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CAUSES AND CONSEQUENCES OF LIVESTOCK REARING DURING THE FALLOW PERIOD OF CROP PRODUCTION

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Abstract

There are a few compelling issues that make the coastal dwellers to accept livestock rearing as an alternative means of livelihood. The study examined the causes and consequences of livestock farming during the fallow period of crop production as perceived by the farmers. Data were collected from 111 villagers of Assasuni upazila of Satkhira district from May 08 to December 23, 2021. Respondents' perceptions regarding the causes and consequences of livestock rearing were the focus variable and the thirteen selected characteristics of the respondents were the independent issues. All the respondents (100%) had clear perception about the causes. 'Paddy was cultivated once a year and the land remains fallow during rest of the times' was the leading cause (1st ranked, 98.37%) of livestock rearing. Almost all of the respondents (98.2%) had high score on perception of consequences. 'It has been possible to earn some money from the fallow land' was the 1st ranked consequence (96.26%). Most of the respondents (92.8%) had faced highly severe problems. 'Shortage of food for cattle during the cropping season', 'lack of nutritious fodder' and 'lack of good medical treatment' were the main problems. Knowledge, number of trainings received, cosmopolitanism and extension media contact showed significant positive relationship with the farmers' perceptions on related causes, consequences and faced problem of livestock rearing. Based on the findings, it is recommended that respective authorities i.e., the Department of Livestock Services, the Department of Agricultural Extension and NGOs might foster livestock rearing to enhance this alternate livelihood in the study area.

Keywords: Causes, consequences, grazing land, livestock rearing, paddy field

Introduction

Bangladesh is predominantly an agricultural country and agriculture is the backbone of Bangladesh's economy. Livestock animals, are kept especially on a farm, for economic benefits. In Bangladesh, these are generally poultry, cattle, goats and sheep etc. Livestock constitutes an integral part of the wealth of a country, since in addition to draft power and leather; it provides manure, meat and milk to the vast majority of the people. About 61.82% of the people live in rural areas (Statista, 2021), and 48.4% of the total workforce is involved in agriculture (FAO, 2021), and agriculture contributes 17.5% of the gross domestic product (GDP) of the country (FAO, 2021). Majority of the rural people are dependent mainly on cropping and livestock farming for their livelihood. Livestock sub-sector is playing a crucial role in the traditional subsistence farming, contributing about 2.5% of the GDP (BIDS, 2019), and providing employment to 20% of the population as full-time and 50% of the population as part-time (Rahman et al., 2014). The majority of the rural households in Bangladesh have an average of 1.52 bovine animals (Banglapedia, 2021). The livestock sub-sector plays a vital role for the economic development of agro-based Bangladesh. About 48% of the meat comes from cattle (cow and buffalo), 40% from poultry and 12% from sheep and goats (Daily Star, 2018).

Almost every household (83.9%) in Bangladesh possesses livestock (Banglapedia, 2021). Members of the household have an affinity for rearing livestock and also expertise for caring their owned livestock. In the southwestern part of Bangladesh, a large area remains under monocropping. Only in monsoon, T. Aman rice is grown from September to December. In the other time of the year, large areas remained fallow due to a lack of fresh irrigation water; salinity problem and the underground water also contain soluble salt. On the other hand, the

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stored fresh water in the pond or small canals is not sufficient for crop cultivation. All the rivers and large canals remain full of saline water (Hoque, 2019). Now some government organizations and NGOs try to cultivate a second crop after short duration T. Aman rice variety, such as sunflower, mungbean, wheat, etc. However, during the cultivation of short-duration rice variety, the rice production is reduced and very often the second crop's cost of production is also very high. Thus, the farmers are not enough interested in that cropping system. In that area, very often people keep the land fallow and use it for grazing of different livestock such as cows, goats, sheep etc. But it is not well planned, the naturally born grass is directly eaten by the livestock in that area.

Livestock rearing is an important income generating activities that was initiated by the farmers, and eventually nurtured and aided by different government, non- government organizations for livelihood security of the rural villagers as they have scanty opportunity to earn livelihood during the fallow period. It is quite pertinent and necessary to know the other salient causes of participation of the rural farmers towards livestock rearing. But a very limited research work has been done on this aspect. Therefore, the researcher felt necessity to conduct a research entitled "Causes and consequences of livestock rearing during fallow period of crop production as perceived by the farmers".

In view of above-cited facts, the present study was conducted with the following specific objectives:

i. To point out the causes of livestock rearing;
ii. To explore the consequences of livestock rearing;
iii. To describe the socioeconomic characteristics of the respondents;
iv. To ascertain the relationship between the selected characteristics of causes and consequences; and
To find out the problems associated with livestock rearing.

Materials and Methods

The study was designed to investigate the causes and consequences of livestock rearing during fallow period of crop production. It was conducted at six different villages of Assasuni upazila under Satkhira district. The of collection of data was conducted by interviewing the villagers, both male and female. Data were collected from the randomly selected 111 respondents during May 08 to December 23, 2021. An ex-post facto explanatory cross sectional research design was used for the study (Hasan et al., 2018). The study was quasi-experimental and tried to predict the relationship of the selected characteristics of the respondents with the causes and consequences of livestock rearing. Data were collected through a face-to-face interview.

The selected 13 characteristics of the respondents, i.e., the independent issues, were (i) age, (ii) gender, (iii) family size, (iv) educational qualification, (v) livestock rearing experience, (vi) crop production experience, (vii) aquaculture experience, (viii) knowledge on agriculture, (ix) farm size, (x) monthly family income, (xi) training received, (xii) cosmopolitanism and (xiii) extension media contact. The focus variable of the study were the causes of rearing livestock, consequences produced as a result of livestock rearing and the problems faced while rearing the ruminant animals. All the selected characteristics were measured following standard procedure and then categorized and arranged in simple table for interpretation and discussion (Islam et al., 2019 and Mondol et al., 2019). Data analysis was done by using a micro-computer with SPSS and MS Excel. The researcher converted all qualitative data to quantitative form by means of applying some appropriate scoring technique. A coding plan was developed and code numbers were given to each category of measurements. Number, frequency, percentage, mean, standard deviation and range were used for statistical description. Pearson's Product Moment Correlation Coefficient 'r' was used to ascertain the relationship between selected characteristics of the respondents and the causes and consequences of livestock rearing. Throughout the study, five percent (0.05%) level of probability was used.

In this study, each respondent was asked to indicate the causes of different livestock rearing in the study locale. Ultimately 20 causes of livestock rearing were incorporated in the interview schedule. Each respondent was asked to indicate the score (rating scale) of the causes of livestock rearing against each of the statements. The causes of livestock rearing was rated as strongly agree, agree, undecided, disagree and strongly disagree and the rating scale was assigned as 5, 4, 3, 2, 1 respectively. The score of the causes of livestock rearing for a respondent was determined by summing up the scores of all the causes mentioned in the interview schedule. The possible range of causes' score was 20 to100 for the respondents.

To compare the perception of the respondents regarding the selected statements on causes of livestock rearing a Farmers' Perception on Causes Score (FPCS) was calculated by using the following formula (concept adopted and modified from Hamid et al., 2019):

$$FPCS= N_{sa}\times5+N_a\times4+N_u\times3+N_{da}\times2+N_{sda}\times1$$

Where, FPCS= Farmers' Perception on Causes Score; Nsa= Number of respondents rated the statement as strongly agree; Na= Number of respondents rated the statement as agree; Nu = Number of respondents rated the statement as undecided; Nda= Number of respondents rated the statement as disagree; Nsda= Number of respondents rated the statement as strongly disagree.

Farmers' Perception on Causes Index (FPCI) is the ratio of observed cause perception score to possible highest cause perception score and multiplied by 100. It was calculated the following formula:

$$FPCI\ (\%) = \frac{\text{Observed perception score on causes}}{\text{Possible highest perception score on causes}}\times100$$

On the basis of the obtained FPCI value ranking was done among the individual statements.

Similarly the Farmers' Perception on Consequences Score (FPCqS) and Farmers' Perception on Consequences Index (FPCqI) were calculated, and then the 20 consequence statements were ranked based on the obtained index value.

In this study, each respondent was asked to indicate his/her problems faced for rearing different livestock animals. Ultimately 10 problems of livestock rearing were incorporated in the interview schedule. Each respondent was asked to identify intensity of the problems of livestock rearing against each of the statements. The problem of livestock rearing was rated as highly severe, severe, moderately severe, less severe and not at all and the rating score was assigned as 4, 3, 2, 1, and 0, respectively. The problem of livestock rearing score of a respondent was determined by summing up the scores of all the problems mentioned in the interview schedule. The possible range of score was 0 to 40 for the respondents.

The severity of a problem of livestock rearing was determined based on Problem Severity Score (PSS). The PSS was determined by using the following formula (Islam et al., 2020):

$$PSS= N_1\times4+N_2\times3+N_3\times2+N_4\times1+N_5\times0$$

Where, N_1= Number of respondents faced the problems and rated as highly severe; N_2= Number of respondents faced the problems and rated as severe; N_3= Number of respondents faced the problems and rated as moderately severe; N_4= Number of respondents faced the problems and rated as less severe; and N_5= Number of respondents did not face the problems at all and rated as not faced at all.

After determination of PSS, the Problem Severity Index (PSI) for each of the problem was determined by following formula:

$$PSI\ (\%) = \frac{\text{Observed problem score in livestock rearing}}{\text{Possible highest problem score in livestock rearing}}\times100$$

Then the 10 problem statements were ranked based on the obtained index value.

Results and Discussion

A. Causes of livestock rearing

Every activity has its own happening reason. In the southwestern coastal area of Bangladesh a large part remains under monocropping, i.e., in monsoon *T. Aman* rice is grown and after harvesting that crop the arable land remains fallow, due to the effect of salinity. During this period most of the farmers rear livestock in that fallow arable land as there is some fodder available for grazing. However, this is not the sole reason for livestock rearing to be considered as the cause of livestock rearing. This study tried to find out the other salient causes of livestock rearing in the study area.

(i) Rank order of the causes of livestock rearing

The data presented in **Table 1** showed different causes of livestock rearing and their relative rank order position perceived by the respondents. The score of ranged from 324 to 546 whereas the possible range was 111 to 555.

Table 1. Rank order of the causes of livestock rearing as perceived by the respondents

Sl. No.	Causes of Livestock Rearing	Score	FPCI (%)	Rank
1.	Paddy is cultivated once a year and the land remains fallow	546	98.37	1st
2.	There is comparatively more time for grazing cattle	536	96.57	4th
3.	Naturally grown grass can be fed	526	94.7	5th
4.	A source of additional family income	543	97.8	2nd
5.	Anyone in the family can nurture it easily	538	96.9	3rd
6.	Milk and fuel are available from cows	515	92.7	6th
7.	It is the tradition of many aristocratic families	324	58.3	19th
8.	2nd or 3rd crop production is costly	415	74.7	17th
9.	The yield of 2nd or 3rd crop is also much less	410	73.8	18th
10.	Raising cattle is an easy way to save money	480	86.4	11th
11.	Livestock acts as a source of emergency money	497	89.5	9th
12.	Many people use cattle in religious festivals	471	84.8	12th
13.	Raising cattle is a dependent business	456	82.1	14th
14.	In need of social festivities. As; Marriage, Akika etc.	509	91.7	7th
15.	Due to the high price of cattle	465	83.7	13th
16.	With a little investment one can make a profit in less time	454	81.8	15th
17.	Cattle care is relatively easy	482	86.8	10th
18.	In addition to the main work, cattle can be easily reared	498	89.7	8th
19.	Some people kept cattle as a hobby	444	80.0	16th
20.	Algae are being used as cattle feed in the southern region	410	73.8	18th

(ii) Respondents' categorization on the basis of perception on the causes of livestock rearing

Results presented in Table 2 indicate that, all of the respondents (100%) had highly clear perception score (FPCS) for the causes of livestock rearing. The minimum and maximum score was 68 and 95 with the mean of 85.18 and standard deviation of 4.94.

Table 2. Distribution of the respondents according to their FPCS for livestock rearing

Causes	Categories of perception clarity	Score	N=111		Mean±SD	Range (observed)	
			Number	%		Min.	Max.
Livestock Rearing (Score)	Low	≤33	0	0	85.18 ±4.94	68	95
	Medium	34-66	0	0		Range (possible): 20-100	
	High	>66	111	100			

'Paddy is cultivated once a year and the land remains fallow at other times' is the main cause (1st) of livestock rearing in that area. Beside this, the other causes are 'a source of additional family income' (2nd), 'anyone in the family can nurture it easily' (3rd), 'there is comparatively more time for grazing cattle' (4th), 'naturally grown grass can be fed' (5th), and so on, as mentioned in Table 1. 'Algae are being used as cattle feed in the southern region' (18th), 'the yield of 2nd or 3rd crop is also much less' (18th) and 'it is the tradition of many local aristocratic families' (19th) are the least important reasons.

Livestock is the basis of survival for many of the poverty stricken people and the landless (<0.02 ha) households in Bangladesh. The poorest peoples often collect dung from fields for making dried dung cakes to sell to other people as fuel material during the winter.

The local office of the Department of Livestock (DLS) and the Department of Agricultural Extension (DAE) have also ratified the ranked reasons which have been mentioned by the respondents.

Sometimes, very poor people (very often the females) rear animals on shared ownership, whereby poor people care for richer people's animals in return for 50% of its production including offspring (Islam, 2008). Dairy provides a sustainable subsidiary occupation for the unemployed rural poor (Shamsuddoha, 2009).

B. Consequences of livestock rearing

Every cause has a result and consequence. Consequence means 'the effect, result, or outcome of something occurring earlier'. There might have many consequences of livestock rearing in the study area. However, by rigorous exploration, the researchers have found 20 vivid and visible consequences in the present study.

(i) Rank order of the consequences of livestock rearing

The data presented in Table 3 showed different consequences of livestock rearing and their relative rank order position as perceived by the respondents. The score of ranged from 213 to 534, where possible range was 111 to 555.

Table 3. Rank order of the consequences of livestock rearing as perceived by the respondents

Sl. No.	Consequences of Livestock Rearing	Score	FPCqI (%)	Rank
1.	Economic prosperity is coming	485	87.38	4th
2.	Livestock production has increased	468	84.32	7th
3.	The food security and nutrition needs of the villagers were largely met	386	69.54	17th
4.	These areas have become self-sufficient in meat	332	59.81	18th
5.	Milk production has increased	451	81.26	11th
6.	Extreme poverty has been somewhat eradicated	430	77.47	15th
7.	Many women have become self-reliant	467	84.14	8th
8.	Economic security has been ensured	449	80.90	12th
9.	Social conditions have improved	435	78.37	14th
10.	Appropriate use of natural resources has been ensured	481	86.66	5th
11.	It has been possible to earn some money from the fallow land	534	96.26	1st
12.	Cattle manure is being used in agriculture as organic manure	474	85.40	6th
13.	The use of chemical fertilizers is relatively low in these areas	243	43.78	19th
14.	Using dung in fish farming land is giving good results	510	91.89	2nd
15.	Peoples are getting a large amount of money from cattle	448	80.72	13th
16.	Money is being made available in times of crisis	461	83.06	9th
17.	Unemployment problems of many have been solved	425	76.57	16th
18.	It has created employment for the elderly and women	452	81.44	10th
19.	Proper use of uncultivated land has been ensured	489	88.10	3rd
20.	Social solidarity and brotherhood have been strengthened	213	38.37	20th

Through livestock rearing, 'it has been possible to earn some money from the fallow land' was the 1st ranked consequence. 'Using dung in fish farming land is giving good results' placed in 2nd rank. 'Proper use of uncultivated land has been ensured' (3rd), 'economic prosperity is coming' (4th) and 'appropriate use of natural resources has been ensured' (5th) obtained the immediate next positions respectively. The least ranked consequence was 'social solidarity and brotherhood have been strengthened' (20th).

All the consequences were good enough to bring some wellbeing for the local inhabitants of the study area. Department of Livestock (DLS) and the Department of Agricultural Extension (DAE) have also agreed the ranked consequences mentioned by the respondents.

(ii) Respondents' categorization on the basis of perception on the consequences of livestock rearing

The data presented in Table 4 indicate that almost all of the respondents (98.2%) had highly score of consequences and rest (1.8%) had medium score on perception of consequences of livestock rearing. The minimum and maximum score were 63 and 86 with the mean 77.20 and standard deviation of 4.21.

Table 4. Distribution of the respondents according to their FPCqS of livestock rearing

Consequences	Categories of perception clarity	Score	N=111		Mean±SD	Range (observed)	
			Number	%		Min.	Max.
Livestock Rearing	Low	≤33	0	0	77.20 ±4.21	63	86
	Medium	34-66	2	1.8		Range (possible): 20-100	
	High	>66	109	98.2			

Livestock rearing has enabled the local residents to earn some money from the fallow land. Besides, the dung is being used in fish farming land and is giving good results, milk production has increased tremendously, money is being made available in times of crisis, employment opportunity have been created for the elderly and women, etc. were some of the good consequences of livestock rearing.

Parveen (2008) opined that care of all livestock animals is an important domain for peoples. Cattle, sheep and goats are led to graze by older peoples and children, while housewives prepare feed, feed and clean animals, and very often milk cows. Jahan and Rahman (2003) also confirm this finding. Eggs and milk tend to be sold by peoples, primarily within the premise of the villages. Livestock rearing was found difficult for small families due to the small number of working members. Goat and cow rearing (even on a shared-basis) requires collection of fodder or taking the animals regularly for grazing. The farmers should be trained from grass production. Peoples often face difficulties to get support from government veterinary hospitals. This service should be made easily available for the farmers.

C. Socioeconomic characteristics of the respondents

Table 5 represents the socioeconomic characteristics of the respondents. Highest proportion (43.2%) of the respondents was middle aged. The minimum and maximum age was 19 and 85 years respectively with a mean of 43.72 years and standard deviation 14.47. Among the respondents 57.6% were male and 42.4% were female. The majority of the families (42.3%) were medium sized (4-6 members). The minimum and maximum family members of the respondents were 3 and 15 respectively with a mean of 5.09 and standard deviation of 1.86. The highest portion (57.7%) of respondents had secondary level of education. The minimum and maximum schooling years were 0 and 17 classes respectively with a mean of 6.88 and standard deviation of 4.61. Highest proportion (34.2%) of the respondents had low (≤10 years) and medium (11-20 years) level of livestock rearing experience with a mean of 20.12 and standard deviation 10.95. The maximum and minimum experiences range from 50 years to 5 years respectively.

The highest proportion (32.5%) of the respondents had high level (>20 years) of crop production experience with a mean of 23.81 and standard deviation 14. The maximum and minimum experiences range from 65 years to 5 years respectively. Also, the highest proportion (67.6%) of the respondents had no aquaculture experience with a mean of 15.58 and standard deviation of 8.21. The maximum and minimum experiences ranged from 40 years to 5 years respectively. Majority of the respondents (78.4%) had low knowledge regarding scientific method of livestock rearing, with minimum and maximum score of 0 and 8 respectively. The mean of this variable was 2.57 with a standard deviation of 1.39. The farm size of the maximum respondents (69.4%) was small (0.21-1.0 ha). The minimum and maximum land sizes of the respondents were 0.00 ha and 6.57 ha respectively with a mean of 0.6572 and standard deviation of 0.75. The highest portion of the respondents (65.8%) had medium income (10,000-20,000 BDT month-1) with a mean and standard deviation of 15,293.69 and 8,870.38 respectively. The minimum and maximum income was 5,000 BDT and 85,000 BDT.

Among the total respondents, 77.5% had no training in different agricultural sectors, and the maximum number of trainings was 2 to minimum 0 numbers of training. The majority of respondents (83.8%) had low cosmopolitanism. The minimum and maximum score of the respondents were 1 and 9 with a mean of 2.53 and a standard deviation 1.14. Most of respondents (97.3%) had rare extension media contact, and the minimum and a maximum score of the respondents were 6 and 25.

Table 5. Distribution of the respondents according to their socioeconomic characteristics

Respondents	Categories	Score	N=111		Mean±SD
			Number	%	
Age (Years)	Young	≤35	36	32.4	43.72 ± 14.47
	Middle	36-55	48	43.2	
	Old	>55	27	24.4	
Gender (Type)	Male		64	57.6	
	Female		47	42.4	
Family size (Numbers)	Small	≤4	46	41.4	5.09±1.86
	Medium	5-6	47	42.3	
	Large	>6	18	16.3	
Educational qualification (Schooling years)	Illiterate	0	17	15.3	6.88±4.61
	Can sign only	0.5	12	10.8	
	Primary	1-5	7	6.3	
	Secondary	6-10	64	57.7	
	Higher Secondary	11-12	6	5.4	
	Undergraduate	13-16	3	2.7	
	Postgraduate	>16	2	1.8	
Livestock rearing experience (Years)	No	0	1	0.9	20.12±10.95
	Low	≤10	38	34.2	
	Medium	11-20	38	34.2	
	High	>20	34	30.7	
Crop production experience (Years)	No	0	23	20.7	23.81±14.00
	Low	≤10	24	21.6	
	Medium	11-20	28	25.2	
	High	>20	36	32.5	
Aquaculture experience (Years)	No	0	75	67.6	15.58±8.21
	Low	≤10	20	18	
	Medium	11-20	11	9.9	
	High	>20	5	4.5	
Knowledge (Score)	Low	≤3	87	78.4	2.57±1.39
	Medium	4-6	21	18.9	
	High	>6	3	2.7	
Farm size (ha)	Landless	≤0.02	2	1.8	0.6572±0.75
	Marginal	0.02-0.2	15	13.5	
	Small	0.21-1.0	77	69.4	
	Medium	1.01-3	16	14.4	
	Large	>3	1	0.9	
Family income (BDT month^{-1})	Low	<10000	25	22.5	15293.69±8870.38
	Medium	10000-20000	73	65.8	
	High	>20000	13	11.7	
Training received (Numbers)	No	0	86	77.5	0.279±0.558
	Low	1	19	17.1	
	Medium	2	6	5.4	
	High	>2	0	0	
Cosmopolitanism (Score)	Low	≤3	93	83.8	2.53±1.14
	Medium	4-8	17	15.3	
	High	>8	1	0.9	
Extension media contact (Score)	No	0	0	0	14.16±4.35
	Rare	1-24	108	97.3	
	Occasional	25-48	3	2.7	
	Often	49-72	0	0	
	Regularly	>72	0	0	

D. Relationship between the selected characteristics of the respondents with the causes, consequences and problems of livestock rearing perceived by the respondents

Among the selected twelve characteristics (except 'gender', because gender is a nominal type of data and not suitable for correlation test) knowledge, cosmopolitanism and extension media contact had a significant and positive relationship with causes of livestock rearing at a 1% level of significance. It means that the higher the knowledge, cosmopolitanism and extension media contact the higher the perception of the causes of livestock rearing. Training received had a significant and positive relationship with causes of livestock rearing at a 5% level of significance. Educational qualification and family income had a positive but non-significant relationship. Age, family size, livestock experience, crop production experience, aquaculture experience and farm size had a non-significant and negative relationship.

Knowledge, training received, cosmopolitanism and extension media contact had a significant and positive relationship with consequences of livestock rearing at a 1% level of significance. It means that the higher the knowledge, training received, cosmopolitanism and extension media contact the higher the consequences of livestock rearing. Educational qualification, farm size and family income had a positive but non-significant relationship. Age, family size, livestock experience, crop production experience, and aquaculture experience had a non-significant and negative relationship.

Table 6. Relationship between the selected characteristics with causes, consequences and problems of livestock rearing [Pearson's Product Moment Correlation Coefficient 'r']

Characteristics (Independent issues)	Focus variable	
	Causes	Consequences
1. Age	-0.101	-0.168
2. Family size	-0.022	-0.028
3. Educational qualification	0.127	0.181
4. Livestock experience	-0.111	-0.154
5. Crop production experience	-0.034	-0.188
6. Aquaculture experience	-0.172	-0.163
7. Knowledge	0.290**	0.351**
8. Farm size	-0.030	0.047
9. Family income	0.013	0.124
10. Training received	0.215*	0.320**
11. Cosmopolitanism	0.313**	0.316**
12. Extension media contact	0.336**	0.250**

In fact, the causes and consequences regarding livestock rearing largely depend on contacts of the farmers with the service providers, and extension media. Frequent-communications with the service providers (e.g., extensionists, input dealers, livestock experts, etc.) and extension media (e.g., individual, group, and mass media) positively influenced the attitude of the farmers (both beneficiaries and non-beneficiaries) towards livestock rearing (Zahan, 2008; Sadat, 2002). Moreover, opinion, knowledge, and adoption of selected livestock programs were determined through extension media contact and attitude of the farmers (Kaur, 1988).

E. Problems related to livestock rearing

There is no venture which doesn't have any problems. Livestock rearing is also not an exception. The respondents faced various types of problems during the operationalization of livestock rearing. By consulting with the study area dwellers 10 problems were identified which have been mentioned in Table 7.

(i) Relative position (rank order) of the problems of livestock rearing as perceived by the respondents

The data showed in Table 7 are representing different problems of livestock rearing and their severity as perceived by the respondents. The score of severity ranged from 215 to 434, where possible range was 0 to 444.

Table 7. Relative position (rank order) of the problems of livestock rearing faced by the respondents

Sl. No.	Problems in Livestock Rearing	Score	PSI (%)	Rank
1.	There is a shortage of food for cattle during the cropping season	434	97.74	1st
2.	Lack of nutritious fodder	387	87.16	6th
3.	Sometimes grass cannot grow due to salinity and lack of water	426	95.94	2nd
4.	During the summer there is a shortage of potable water in the lake (beel)	434	97.74	1st
5.	Lack of good medical treatment for cattle	395	88.96	3rd
6.	There is no fair market system for buying and selling cattle	288	64.86	8th
7.	Social recognition and economic problems in raising cattle	215	48.42	9th
8.	Lack of government support.	370	83.33	7th
9.	Farmers lack training in cattle	389	87.61	5th
10.	Cattle theft occurs	390	87.83	4th

'Shortage of food or feed for cattle during the cropping season' and 'during the summer there is a shortage of potable water in the lake (i.e., beel)' were the jointly 1st ranked problems. 'Sometimes grass cannot grow due to salinity' and 'lack of water' placed in 2nd rank. 'Lack of good medical treatment for cattle', 'cattle theft occurs' and 'farmers lack training in cattle' obtained 3rd, 4th and 5th rank, respectively. If these faced problems have been controlled by the incumbent authority, and if the farmers get some aid and assistance to overcome the problems the production of the livestock might have increased tremendously.

(ii) Respondents categorization based on faced problems in livestock rearing

The data presented in Table 8 represent that the lion's share of the respondents (92.8%) had faced highly severe problems and the rest (7.2%) had faced severe problems. The minimum and maximum score was 22 and 38 with the mean 33.45 and standard deviation 2.44.

The respondents were rearing livestock as they didn't have a suitable alternative to earn livelihood in the fallow period when the arable land remain uncultivated. In a sense, the respondents were compelled to do so. However, the majority of them are facing a highly severe extent of problems that must be addressed and eradicated at the earliest possible time to sustain the productivity of the reared livestock.

Table 8. Distribution of respondents according to their perception on problems of livestock rearing

Problems	Categories	Score	N=111		Mean±SD	Range (observed)	
			Number	%		Min.	Max.
Livestock Rearing	Less severe	<11	0	0	33.45±2.44	22	38
	Moderately severe	11-20	0	0			
	Severe	21-30	8	7.2			
	Highly severe	>30	103	92.8			
						Range (possible): 0-40	

Conclusion

The most important cause was monoculture of paddy compels to keep land fallow which provoked them to rear livestock, and livestock rearing in fallow land contributes to earn livelihood. Though the prospects of livestock rearing regarding the causes and consequences are clear, the farmers faced highly severe problems such as shortages of food in cropping season and potable water in summer. The prospects of the farms regarding causes and consequences of livestock rearing were affected by farmers' knowledge, training received, cosmopolitanism and extension media contact. Thus, to boost up the existing practice of livestock rearing, the farmers should be provided with sufficient number of trainings and extension support so that they could overcome the existing problems and sustain the livelihood earning.

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Conflict of Interests
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References

Banglapedia.(2021).*Livestock*.https://en.banglapedia.org/index.php/Livestock#:~:text=On%20average%2C%20each%20household%20owns,of%20livestock%20over%20the%20households

BIDS (Bangladesh Institute of Development Studies). (2019). *Barriers to Development of Livestock Sub-sector in Bangladesh*. https://bids.org.bd/page/researches/?rid=36#:~:text=The%20livestock%20sub%2Dsector%20is,GDP%20is%20about%202.5%20percent

Daily Star. (2018). *Self-sufficient in fish, meat* (Feb 11, 2018). https://www.thedailystar.net/frontpage/self-sufficient-fish-meat-1532953

FAO (Food and Agriculture Organization of the United Nations). (2021). *Implementation of the Global Strategy in Bangladesh*. https://www.fao.org/asiapacific/perspectives/agricultural-statistics/global-strategy/results-in-the-region/bangladesh/en/

Hamid, M.I., Datta, S. and Islam, M.M. (2020). *Problems faced by the sub-assistant agriculture officers (SAAOs) working in department of agricultural extension*. Research in Agriculture, Livestock and Fisheries, 7(1): 61-73. DOI: *https://doi.org/10.3329/ralf.v7i1.46832*

Hasan, M.F., Begum, H. and Khatun, F. (2018). *Research Methodology in Social Sciences*. Borna Prokashoni, Dhaka, Bangladesh.

Hoque, M.E., Haque, S.S., Hossain, M.M., Sen, M. and Karmakar, S. (2019). *Water quality parameter as a predictor of small watershed land cover*. Ecological Indicators, 106, p.105462.

Islam, M.S., Islam, S., Islam, M., and Billah, M.M. (2019). *Exploring Women Participation in Small-scale Dairy Farming: A Case of Paikgachha Upazila, Khulna, Bangladesh*. Asian Journal of Research in Animal and Veterinary Sciences, 3(4), 1-13. https://journalajravs.com/index.php/AJRAVS/article/view/30051

Islam, M.Z.A. (2008). *Survival Strategies of the Female Displaces in Rural Bangladesh: A Study of Two Riparian Villages on the Right Bank of Jamuna*. XII World Congress of Rural Sociology, Goyang, Korea. https://scholar.google.com/citations?view_op=view_citation&hl=en&user=Hd-1HMUAAAAJ&citation_for_view=Hd-1HMUAAAAJ:UeHWp8X0CEIC

Islam, S.S., Hasan, M.S., Ghosh, N., Islam, M.S. and Islam, M.M. (2020). *Prospects and Problems of Indigenous Sheep Production in South-Western Coastal Regions of Bangladesh*. The Journal of Agricultural Sciences - Sri Lanka, 16(1): 54-66. DOI: http://doi.org/10.4038/jas.v16i1.9183

Jahan, N. and Rahman, H. (2003). *Livestock Services and the Poor in Bangladesh: A Case Study*. Danish Agricultural Advisory Centre, Udkaersvej 15, Skejby, DK- 8200 Aarhus N, Denmark. An Initiative by Danida, IFAD and World Bank.

Kaur, M.R. (1988). *An Evaluative Study of Women Development Program Under Indo German Dhauladhar Project Palampur, District Kumgra, H. P.* Thesis Abstract, XVI (4): 258. 75. https://indcat.inflibnet.ac.in/index.php/thesesrequest?id=105104

Mondol, S., Mollick, A., Ahmed, M. B., and Islam, M. M. (2019). *Farmers' awareness regarding deforestation at Jalma union of Batiaghata upazila under Khulna district of Bangladesh*. Research in Agriculture Livestock and Fisheries, 6(2), 193–202. https://doi.org/10.3329/ralf.v6i2.42965

Parveen, S. (2008). *Access of Rural Women to Productive Resources in Bangladesh: A Pillar for Promoting their Empowerment*. International Journal of Rural Studies, 15(1): 1-8.

Rahman, S., Begum, I.A. and Alam, M.J. (2014). *Livestock in Bangladesh: distribution, growth, performance and potential*. Livestock Research for Rural Development, 26 (10). http://www.lrrd.org/lrrd26/10/rahm26173.html

Sadat, M.U. (2002). *Farmer"s Attitude towards Proshika: A Comparative Study between Proshika Beneficiaries and Non Beneficiaries*. M.S. (Ag. Ext. Ed.) Thesis. Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Shamsuddoha, M. (2009). *Development of Livestock Sector through Leading NGO in Bangladesh*. The Annals of the "Ştefancel Mare" University Suceava. Fascicle of the Faculty of Economics and Public Administration, 9(1):1-9. 79

Statista. (2021). *Share of rural population in Bangladesh from 2011 to 2020*. https://www.statista.com/statistics/760934/bangladesh-share-of-rural-population/

Zahan, A. (2008). *Attitude of Rural Women towards Livestock Rearing*. M.S. (AEIS.) Thesis, Development of Agricultural Extension and Information System, Sher-E-Bangla Agricultural University, Dhaka