Boro-Fallow-Fallow (100%) followed by Sweet gourd-Fallow-Fallow (18.46%) and Brinjal-Fallow-Fallow (15.38%). The result showed that the significant cropping pattern was Boro-Fallow-Fallow (100%) due to low land area because boro rice is the major crop in the study area. This finding were similar of the findings of Huda [3] and Karim et al. [4].

3.9 Problems Faced by the Farmers' Rice Field in Haor Area

There were 20 problems identified by the farmers' that are facing in *haor* area (Table 9). It was observed that the major problem among the 20 problems were low output price (100%) followed by lack of knowledge about fertilizers (including fertilizer dose, fertilizer application time) (95.38%), quality seed crisis in the sowing period (86.15%), fertilizers price high at local market (84.62%), lack of embankment around *haor* side (76.92%) and high wage rate of labour (73.85%). Khan (2004) conducted a study that found the 11 problems faced by the farmers in boro rice cultivation. The results were also supported by Halim [9] and Bhuiyan [10].

3.10 Farmers' Suggestions to Problem Solution

There were 11 suggestions given by the farmers' that are required in *haor* area for productive farming (Table 10). It was observed that most

Table 8. Cropping pattern of sampled farmers' land in Bahadurpur village under Sadar upazila of Sunamganj district

Cropping pattern	Frequency	% of respondent
Boro-Fallow-Fallow	65	100
Potato-Boro-Fallow	12	18.46
Mustard-Fallow-Fallow	05	7.69
Seedling-Coriander-Fallow	02	3.08
Sweet gourd-Fallow-Fallow	03	4.62
Radish-Fallow-Fallow	07	10.77
Seedling-amaranth-Fallow	04	6.15
Onion-Fallow-Fallow	06	9.23
Country bean-Fallow-Fallow	08	12.31
Brinjal-Fallow-Fallow	10	15.38
Tomato-Indian spinach-Fallow	02	3.08
Garlic-Fallow-Fallow	04	6.15
Ladies finger-Fallow-Fallow	03	4.62
Snake gourd-Fallow-Fallow	07	10.77
Sponge gourd-Fallow-Fallow	08	12.31
Chili-Fallow-Fallow	05	7.69

Table 9. Problems faced by the sampled farmers' to cultivation rice in *haor* area in Bahadurpur village under Sadar upazila of Sunamganj district

Sl. no.	Problem faced by the farmers'	Frequency	% of respondent
1.	Inadequate knowledge about fertilizers (including fertilizer dose, fertilizer application time)	62	95.38
2.	Quality seed crisis in the sowing period	56	86.15
3.	Farmer cannot identify good fertilizers	36	55.38
4.	Lack of adequate fertilizers supply at local market	30	46.15
5.	Fertilizers price high at local market	55	84.62
6.	Lack of embankment around *haor* side	50	76.92
7.	Lack of modern irrigation system with high irrigation cost	45	69.23
8.	Destruction of biodiversity	28	43.08
9.	Shortage of hired labour in the peak period	35	53.85
10.	Lack of capital	43	66.15
11.	High wage rate of labour	48	73.85
12.	Lack of adequate transport and communication from *haor* to farmers house	42	64.62
13.	Inadequate presence of extension agents providing the essential services	32	49.23
14.	Lack of marketing facilities for the poor agriculture producers and fishermen	20	30.77
15.	Low output price	65	100
16.	Harvesting & drying problem	35	53.85
17.	Storage problem	37	56.92
18.	Sudden flood water problem	40	61.54
19.	Very small facility of non-agricultural based employment opportunities	17	26.15
20.	Lack of adequate flood shelters	12	18.46

uttered farmers' suggestion among the 11 suggestions was profit ensured sale price of produces at farmers' level (100%) which was followed by correct fertilizer knowledge for better crop production by short term training (95.38%), provide good seed for rice production (87.69%), monitoring low fertilizer price at local market (83.08%) and provide modern irrigation system facility (76.92%). The eleven suggestions were given by the farmers to overcome the problems in producing boro rice in *haor* area. The similar result was also found by Khan [11].

Table 10. Farmers' suggestions to problem solution of the sampled farmers' rice field in *haor* area in Bahadurpur village under Sadar upazila of Sunamganj district

Sl. no.	Farmers' suggestions to problem solution	Frequency	% of respondent
1.	Provide corrects fertilizers knowledge for better crop production by short term training	62	95.38
2.	Profit ensured sale price at farmers' level	65	100
3.	Provide good seed for rice production	57	87.69
4.	Adequate fertilizers supply at local market	22	33.85
5.	Monitoring low fertilizers price at local market	54	83.08
6.	Build embankment around the *haor* side	48	73.85
7.	Provide modern irrigation system facility	50	76.92
8.	Provide marketing facilities for the poor agriculture producers and fishermen	16	24.62
9.	Provide all facility equal distribution for all farmer and control influential farmers'	18	27.69
10.	Control of biodiversity at *haor* area	25	38.46
11.	Increase facility of agricultural based employment opportunities	34	52.31

4. CONCLUSION

The *haor* regions of Bangladesh are naturally handicapped, where the whole area except the homesteads remain under flood water for about six months in a year. Therefore, unlike other parts of the country, cropping activities are totally restricted to a particular season. Farm size of the study area was higher than national average. Most of the sample farmers' are 31-50 years of age group in the study area. The highest portions of the sample farmers' are illiterate. Eleven farming systems were identified in the study among them 32.31% was Crop-Poultry-Agroforestry system. Boro rice-Fallow-Fallow is the major cropping pattern in the study area. Most of the people of the area cultivate Boro rice as the sole source of income. The sampled farmers' identified many problems that faced in rice production in *haor* area. Cent percent farmers' opined that the low output price is very critical problem. Lack of knowledge about fertilizers (including fertilizer dose, fertilizer application time) is the second most problem which was followed by quality seed crisis in the sowing period, fertilizers price high at local market and lack of embankment around *haor* side. The farmers' suggested various measures to overcome their existing problems faced by themselves. Among those suggestions, profit ensured sale price at farmers' level followed by knowledge about use of balanced fertilizers for better crop production by short-term training, provide good seed for rice production and monitoring low fertilizer price at local market, provide modern irrigation system facility at local market and provide modern irrigation system facility and build embankment around the *haor* side were the most pronounced.

CONSENT

As per international standard or university standard written participant consent has been collected and preserved by the authors.

DISCLAIMER

This paper is based on direct interview method using a semi-structured questionnaire. Readers are requested to consider this paper as preliminary research article, as authors wanted to publish the initial data as early as possible. Authors are aware that detailed statistical analysis is required to get a scientifically established conclusion. Readers are requested to use the conclusion of this paper judiciously as statistical analysis is absent. Authors also recommend detailed statistical analysis for similar future studies.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
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