SOCIO-ECONOMIC STATUS OF BUFFALO FARMERS AND MANAGEMENT PRACTICES OF BUFFALOES AT SHAHJADPUR MILK POCKET AREA IN BANGLADESH

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ABSTRACT: *Buffalo is the most neglected species of large ruminant, despite contributing to safe and sustainable milk and meat production in Bangladesh. A survey was conducted at five unions of Shahjadpur upazilla under Sirajganj district which is called the milk pocket area in Bangladesh. The objective of the survey was to find out the socio-economic condition of buffalo farmers in these areas. Prior to conducting the survey work from February to June 2024, a questionnaire was designed and pre-tested. SPSS software was used to statistically analyse the collected data. The results revealed that the majority (84%) of buffalo farmers were male and mostly (72%) practised by middle-aged (30-45 years). The education level of farmers had no schooling (12%), primary (50%), secondary (22%), higher secondary (16%) and graduation (0%), respectively. In the survey area, a majority (76%) of the farmers reared young male (1.5 to 2 years) buffalo for fattening. Additionally, 72% of farmers raised buffaloes with intensive systems and the remaining 28% with semi-intensive. The involvement of respondents in farming, business and others were 84, 8% and 8% respectively. Most (60%) of the farmers dewormed their buffalo regularly but only 28% practised regular vaccination. The main factors limiting buffalo production in the study locations were the high price of concentrate feed (88%), lack of pond for wallowing (70%), lack of improved dairy buffalo breeds (60%), lack of green fodder (30%), unavailability of bank loan (18%) and training facility (24%). The net income from fattening one buffalo per half yearly was BDT 26713. It indicates that rearing buffaloes for fattening purposes in the selected areas was profitable.*

KEYWORDS: Buffalo, rearing system, socio-economic condition, management practices.

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INTRODUCTION

Livestock, a key component of agriculture contributes about 3.23% to national GDP and more than 6% of total foreign exchange earnings in Bangladesh (DLS, 2022). Buffalo (*Bubalus bubalis*) is the most valuable livestock species and holds a strategic place next to cattle in Bangladesh's overall livestock economy. Buffalo produce roughly 1.4% milk of national demand and 0.95% meat (Hamid *et al.,* 2016; Siddiky & Faruque, 2017). In Bangladesh, about 1.5 million buffaloes are of indigenous origin, and the country is home to both swamp and river varieties (Hamid *et al.,* 2016; DLS, 2022) whereas 40% are spread over the coastal regions. As Costal and Hilly areas contain large-scale pasture land and available green grass, buffaloes are more comfortable in extensive systems in these areas. Buffaloes are familiar with their disease resistance, higher capacity of converting coarse feed stuff into quality milk and meat, better draught capacity and adaptability to adverse climatic conditions in Bangladesh.

Despite many important roles of buffalo in the people's livelihood, buffaloes are a neglected species and are not getting much importance in our country (Rahman *et al.* 2019). There are several published reports regarding farmers socio-economic profile and management practices of buffaloes (Sarkar *et al.,* 2013; Amin *et al.,* 2015; Hasan *et al.,* 2016; Uddin *et al.,* 2016; Rahim *et al*., 2018; Kabir *et al*., 2020) in various regions of Bangladesh. There are about 1200 acres of Bathan land at Shahjadpur upazila of Sirajganj district. Around 4 to 5 lakh metric tons of raw milk is produced daily from this area. No study has been performed on the socio-economic profile of buffalo farmer and the contribution of their buffaloes to milk production in this milk pocket area. Therefore, the present study was undertaken to obtain first-hand information on the socio-economic characteristics of buffalo keepers and existing buffalo management practices being followed by the buffalo keepers in selected milk pocket areas of Sirajganj district along with cost-benefit analysis and livelihood changes of farmers towards buffalo rearing.

MATERIALS AND METHODS

Location of the survey area

The survey was conducted at five unions namely Potajia, Rupabati, Porjana, Gala and Paurashava of Shahjadpur upazila of Sirajganj district in Bangladesh (**Fig-1**). All five unions are around the Bangladesh Milk Producers Co-operative Union Limited (Milk-Vita) which is located in the town of Baghabari of Potajia union of Shahjadpur upazila.
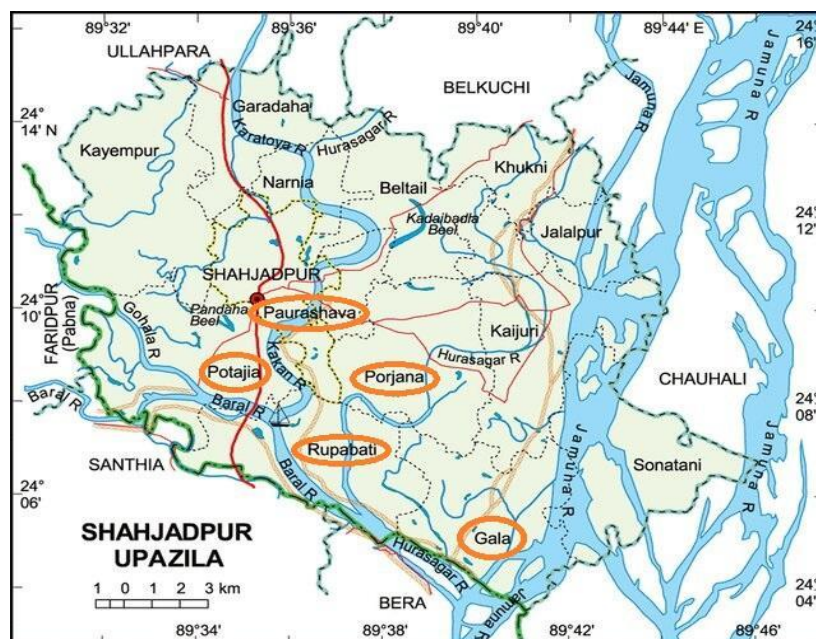

Figure 1: Location of study

Farmer selection

Farmers who had at least one buffalo were selected for this study. A total of 50 farmers from different villages of five unions namely Potajia (19), Rupabati (15), Porjana (05), Gala (07), and Paurashava (04) were selected. Proportional Probability Random Sampling (PPRS) techniques of Lahiri (Snedecor and Cochrane, 1989) were used for farmer selection.

Preparation of interview schedule and data collection

A structured questionnaire was carefully prepared based on the objectives of the study. The questionnaire was simple and easily understandable by the respondents. Before the survey, the draft questionnaire was pre-tested in the selected areas and modified accordingly. Data were collected during the period of April to June 2024 through face-to-face interviews with individual buffalo farmers. A very easy and simple manner was used during asking questions to farmers. Questions were asked twice or thrice to the farmer with explanations for well understanding. The selected variables were socioeconomic profiles of buffalo owners, feeding, housing and management system of buffaloes, benefit-cost ratio, farmer's problems and suggestions to increase buffalo production in the study areas.

Statistical analysis of data

At the end of the survey, data were carefully tabulated and analyzed with simple statistical methods to fulfil the objectives of the study. The collected data were first transferred to master sheets and compiled to facilitate the needed tabulation. The tabular technique was applied for the analysis of data using simple statistical tools like averages and percentages through the SPSS-v-26 computer package program.

RESULTS AND DISCUSSION

Socio-economic condition of farmers

Table 1 depicts the socio-economic condition of buffalo farmers in the study area. About 72% of the buffalo farmers in the study areas were middle-aged (31 - 45 years) while old aged (> 45 years) and young aged (up to 30 years) comprised 18% and 10%, respectively. This result is consistent with Rahim *et al.* (2018), who found that most of the farmers were middle-aged categories (47%). Kabir *et al.* (2020) reported that buffalo rearing was practised by farmers (47.5%) in the age group of 31 to 45 years in coastal regions of Bangladesh. In the study area, most of the buffalo farmers (84%) were male as they showed dominant character in our society. In the case of family size, small (0-4) and medium (5-6) families showed almost equal portions and their percentages were 46% and 48%, respectively. Almost half (50%) of the farmers were educated at the primary level while the percentage at the secondary level was 22%. A majority (84%) of the farmers were involved in agriculture with livestock rearing. Almost half (48%) farmers had short-term experience in rearing buffalo between 1 to 3 years. 30% of the buffalo farmers had 4 to 5 years of rearing experience.

Table 1. Socio-economic condition of buffalo farmers (n=50)

Parameters	Categories	Number of respondents	Percent of total respondents
Age	Young age (up to 30 years)	5	10
	Middle age (31-45 years)	36	72
	Old age (>45 years)	9	18
Sex	Male	42	84
	Female	8	16
Household size	Small family (up to 4 members)	23	46
	Medium family (5-6 members)	24	48
	Large family (above 6 members)	3	6
Educational status	Illiterate	6	12
	Primary	25	50
	Secondary	11	22
	Higher Secondary	8	16
	Honours	00	00
Occupation	Agriculture	42	84
	Businessman	4	8
	Others	4	8
	(1-3) years	24	48

Experience of rearing	(4-5) years	15	30
	(6-10) years	9	18
	Above 10 years	2	4

Type and source of buffalo

Table 2 shows the types and sources of buffalo reared in the study area. All of the buffalo reared in this study area were indigenous type. This result is consistent with Rahim *et al.* (2018), who found the same result in the plain land of Subornachar upazila in Bangladesh. The majority (96%) of the farmers purchased buffalo directly from the local market. Most (76%) of the buffalo farmers reared male buffaloes between the age of 1.5 to 2 years for fattening purposes. Likewise, 10% of female buffalo are between 1.5 to 2 years old but only 14 % of farmers reared dairy buffalo.

Table 2. Distribution of respondents according to types and source of buffalo (n=50)

Parameters	Categories	Number of respondents	Percent of total respondents
Type of buffalo	Indigenous	50	100
	Crossbred	0	00
According to Buffalo Demography	Dairy buffalo	7	14
	Female buffalo (1.5 to 2 years)	5	10
	Male buffalo (1.5to 2 years)	38	76
Source of buffalo	Own source	2	4
	Purchase	48	96

Buffalo housing, rearing system and purpose of rearing

Results from **Table 3** show that the majority (60%) of buffalo farmers used tin shed-type housing followed by half of the buildings (32%). About 72% of the farmer-reared buffalo in an intensive system followed by a semi-intensive (28%) and no extensive system in the study area. This result shows dissimilarity with Sarkar *et al.* (2013) who reported that a semi-intensive feeding system was practised in the Bagerhat district followed by an extensive system but no one practised an intensive feeding system. Though the study area was rich in milk production and produced 4 to 5 lakh metric tons of milk per day, the majority (70%) of buffalo farmers reared buffalo for fattening purposes. Furthermore, 12% of buffalo owners reared for meat and hobby followed by 8% for dual purposes and 6% for milking purposes. Only 4% of farmers used buffalo for drought and meat purposes. Most of the buffalo farmers in the study area reared buffalo for a short duration between 3 to 6 months for fattening.

Table 3. Distribution of respondents according to buffalo housing status, rearing system and purpose of rearing (n=50)

Parameters	Categories	Number of respondents	Percent of total respondents
Housing status	Building	4	8
	Half-building	16	32
	Tin shed	30	60
Buffalo rearing system	Intensive	36	72
	Semi-intensive	14	28
	Extensive	00	00
Purpose of rearing	Only Meat	35	70
	Only Milk	3	6
	Meat and milk	4	8
	Meat and draught	2	4
	Meat and hobby	6	12

Feeding and management

Feeding of buffalo in the study area is given in **Table 4**. All farmers supplied rice straw and cultivated fodder as roughage. Normally they cultivate Jambbo and Matikalai as mixed cropping and high-yielding Napier separately. The interesting thing is that the maximum lands in the study area were submersed with water for four months. At this time, farmers used only straw as roughage. All farmers used wheat bran and rice polish in a concentrate mixer. About 93% of buffalo farmers used broken rice and oil cake and 26% of farmers used pulse bran in a concentrate mixer. Only 23% of farmers used vitamins and minerals during concentrate mixing. They supplied the entire concentrate mixer twice a day ad libitum drinking water.

Table 4. Feeding of male buffalo for fattening purposes (n=30)

Parameters	Categories	Number of respondents	Percent of total respondents
Roughage	Rice straw	30	100
	Cultivated fodder	30	100
Concentrate	Wheat bran	30	100
	Rice polish	30	100
	Broken rice	28	93
	Pulse bran	8	26
	Oil cake	28	93
	Vitamin mineral supplement	7	23

Health care status of buffalo

In the study area, about 28% of buffalo farmers were vaccinated regularly but the majority (72%) did not vaccinate their buffalo regularly (**Figure 2**). A maximum number (60%) of farmers practised de-worming buffalo regularly whereas 40% were not interested in giving any anthelmintics to their buffaloes. However, only (8%) of farmers used medicine for treatment that indicated that buffaloes were more resistant to disease. As the majority of the farmers reared young buffalo for fattening purposes, they were more resistant than other types of buffalo.
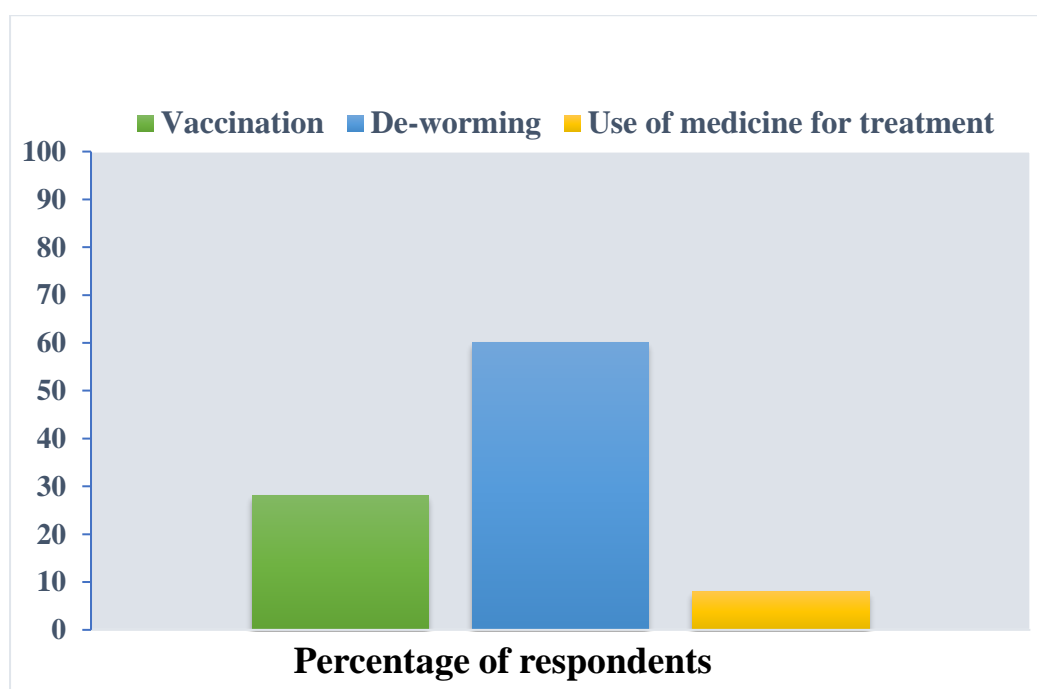

Figure 2: Health care of buffalo (n=50)

Cost-benefit analysis

Cost-benefit analysis of buffalo farmers who rear for fattening purposes is given in **Table 5**. Though the study area is dominant in milk production, most of the buffalo farmers rear buffalo for meat purposes along with dairy cows. Short-term (3-6 months) fattening of buffalo became more popular in this area. They purchased young buffalo from the local market with an average of BDT 83,090.00. Young male buffaloes were preferable to farmers. The average cost of concentrate mixer per buffalo was around BDT 26,325.00. They supplied rice straw for 4 months and cultivated fodder specially Jambbo, Matikalai and Napier for 2 months and the average cost of rice straw and cultivated fodder per buffalo were BDT 13,248.00 and BDT 9,390.00 respectively. The average cost of vaccination and deworming was BDT 250.00 and BDT 300.00 respectively. The total cost per buffalo from purchase to 6 months of rearing was BDT 1,33,603.00. After fattening they sold them in the local market. The average selling price per buffalo was BDT 1,59,316.00. No labour was used in this fattening program as they reared themselves. In this short-term fattening program, they earned around BDT 25,713.00 per

buffalo. It indicates that the rearing of buffaloes in the selected areas as a fattening purpose was profitable.

Table 5. Cost-benefit analysis of buffalo farmers rearing for fattening purposes (n=30)

Parameters	Amount of feed (kg) buffalo/day (mean±SD)	Average Cost Tk./ kg	Total cost Tk./ 6 months
Cost per buffalo			
Average price (Age- 1.5 – 2 years)	(83,090 ± 6,755.34)		83,090.00/-
Rice straw (for 4 months)	(9.2 ± 1.66)	12/-	13,248.00/-
Cultivated fodder (For 2 months)	(31.3 ± 5.52)	5/-	9,390.00/-
Concentrate mix	(3.25 ± 0.60)	45/-	26,325.00/-
Vaccination	-	-	250.00/-
De-worming	-	-	300.00/-
Treatment cost	-	-	1000/-
Labour	Own source	-	-
Total			=1,33,603.00/-
Average selling price per buffalo	(1,59,316.7 ± 15,010.62)		=1,59316.00/-
Net Profit			= 25,713.00/-

Problems and suggestions

High cost of feed, lack of a pond, lack of dairy buffalo breed, lack of fodder, lack of training facility and unavailability of bank loan were the main problems addressed by 88%, 70%, 60%, 30%, 24% and 18% of buffalo farmers respectively in the study area (**Table 6**). The high price of concentrate feed not only affected the farming of buffalo but also the cattle farming in the study area. Most of the farmers opinioned that like cattle, buffalo did not have any high-yielding dairy breed for this reason they were less interested in rearing buffalo. In the study area, there was a huge bathan land but it submersed with water for around 4 months. Within this period, farmers didn't supply any fodder. To solve those problems, farmers had some suggestions. Lowering the price of concentrate feed, providing high-yielding dairy buffalo breed, availability of banks, loans or subsidies and more training facilities were the suggestions by 88%, 60%, 86% and 62% of farmers, respectively.

Table 6. Problems and suggestions of buffalo rearing (n=50)

Problems	Number of respondents	Percent of total respondents
Lack of pond	35	70
Lack of dairy breed of buffalo	30	60
High feed price	44	88
Lack of available fodder	15	30
Lack of training facilities for buffalo rearing	12	24

Unavailability of bank or NGO loan facility	9	18
Suggestions to improve problems		
Lowering the price of concentrate	44	88
Providing high-yielding dairy buffalo breed-like cattle	30	60
Availability of bank loan or subsidy	43	86
Provide more training facility	31	62

CONCLUSION

It can be concluded that the majority of the farmers in the study area reared young buffalo for short-term fattening purposes. Usually, they are reared in an intensive system. Though the study area was a dairy zone, they preferred high-yielding cows for dairying rather than buffalo. The unavailability of high-yielding dairy buffalo breeds was the main obstacle to profitable dairying of buffalo in this area. Therefore, it is high time to do more research on different aspects of buffalo rearing in specific areas in Bangladesh.

Data Availability

Data are contained within the article.

Conflict of interest

There is nothing to declare.

Authors' contribution

Conceptualisation: Mohammed Sirajul Islam; Development of the interview schedule, Surveying and computerisation of data: Mohammed Sirajul Islam, Ummeya Shiha Alam, Al-Amin Hossain, Md. Tarikul Islam and Humayra Siddika; Writing-original draft preparation: Ummeya Shiha Alam, Al-amin Hossain and Md. Tarikul Islam; Writing-review and editing: Ummeya Shiha Alam and Mohammed Sirajul Islam; Supervision: Mohammed Sirajul Islam. All authors have read and approved the final manuscript.

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