



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2017; 3(6): 457-462
www.allresearchjournal.com
Received: 21-04-2017
Accepted: 23-05-2017

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Base line survey for farmer livelihood improvement at farming system research and development, Gauripur, Mymensingh of Bangladesh, India

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Abstract

To get an idea about the existing farming practices of the farmers of the site a base line survey was undertaken. This survey covered crop, livestock, fisheries, homestead, and agro forestry with data pertaining to 50 farmers from the three villages of Gouripur Upazila, Mymensingh. The data refers to the input & output details and other socio-economic characteristics of farm households in the crop year 2011-2012. Data were collected by using simple random sampling technique. The result of the baseline survey showed that out of 50 sample farmers landless (less than 0.02 ha), marginal (0.021 ha to 0.2 ha), small (0.21 ha to 1 ha), medium (less than 3 ha) and large (above 3 ha) farmer were 3, 7, 22, 14 and 4, respectively. Four types of major farming systems exist in the Farming System Research and Development (FSRD) site. Among the farming systems in the study area maximum sample farmers (15 farmers) practiced the farming system (Crop + Livestock + Poultry + Fisheries) which were about 30 percent among the farmers. The main cropping pattern in the site was Boro-fallow-*T. Aman*, Fallow-Fallow- *T. Aman*, Vegetable-Fallow- *T. Aman*. Out of three cropping patterns, net return was the highest in Boro-fallow-*T. Aman*, (Tk.50635 ha⁻¹) followed by Fallow- Fallow- *T. Aman* (Tk.15165.8 ha⁻¹), Vegetable- Fallow- *T. Aman* (Tk.7691 ha⁻¹). On an average per farm total net return were from livestock Tk.17270 and from poultry Tk. 564 for the year 2011-2012 and tilapia farming net return was Tk. 47800. Income generating activities of the site was crop, livestock, fisheries, poultry, and off-farm and non-farm activities. Off-farm income was higher compared to farm income in case of landless farmer. On the other side farm income was higher compared to non-farm income for the small, medium and large farm. In the site farmers had several problems in there farming practices such as, lack of knowledge about new crop variety/technology, quality seeds / fingerlings / duck links, credit facilities, feed of fish, livestock and poultry and Lack of knowledge about homestead vegetables production etc.

Keywords: Livelihood, Farming System, Fisheries, Crop and Livestock

1. Introduction

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 "Coordinated Subproject on Farming System Research and Development for Farmers Livelihood Improvement".

Over the last two decades, rural livelihoods research methods have changed considerably (Ellis 2000) [4]. During the 1980s, there was a move away from extensive questionnaire surveys, regarded by some as time-consuming, costly and ineffective (Chambers 1983) [2]. To participatory techniques, such as rapid rural appraisal (RRA) and participatory rural appraisal (PRA) that were seen to be more efficient, economical and bottom-up (Chambers 1983) [2]. PRA techniques have now become widely accepted tools in conservation and development research. They are now often the only methods used by researchers in this field because of short project cycles and tight budgets. It can be argued, however, that when used in isolation they provide little insight into people's livelihoods and limited understanding of the broader socio-economic, political and historical processes that impact on rural people and influence land-use management practices (Sharpe 1998; Burnham 2000; Malleon 2000) [6]. Freshwater fish farming plays an important role in the livelihoods of rural people in Bangladesh (Mazid, 2002) [8].

It creates diverse livelihood opportunities for a number of people, many of whom living below the poverty level. Mamun *et al.* (2011) [7]. Explored the linkages of components in the farming system to enhance the farm productivity, reduce the environmental degradation, improve the quality of life for poor farmers and to maintain sustainability. The access arrangement and assessments of benefits to livelihood is particularly important as a social content (Hasan *et al.* 2012) [5].

There are various types of data like as, primary data, secondary data etc. Data were collected according to the objectives of the survey. There are various methods of collecting data in farming system research. Selection of particular method depends on many considerations such as the nature of the research problem, provision of research funds, time constraints, available literature as well as information at primary and secondary level. Collection of data for farms survey analysis involves compromises and the judgment of the analyst in the selection of data collection methods within the limits imposed by the resources available for the work (Dillon and Hardaker, 1993) [3].

Bangladesh is one of the developing countries with highest population density, of which 50 percent under poverty level, 70 percent under nourished and a vast population unemployed. The homestead of rural Bangladesh are generally underutilized or crowded with unproductive spaces. In spite of agricultural country the people are lack in production and consumption of fibrous food with a ratio of cereal and fibre at 5:1. Majority of the population are lack in required amount of vitamins, minerals and protein. About 15 million of homestead is there in the country which can help producing sufficient vegetables and fruits for the concerned families.

2. Materials and Methods

The present study on the Socio-economic and Livelihood status of Farming System Research and Development site, Gauripur, Mymensingh of Bangladesh. The primary data needed for the study were collected through the survey method by detailed questionnaires. This survey on the investigation of study areas covered crop, livestock, fisheries, homestead, and agro forestry with data pertaining to 50 farmers from the three villages of Gouripur Upazila, Mymensingh

2.1. Study Area and Period

The Gouripur Upazila of Mymensingh district was the selected as study area. Gauripur is located at 24°45'30"N90°34'30"E. This study was carried out in the crop year 2011-2012.

2.2. Data Collection:

An interview schedule has been made for data collection. There are 50 sample farmers were taken for data collection from three villages namely douhakhola, kadim douhakhola and singani of Gouripur Upazila of Mymensingh district for base line survey of farming systems research development project.

2.3. Sampling method

The survey programme was carried on the farming system of Gouripur Upazila of Mymensingh district. Samples were taken by Using random sampling technique method

2.4. Data Analysis

After data collection each interview schedule was verified for consistency. Before putting the data in the computer data were edited according to the necessary units. 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. Result and discussions

In this study, the livelihood and socioeconomic status of farmers was the main aspect emphasizing on educational status, occupational status, family size, family type, housing condition, different farming system including crop, livestock, fisheries, poultry off-farm and non-farm, credit access, income and other socioeconomic issues. A total of 50 farmers were interviewed at three villages of Gauripur Upazila of Mymensingh on various aspects of livelihood status of the farmer. A detailed analysis was made on the following parameters and presented in this section. Age, literacy and farm size have important impact on decision making processes of agricultural production. These help a person to make right decision regarding his farm business and to obtain new information of various production processes.

3.1. Age Distribution, Literacy Level and Farm Category of Selected Farmers

The result of the baseline survey showed that the average age of landless (57 years) higher than others farmer. The younger farmers have more technically efficiency than the older farmers and a younger farmer can easily adopt new technology and thereby increase his efficiency (Battese & Coelli, 1995) [1]. Table 1 also shows that farmers of all categories were not highly educated. Most of them were educated up to class 5. Table shows the Landless and medium farmers have comparatively higher family size than other categories of the farmers and average farm size of the landless farmers was 0 decimal and large farmers average farm size was 860.00 decimal.

Table 1: Average age, educational level, Family Composition and Farm Size:

Farmer category	Age (year)	Educational level (%)					Family size (no.)	Farm size (decimal)	Number of sample farmers
		Illiterate	Class V	S.S.C	H.S.C	>H.S.C			
Landless	57	33.33	66.67	-	-	-	6.3	0	3
Marginal	47	14.29	85.71	-	-	-	4.7	44.28	7
Small	44	18.18	68.18	4.55	9.09	-	4.6	157.27	22
Medium	48	-	28.58	57.14	7.14	7.14	6.3	346.07	14
Large	55	-	50.00	50.00	-	-	5.2	860.00	4

3.2. Major Farming Systems Followed by the Sample Farmers

Maximum sample farmers practiced the farming system (Crop + Livestock + Poultry + Fisheries). There were no

farmers who practiced only agro-forestry, orchard and nursery (Table 2).

Table 2: Major farming systems of the sample farmers

Major Farming Systems	No. of Households	Percentage (%)
Crops	1	2
Crop + Livestock + Fisheries + Poultry	15	30
Crop + Livestock + Poultry	3	6
Crop + Livestock	2	4
Crop + Livestock + Fisheries	5	10
Crop + Fisheries + Poultry	3	6
Crop + Poultry	1	2
Crop + Fisheries	11	22
Livestock + Fisheries + Poultry	2	4
Livestock + Poultry	1	2
Fisheries + Poultry	3	6
Livestock + Fisheries	3	6
Total	50	100

3.3. Major Growing Crops in the Study Area

Table 3 shows that yield of Boro per hector was higher than yield of Aman per hector. In the study area farmers grows only paddy. They were not introducing themselves as a vegetable growers as a commercial basis. Only some of them produced vegetables for their own family requirements. Farmers grow mainly Aman and Boro rice.

Table 3 shows that, Aman were produced on 45.427 ha of land. Average yield of Aman production were 2964 kg per ha. Boro were produced on 49.427 ha of land. Average yield of Boro production were 5928 kg per ha. Table 3 shows that yield of Boro per hector was higher than yield of Aman per hector.

Table 3: Major crops grown by sample

Crops	HYV		LOCAL		Sowing/Planting time Range (from – to)	Harvesting time Range (from – to)	
	Area (ha)	Yield (kg/ha)	Area (ha)	Yield (kg/ha)			
Rice	DSR (Aus)	-	-	-	-	-	
	T. Aus	-	-	-	-	-	
	T.Aman	-	-	45.427	2964	July-August	November-December
	Boro	49.427	5928	-	-	November-December	March-April
Potato	0.5	20-25 ton	-	-	November- December	February-March	

3.4. Cropping Patterns Practiced by the Sample Farmers

Farmers grow mainly Aman and Boro rice. Kironmala, Mukta and BR 21 were the common variety of aman rice which the farmer grows. Main variety of Boro rice which

farmer grows was BRRi dhan 28, BRRi dhan 29, Gazi and hybrid rice (Table-4).

Table 4: Major cropping patterns practiced by the farmers

Acreage (ha)	Cropping patterns and variety in different seasons					
	Kharif-1		Kharif-2		Robi	
	Crop	Variety	Crop	Variety	Crop	Variety
Boro-fallow-T. Aman			T. Aman	Kironmala, Mukta, BR 21	Boro.Rice	BRR Idhan28,BRRIdhan 29
Fallow- Fallow-T. Aman			T. Aman	Kironmala, Mukta, BR 21		
Vegetable-Fallow-T. Aman			T. Aman	Kironmala, Mukta, BR 21	Potato, Bottle gourd, Bean, Cauliflower, Cabbage	Local, Imported

3.5. Average per Farm Input Used by the Sample Farmer

The average per farm input use for crop production of the sample farmers are shown in the Table-5.

Table 5: Average per farm input use for crop production of the sample farmers

Name of crops	Input use (no. or kg/ha)										Total input cost (Tk/ha)	Tillage cost (Tk/ha)
	Labor (Male+ Female)	Seed	Urea	TSP	MP	ZnSO ₄	Gypsum	Cow dung	Insecticide (Tk)	Irrigation (Tk)		
Aman	15	50	98.8	50	50	-	-	-	1482	1235	13843	4446
Boro	25	37	296	74	74	-	74	-	4446	11115	34243	4446
Potato	15	1500	250	120	220	8	120	10	1318	1235		1300

3.6. Per Farm Fruit Production and Disposal

Average per farm homestead fruit production and disposal pattern are shown by the Table 6. Mango was produced on an average 120 kg per homestead. Farmers consumed about 40 kg on average and sold about 80 kg on average. Market price of the mango per kg was tk. 40 on average at harvesting time. There were some banana productions on

the homestead area. On average total number of banana produced per homestead area are 100. Farmers consumed on average 40 bananas and sold on average 60 bananas. Value of per banana at harvesting time was tk. There were also some papaya and guava production in the site. Average production of papaya per households was 20 kg and average production of guava per households was 4 kg only.

Table 6: Average per farm homestead fruit production and disposal pattern

Name of fruits	Total fruits produced (no. or kg)	Fruits consumed (no. or kg)	Fruits sold (no. or kg)	Fruits distributed to others (no. or kg)	Value of fruit (Tk/fruit /kg)	Market price of fruit at harvest (Tk./ pice/kg)	Total value of fruits (Tk.)
Mango	120 kg	40 kg	80 kg	-	40	40	4800
Jackfruit	4	4	-	-	60	60	240
Banana	100	40	60	-	4	4	400
Papaya	20	12	8	-	20	20	400
Guava	4	4	-	-	40	-	160

3.7. Per Farm Cost and Return of Livestock and Poultry

It was revealed from the survey at the site that farmers were rearing cow, ox, bullock and goat. The housing pattern for the cattle was not developed Table 7 shows the average per farm cost and return of livestock and poultry enterprise of the sample farmers of 2011-12. In the site farmers feed their cattle mainly green grass, rice bran, straw, oil cake etc. and

feed their poultry rice, rice bran etc. Table 7 shows that, farmer spent about Tk. 2500. Per year as feed cost per cow, Tk. 3285 per year per ox and Tk. 1560 per year for per calf and Tk. 885 per year for per goat. Net return get by the farmer was on average Tk. 5500 per cow, Tk. 6715 per ox and Tk. 3940 per calf and Tk. 1115 per goat. These means rearing livestock was profitable for the sample farmers.

Table 7: Average per farm cost and return of livestock and poultry

Livestock/poultry	Average Number (present)	Original value (Tk./animal) (1)	Feed cost (Tk./animal) (2)	Present value (Tk./animal) (3)	Total cost (Tk./animal) (1+2)=4	Net Return (Tk./animal) (3-4)
Livestock						
Cow	1.34	15800	2500	23800	18300	5500
Ox	0.94	20300	3285	30300	23585	6715
Goat	0.98	3125	885	5125	4010	1115
Calf	0.86	6500	1560	12000	8060	3940
Total		45725	8230	71225	53955	17270
Poultry						
Chicken	3.98	50	75	250	125	125
Duck	3.24	150	85	390	235	155
Hen	2.27	300	100	600	400	200
Pigeon	0.32	100	66	250	166	84
Total		600	326	1490	926	564

3.8. Per Farm Cost and Return of Fish Culture

Fish culture was also an age old practice in the site where baseline survey was conducted. About 100 percent of the households who had pond engaged with fish culture. But most of them practiced traditional methods for fish culture. The common fish species were native species like rui, katla, mrigal, tilapia, shing etc. Table 8 shows the per farm cost and return of fish culture of the sample farmers. Farmers used oil cake, lime, cowdung, mixed feed, etc. for fish culture. For tilapia culture in a pond on an average of 20

decimal farmers bears Tk. 20125.5 as a production cost. Farmers get on average Tk. 57600 as a gross return. And net return get by the farmers by tilapia culture was Tk. 37474.5. So it is profitable. Most of the farmers in the site culture native species. For culturing native species in a pond on an average of 32 decimal farmers bears Tk. 30200 as a production cost. Farmers get on average Tk. 78000 as a gross return. And net return get by the farmers by culturing native species was tk. 47800. So it is also more profitable for the farmers.

Table 8: Per farm cost and return of fish culture

Name of fish	Number of fishes	Area (decimal)	Production (kg)	Production cost (Tk.)	Gross return (Tk.)	Net return (Tk.)
Tilapia	5760	20	480	20125.5	57600	37474.5
Others (Native sp.)	6012	32	650	30200	78000	47800
Total	11772	52	1130	50325.5	135600	85274.5

*Farm gate price of fish: 120 (Tk/kg)

3.9. Cost and Return of Major Cropping Patterns

Table 9 shows the cost and return of major existing cropping patterns in the site. The farmers of the site where baseline survey was conducted produced only Aman and Boro. For

the cropping pattern Boro-fallow-T. Aman which existing in the site total cost were 56810 and gross return from this cropping pattern were Tk. 107445 and BCR was 1.89. Few of the farmers practiced cropping pattern Fallow-Fallow-T.

Aman. Benefit cost Ratio (BCR) of this cropping pattern was 1.83. Few of the farmers practiced cropping pattern

Vegetable-Fallow-T. Aman. Benefit cost Ratio (BCR) of this cropping pattern was 1.36.

Table 9: Cost and return of major existing cropping patterns

Cropping Patterns	Total cost (TC) (Tk./ha)	Gross Return (GR) (Tk./ha)	Net Return (NR) (Tk./ha)	BCR (GR/TC)
Boro-fallow-T. Aman	56810	107445	50635	1.89
Fallow- Fallow- T. Aman	18179.2	33345	15165.8	1.83
Vegetable-Fallow-T. Aman	21635	29326	7691	1.36

3.10. Average per Household Livestock and Poultry Assets

The average per household livestock and poultry assets of sample farmers are shown in Table-10.

Table 10: Average per household livestock and poultry assets (no.) of sample farmers

Assets	Landless	Marginal	Small	Medium	Large
Ox	-	1	1	1	1
Cow	2	1	1	2	1
Calf	1	-	1	1	1
Goat	2	1	1	1	-
Chicken	11	8	3	2	4
Duck	4	6	2	4	2

3.11. Average per Farm Income of the Sample Farmers

Table 11 shows that, landless farmers earning source was rearing livestock, rearing poultry and off-farm and non-farm activities. Total income of the landless farmers on an

average was tk. 66580 per year. Major portion of their income earned by off-farm activities like labor selling, rickshaw polling etc. Major portion of the income of medium and large farmers comes from crops

Table 11: Average per farm income (Tk.) of the sample farmers

Item	Landless	Marginal	Small	Medium	Large
Crop	-	0	22011.36	89053.57	205375
Livestock	20500	18800	16700	17680	24600
Fisheries	-	41942	93352.4	83028.57	78000
Poultry	5000	5000	3500	6750	-
Off-farm	26080	30720	22050	25000	15000
Non-farm	15000	15000	10475	-	-
Total	66580	111462	168088.76	221512.14	322975

3.12. Average per Farm Expenditure of the Sample Farmers

Average per farm expenditure of the sample farmers are shown by Table 12. Landless farmers spent their Major portion on food. Small, Medium and Large all categories of the farmers spent their major portion for farming practices.

Medium and Large farmers spent a good amount for the education of their children.

3.13. Problem Faced by the Farmers

Farmers of the study area faced various types of problems on their farming practices. These problems were summarized by the following Table 12.

Table 12: Problems faced by the farmers in the study areas

Problems	% farmers suggested	Solution(s)
Lack of knowledge about new crop variety/technology	60	Providing Training facilities
Lack of quality seeds / fingerlings / duck links	70	supply of quality seed/fingerlings
Lack of credit facilities	48	Providing credit facilities
Lack of knowledge about fish feed and pond management	96	Providing training facilities
Lack of knowledge about vaccination, de worming, feed of livestock and poultry	98	Providing training facilities
Lack of knowledge about homestead vegetables production	84	Providing training facilities
Lack of transportation facilities	90	should improve transportation facilities
Cultivated lands are not sufficient	30	Require Lease in Lease out land facilities.
lack of medical facilities for livestock	82	need veterinary clinic

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. Their farm sizes were small. The farmers of the study area were containing small and medium family size. Farmers of the site faced many problems, like lack of knowledge about new crop variety, new technology,

lack of credit facilities, lack of knowledge about fish feed and pond management, lack of knowledge about vaccination, de warming and feed of livestock and poultry, lack of transportation facilities etc. It should require taking necessary steps to remove these problems However, the farmers of the study area were not well trained and they did not know about the modern technologies of farming.

Moreover, they have curiosity of modern and scientific farming. So, proper training, input supply and quality controlling, credit facility and extension services can be provided to improve the socioeconomic and livelihood condition of the farmers.

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