SCALING UP OF LIVESTOCK PRODUCTION FOR SUSTAINABLE LIVELIHOOD: AN EMPIRICAL STUDY FROM SIRAJGANJ DISTRICT OF BANGLADESH

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ABSTRACT

Livestock is a vital component of the complex farming system in Bangladesh. The current study focuses on the contribution of livestock farming in the livelihood of the farmers as well as the realization of the challenges in livestock farming as perceived by the farmers. A mixed-method research design was used to collect data from 100 livestock farmers of Kamarkhanda Upazila (sub-district) under Sirajganj district. According to the findings of the study, livestock farming has significant contributions in improving the status of livelihood tatus of farming households. It is evident from the findings that majority of the respondents (69%), faced medium level of challenges in livestock farming compared to high level of challenges faced by 28% respondents of the study area. The socio-demographic characteristics of the respondents namely farm size, annual income, training received, subsidy received, and extension media contact seem to have significant contributions with the challenges faced by the farmers in livestock farming. As the livestock sector of Bangladesh has great potential to flourish provided the challenges faced by the farmers are given due attention. Implementation of farmers' friendly livestock policy and the collaborative efforts of public and private sectors are required to boost up livestock productivity in Bangladesh.

Keywords: Livestock, Productivity, Challenges, Livelihood, Capital

INTRODUCTION

Bangladesh is a small country with a large population about 160 million, situated in south Asia with flat land area (147,570 sq.km) (BBS, 2016). The role of livestock sub-sector is vital for the economic development of agro-based Bangladesh. The

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contribution of livestock to National Gross Domestic Product (GDP) is 2.79% and which is 14% in Agricultural share. About 44% of the animal protein comes from livestock sources (DLS, 2018). Moreover, 4.31% of the total export is from the export of leather and leather goods. The 30% of the total tillage is still covered by livestock beside mechanical tillage. Furthermore, 20% of the population is directly and 50% of the population is partially dependent on livestock sector. The sub-sector enjoyed a growth rate of 5.85% during the last fiscal year. The livestock sector contributes largely to rural poor by enabling income and employment generation. Poverty reduction, gender equity and empowerment of women are amongst seventeen set targets of sustainable development goals (SDGs). This sector is also important for food, nutrition, income, export earnings, draft power, bio-fertilizer, and transport.

In Bangladesh, livestock are also important sources of farmers' cash income and in the national economy, livestock contributes a significant portion of foreign exchange earnings by facilitating the export of different livestock products and waste products. About 36% of the total animal protein comes directly from the livestock and the rest 64% come from fish, poultry and pulses (BBS, 2014). Total livestock population in Bangladesh is currently estimated to be 412.244 million and consists of 24.391 million cattle, 1.493 million buffaloes, 26.435 million goats, 3.607 million sheep, 296.602 million chicken and 59.716 million ducks (DLS, 2018). The livestock density has been increasing every year in the country. The density of livestock population per acre of cultivable land is 7.37. Statistics show that about 1.43% of national GDP is covered by the livestock sector and GDP growth rate of livestock is 3.04%. The agriculture sector can be broken down into four main components: crops, livestock, fisheries, and forests. Of these, crops make up 55% of the sector, livestock - 14% while fisheries and forests sector contribute 22% and 9% respectively (Figure 1). Though the share of the animal farming sub-sector in GDP is small, it makes immense contribution towards meeting the requirements of daily essential animal protein.
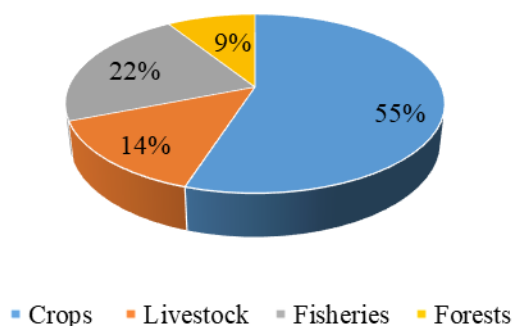

Figure 1. Sectoral share of agricultural GDP in Bangladesh (DLS, 2018)

The major challenges before the Bangladesh livestock sector is sufficient supply of livestock inputs that is feed, fodder and concentrate (Sousa-Poza, 2010) lack of capital, outbreak of diseases, inadequate availability of inputs, inadequate institutional credit, guaranteed and profitable markets for output etc. are some interrelated factors that constrain realization of the full potential of the livestock sector. A considerable number of empirical studies have focused on livestock production and income vulnerability (Islam et al., 2018), constraints faced by the dairy farmers in adopting good farming practices (Singh et al., 2017), present status, problems, and prospects of duck farming (Islam et al., 2016), small scale dairy farming for livelihoods of rural farmers (Uddin et al., 2012), cost and return of small-scale dairy farming (Hossain et al., 2005). In contrast no study has formulated to investigate the role of livestock farming and its associated challenges particularly in the context of Bangladesh. Nowadays, the livestock farming is emerging as popular livelihood platform in Bangladesh. So, it is important to assess the role of livestock farming and its associated challenges in Bangladesh context. The study was aimed to explore the role of livestock farming for sustainable livelihood of the farmers and to investigate the challenges faced by the farmers in livestock farming. To our knowledge, this study is the first attempt to understand the role of livestock farming for sustainable livelihood and the challenges of livestock farming faced by the farmers in Bangladesh.

MATERIALS AND METHODS

Design and locale of the study

The study was conducted in the Kamarkhanda sub-district (also known as Upazila-lowest administrative unit) under Sirajganj district of central Bangladesh (Figure 2). Geographically, Kamarkhanda Upazila is in Agro-ecological zone 4 (Karatoya-Bangali Floodplain) which is characterized by medium high to high land topography and surrounded by the Hurasagar and Karatoya river with maximum annual average temperature is 34.6°C and minimum 11.9°C with annual rainfall 1610 mm (BMD, 2021). This area was selected as the locale of the study because it has been identified as the most important livestock producing area of Bangladesh and the density of cattle population of this district is high. The climatic condition and geographical location of the area is favorable for the growth and development of livestock sector. About 47.06% people of this area depends on agriculture for their livelihoods (BBS, 2016). Three villages namely Bhadraghat, Jamtair and Roydaulatpur were selected purposively for investigation (Fig. 2 and 3). Due to increasing rate of livestock rearing by the farmers of the study area, good communication facilities and researcher's perception about better co-operation from the livestock farmers motivated the researcher to select the study area.

Population, sampling and data collection

All the farmers of the study area involved in livestock farming was considered as the population of this study. An updated list of the farmers involved in livestock farming

were collected from the Upazilla Livestock Office. The total numbers of livestock farmers were 500 in the study area, among them 100 respondents were randomly selected as the sample of the study which was 20% of total population. Then, using qualitative approaches, we investigated additional data to back up our survey findings. For the survey, a pre-tested and structured questionnaire was used to collect data from the selected farmers in a face-to-face setting. Both quantitative and qualitative data were collected and analyzed for this study. Between January and April 2020, survey data was collected with the help of the respective officials of the upazilla.

Figure 2. Map of Sirajganj district Study area showing study area (Black marked)

Figure 3. Map of Kamarkhanda Upazila showing study area (Black marked)

Measurement of variables

Appropriate methods were used to measure the different variables used in the study. Twelve selected socio-demographic characteristics of the respondents such as age, education, household size, farm size, annual income, livestock farming experience, livestock holding, organizational participation, training received, credit received, subsidy received and extension media contact. Appropriate methods were used to operationalize respondent's characteristics by developing suitable scales. The livelihood status of livestock farmers was measured by computing a composite livelihood asset score based on each of the five components of livelihood asset pentagon: i) human capital building score, ii) social capital building score, iii) natural capital building score, iv) physical capital building score and v) financial capital building score. Each of the capital asset was measured against five predefined

dimensions of each livelihood capital asset. Each of the dimension was measured against 3- point rating scale namely increased, unchanged and decreased while the score given as +1, 0 and -1 respectively. The total score for each of the livelihood assets could range from -5 to +5, where positive sign (+) indicated increased status of livelihood asset and negative sign (-) indicated decreased status of livelihood asset.

Challenges of livestock farming was the focus variable of the study. A 4-point rating scale as 'high', 'moderate', 'low' and 'not at all' while weights were assigned to these responses as 3, 2, 1 and 0 respectively to investigate the challenges in livestock farming (Ullah et al, 2011; Ghosh and Hasan, 2013). To measure the challenges of livestock farming a total of 21 statements on seven dimensions were used to collect data from the respondents. The total score of a respondent was determined by summing up the weights for responses against all the statements by using the following formula.

$$CFI = N_h \times 3 + N_m \times 2 + N_l \times 1 + N_{na} \times 0$$

> Where,
>
> CFI = Challenges Faced Index
>
> N_h = Total number of respondents expressed their opinion as 'high' for the statement
>
> N_m = Total number of respondents expressed their opinion as 'moderate' for the statement
>
> N_l = Total number of respondents expressed their opinion as 'low' for the statement
>
> N_{na} = Total number of respondents expressed their opinion as 'not at all' for the statement

Thus, the possible challenges faced index of the respondents could range from 0 to 63. In all cases 0 indicates no challenge and 63 indicates high challenges on livestock farming.

Data analysis

The collected data were properly edited, coded, compiled, and analyzed based on the objectives of the study. All inconsistent data were avoided to eliminate the errors and fault. The Statistical Package for Social Sciences (SPSS), Microsoft Excel and Mini tab were used for the data management. Descriptive statistics, such as frequency, percentage, mean, standard deviation, graphs and charts were used to interpret the findings of the study.

RESULTS AND DISCUSSION

Selected socio-demographic characteristics of the respondents

The selected characteristics of the farmers have been presented in Table 1. The

findings show that highest proportion of the respondents (54%) was in middle aged category followed by young respondents (29%) and old (17%) with a mean of 43.59 years and standard deviation of 11.9. Almost similar findings were found by Sarker (2007), Hoque (2011) and Kowsari (2014). Most of the respondents (41%) had no schooling followed by secondary level of education (33%) and 19% of the respondents had primary level of education while 7% of the respondents had higher secondary level of education with an average of 4.84 years of schooling and standard deviation of 4.58. Almost similar findings were observed by Hoque (2011) and Kowsari (2014) in their respective studies. The household size of the respondents ranged from 2 to 13 with an average of 5.41 which was higher than that of the national average of 4.48 (BBS, 2015) and standard deviation of 2.13. Most of the respondents (50%) had medium size family followed by 39% had small size family while 11% had large size family. The farm size of the respondents ranged from 0.001 ha to 8.86 ha having an average of 0.59 ha which was higher than that of national average of 0.51 ha (BBS, 2015) and standard deviation of 0.96. The highest proportion of the respondents (60%) had small sized farm followed by 25% of the respondents had marginal sized farm and 11% of the respondents had medium sized farm. Almost similar findings were reported by Hossain (2013) and Kowsari (2014) in their studies. The annual income of the respondents ranged from 50 thousand BDT to 475 thousand BDT with an average annual income of 148.48 thousand BDT and standard deviation of 103.31. Data presented in Table 1 show that the highest proportion of the respondents (70%) had low annual income followed by medium income (19%) while only 11% of the respondents had high annual income.

Table 1. Distribution of the respondents according to their selected socio-economic characteristics

Characteristics (scoring system)	Possible score range (observed range)	Categories	Respondents (N=100)		Mean	Standard Deviation
			Number	(%)		
Age (Actual years)	Not defined (20 to 75 years)	Young (18-35)	29	29	43.59	11.90
		Middle Aged (36-55)	54	54		
		Old (>55)	17	17		
Education (Year of schooling)	Not defined (0 to 18 years of schooling)	No schooling	41	41	4.84	4.58
		Primary (1-5)	19	19		
		Secondary (6-	33	33		
		Higher secondary	7	7		
Household Size (No. of members)	Not defined (2 to 13 members)	Small (up to 4)	39	39	5.41	2.13
		Medium (5-7)	50	50		

		Large (above 7)	11	11		
Farm size (Hectares)	Not defined (0.001 to 8.86 ha)	Landless (<0.02)	3	3	0.59	0.96
		Marginal (0.02-0.2)	25	25		
		Small (0.21-1)	60	60		
		Medium (1.1-	11	11		
		Large (>3)	1	1		
Annual income ('000' BDT)	Not defined (50 to 475)	Low (up to 150)	70	70	148.48	103.31
		Medium (151-	19	19		
		High (> 250)	11	11		
Livestock farming Experience (Years)	Not defined (5 to 60 years)	Low (up to 10)	36	36	17.20	11.82
		Medium (11-20)	40	40		
		High (>20)	24	24		
Livestock holding (No. of livestock animal)	Not defined (2 to 3034)	Small (up to 50)	89	89	60.89	312.39
		Medium (51-	6	6		
		Large (>100)	5	5		
Organizational participation (Scores)	Not defined (0 to 7)	No participation	32	32	1.08	1.07
		Low (1-2)	63	63		
		Medium (3-4)	4	4		
		High (>4)	1	1		
Training received (Days)	Not defined (1 to 5 days)	Not received	62	62	0.87	1.41
		Short duration	26	26		
		Medium duration (3-4)	12	12		
		Long duration	0	0		
Credit received ('000' BDT)	Not defined (0 to 30)	Not received	84	84	2.23	6.11
		Minimum amount (up to	11	11		
		Medium amount (16-25)	3	15.5		
		High amount (>25)	2	1.8		
Subsidy received (BDT)	Not defined (0 to 2000)	Not received (0)	86	86	158	446.35
		Low amount (up to 500)	4	4		
		Medium amount (501-	4	4		
		High amount	6	6		
Extension media contact (Scale scores)	0 to 30 (3 to 21)	Low (up to 10)	48	48	10.51	4.61
		Medium (11-	50	50		
		High (>20)	2	2		

SD= Standard Deviation

While annual income has been determined as one of the key factors that affect decision-making regarding the adoption of new technologies. Islam (2011), Hossain (2013) and Kowsari (2014) also found similar findings in their studies. The livestock farming experience of the respondents ranged from 5 to 60 years having the average of 17.2 years and standard deviation of 11.82. The majority of the respondents (40%) of the respondents had medium livestock farming experience while 36% of the respondents had low livestock farming experience and 24% of the respondents had high livestock farming experience. Data presented in Table 1 indicated that majority of the respondents (89%) had small livestock holding compared to 6% had medium livestock holding and only 5% of the respondents had large livestock holding with a mean of 60.89 and standard deviation of 312.39. Majority of the households held more than one livestock species particularly chicken, duck, sheep, cattle or goat. Most animals were held in or around the homestead. Poultry was almost exclusively kept in free-ranging systems to scavenge for their food. The organizational participation score of the respondents ranged from 0 to 7 having an average of 1.08 and standard deviation of 1.07. Data presented in Table 1 indicated that the highest proportion of the respondents (63%) had low organizational participation followed by 32% had no organizational participation while only 4% of the respondents had medium organizational participation. The training received score of the respondents ranged from 0 to 5 days with a mean of 0.87 day and standard deviation of 1.41. Training exposure has significant contributions for knowledge and skill development of the respondents (Yassen et al., 2015; Obaniyi et al., 2014). According to the data presented in Table 1 most of the respondents (62%) did not receive any training on livestock farming while 26% of the respondents received training for short duration and only 12% of the respondents received training for medium duration. Ullah et al. (2011) found that majority (55%) of the farmers had mid duration agricultural training while Rana et al. (2020) found that half of the CIG members (50%) received medium duration training. Data represented in Table 1 revealed that majority of the respondents (84%) did not receive any credit, 11% received credit with minimum amount while only 3% and 2% received credit with medium and high amount respectively. The agricultural subsidy received score of the respondents ranged from 0 to 2000 BDT with a mean of 158 BDT and standard deviation of 446.35. It is evident from the data presented in Table 1 that majority (86%) of the respondents did not receive subsidy for livestock farming while negligible portion of the respondents received subsidy for livestock farming. The extension media contact score of the respondents ranged from 3 to 21 with a possible score range from 0 to 30 having a mean of 10.51 and standard deviation of 4.61. Half of the respondents (50%) had medium extension media contact score while 48% of the respondents had low extension media contact score and only 2% of the respondents had high extension media contact score.

Change of livelihood status of livestock farmers

The livelihood improvement status of the livestock farmers was measured with five assets of livelihoods namely human, natural, financial, physical and social capital. Livelihood change status regarding different assets is shown in the figure 4.

The change of livelihood status of livestock farmers regarding five assets of livelihood was measured by five selected dimensions of each capital. So, the possible range of livelihood status score of the respondents regarding each capital could vary. The observed range regarding human capital was 3 to 5. The mean and standard deviation was 4.55 and 0.54 respectively. All of the respondents had increased status of livelihood regarding human capital. The observed range in case of social capital was 3 to 5. The mean and standard deviation was 4.85 and 0.40 respectively. All of the respondents had increased status of livelihood regarding social capital.
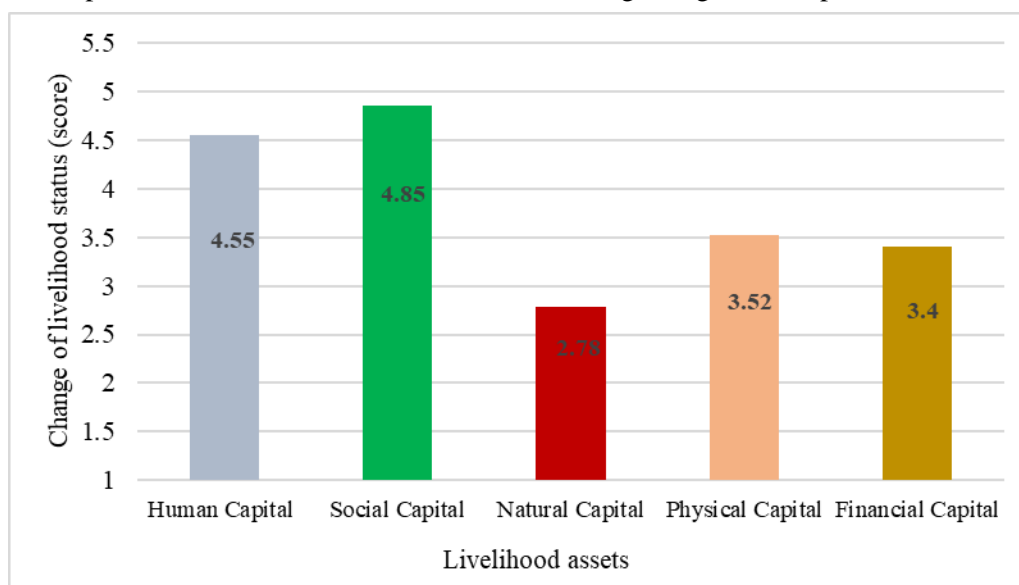
Figure 4. Livelihood change status of the respondents regarding different assets

The observed score range in case of natural capital was 1 to 5. The mean and standard deviation was 2.78 and 0.88 respectively. All of the respondents had increased status of livelihood regarding natural capital. The observed range in case of physical capital was 2 to 5. The mean and standard deviation was 3.52 and 0.79 respectively. All of the respondents had increased status of livelihood regarding physical capital. The observed range regarding financial capital was 2 to 5. The mean and standard deviation was 3.4 and 0.9 respectively. All of the respondents had increased status of livelihood regarding financial capital. Overall livestock farming has significant contributions to improve the status of livelihood capital of the respondents to improve their socio-economic condition. Uddin et al. (2012) reported

that small scale dairy farming has significant contributions in improving livelihoods of rural farmers while Islam et al. (2016) also found similar results in case of duck farming in rural areas of Bangladesh.

Extent of challenges faced by the farmers on livestock farming

Seven dimensions of livestock farming namely technological, economical, socio-psychological, livestock management, situational or environmental, infrastructural, and marketing were used to identify the major challenges of livestock farming. Overall challenges faced index of the respondents varied from 21 to 52 against the possible score range of 0 to 63 with a mean of 38.92 and standard deviation 8.48. Based on the observed overall
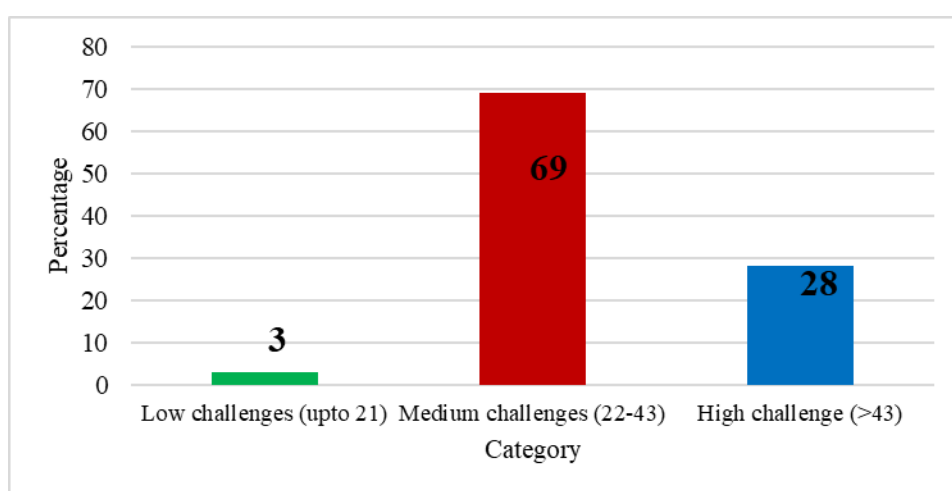
Figure 5. Distribution of the respondents according to their overall challenges faced in livestock farming

challenges faced index, the respondents were classified into three categories as shown in Figure 5. Data presented in above Bar diagram indicates that the majority (69%) of the respondents had faced medium challenges in livestock farming compared to 28% had faced high challenges in livestock farming and only 3% of the respondents had faced low challenges in livestock farming. (Nisha and Vimalrajkumar, 2019) found that majority of the tribal farmers faced a number of constraints including technical, ecological, socio-psychological and livestock management related constraints of livestock farming while Rohila et al. (2021) also reported that majority of the farmers faced different level of constraints in case of adoption of smart agricultural practices. Uddin et al. (2012) also found similar findings in case of small-scale dairy farming in Bangladesh. Basak and Pandit (2013) found that most of the farmers (83.3%) faced medium level of constraints in commercial vegetable cultivation while Das et al. (2018) also found similar findings in case of fish farming in Bangladesh. Almost similar findings were reported by

Haneef et al. (2019) in case of practicing organic farming in Hill region of Uttarakhand, India. According to the opinion most of the livestock farmers faced a range of problems including lack of quality livestock breeds. Majority of the farmers opined that they have to depend on local breeds for livestock farming due to unavailability of quality livestock breeds. As a result, they were unable to receive their desired return from livestock farming. In this case, sustainable breed development policy should be developed to supply improved and highly productive breeds among the farmers. Another problem faced by the livestock farmers were high price of good quality livestock feed. Majority of the farmers said that the acute shortage and low quality of feeds and fodder is one of the most important challenges to livestock development in Bangladesh. Feed and its high price offer a major challenge for livestock development. Singh et al. (2012) and Dhindsa et al. (2014), also observed similar constraints in dairy farming in Punjab, they reported high cost of feed and fodder, inadequate knowledge about balanced feeding, low availability of quality green fodder and dry fodder, as some of the important constraints. Varaprasad et al. (2013), Trailor et al. (2012) and Kumar et al. (2014) reported that, non-availability of pasture, high cost of cakes/ concentrate and inadequate area for fodder cultivation, due to small size of operational holding as major constraints perceived by the farmers. Inadequate training facilities for knowledge and skill development of livestock farmers is another important constraint faced by the livestock farmers. Practical skill can be developed by effective participatory training and in case of the livestock farmers, effective training programs are very necessary as training of livestock farmers essentially contributes to human resource development in case of livestock farming. These findings about the effectiveness of participatory training are in line with Smith and Wandel (2006); Chikaire et al. (2015) and Parhan (2014). Non-availability of timely treatment facilities was also reported as a major constraint by the livestock farmers. The reason may be that the veterinary hospitals were far away from the villages, transport facilities were not adequate, and the veterinary doctors were not available when needed. These findings were in accordance with that of Kumar et al. (2012). Non-availability of medicines and vaccines in time was also another challenge faced by the livestock farmers. As a result, the livestock farmers faced high level of challenges in case of diseases and pest management. Varaprasad et al. (2013) found that non-availability of medicine and vaccines in time was encountered by majority of the farmers in Chittoor District of Andhra Pradesh. Similar finding was reported by earlier researcher (Sarker and Ghosh, 2010).

Results of correlation test

The purpose of this section is to examine the relationships of each of the selected socio-demographic characteristics of livestock farmers and challenges faced by them in livestock farming. Pearson's product moment coefficient of correlation (r) was used to reject a null hypothesis relating to the relationships between the variables concerned. The results of correlation analysis between the concerned variables have been presented in Table 2.

Table 2. Relationship between selected characteristics of the respondents and the challenges faced by them in livestock farming

Focus variable	Respondents' characteristics	Co-efficient of co-relation coefficient (r) with df= 98
	Age	0.007
	Education	0.031
	Household size	-0.171
	Farm size	0.234*
	Annual income	-0.355**
Challenges faced by the respondents in livestock farming	Livestock farming experience	0.003
	Livestock holding	0.024
	Organizational participation	0.181
	Training received	-0.227*
	Credit received	0.027
	Subsidy received	-0.342**
	Extension media contact	-0.367**

* P> 0.05; ** P>0.01

Farm size of the respondents showed significant positive relationship (0.234*) with challenges faced by them in livestock farming. The findings indicated that the farmers with large farm size faced more challenges compared to the farmers with smaller farm size. This is because livestock farm productivity includes total farm area, improvement of farm productivity both in quality and quantity by the application of modern technologies, updated knowledge, improve production inputs and marketing of the farm products. All these are closely linked to livestock farm productivity and the farmers with large farm size faced more challenges compared to the farmers with smaller farm size related to farm management. Kshash (2019) also found that farm size has a significant positive relationship with the constraints faced by the famers in case of summer vegetable cultivation while Kabir et al. (2011) and Basak and Pandit (2013) found significant negative relationship between the concerned variables. Khandker et al. (2014) and Begum et al. (2020) also reported significant positive relationship between the concerned variables. Annual income of the respondents showed significant negative relationship (-0.355**) with challenges faced by the farmers in livestock farming. The farmers with higher annual income had better socio-economic conditions and better access to good quality livestock breed, feed and fodder, drugs and vaccines for diseases management compared to the

farmers with lower annual income. So, the farmers with higher annual income faced lower challenges compared to the farmers with lower annual income. Uddin et al. (2012) and Singh et al. (2017) found significant negative relationship in case of small scale dairy farming while Kshash (2018) found significant positive relationship between the concerned variables. Training received of the respondents showed significant negative relationship (-0.227*) with challenges faced the farmers in livestock farming. It is evident from the findings that training has strong influence on understanding of the challenges and technological efficiency. So, the farmers with more training experiences faced comparatively lower challenges than the farmers with lower training experiences. Singh et al. (2017) found significant negative relationship in case of training received and the constraints faced by the dairy farmers in adopting good farming practices in India. Uddin et al. (2012) also found similar relationship in case of small scale dairy farming in Bangladesh. Subsidy received of the respondents showed significant negative relationship (-0.342**) with the challenges faced by the farmers in livestock farming. The findings indicated that the farmers who received subsidy for livestock farming were so enthusiastic and shows positive attitude in case of adoption and implementation of different new technologies related to livestock farming than the farmers who did not receive subsidy. So, the farmers who received subsidy for livestock farming faced comparatively lower challenges than the farmers who did not receive subsidy for livestock farming. Singh et al. (2017) and Uddin et al. (2012) found no significant relationship between subsidy received and the constraints faced by the farmers in dairy farming in their respective studies. Extension media contact of the respondents showed significant negative relationship (-0.367**) with the challenges faced by the farmers in livestock farming. Respondents who had more contact with extension media had more access to updated information sources and acquired more knowledge on technological aspects which helped them to combat their challenges more efficiently than the farmers with low extension media contact. This relationship is supported by the findings from the study of Singh et al. (2017) and Uddin et al. (2012) in case of small scale dairy farming. Similar relationship was observed by Basak and Pandit (2013) and Kabir et al. (2011) in their respective studies.

CONCLUSION

The present study aimed to determine the role and challenges of livestock farming in Bangladesh. Promoting sustainable livestock farming is important for agricultural diversification, poverty reduction, food security and employment generation. The findings indicate that livestock farming significantly contributes to improve the livelihood of the farmers of the study area. Majority of the livestock farmers faced medium to high challenges regarding different he aspects of livestock farming. The socio-demographic characteristics of the respondents namely farm size, annual income, training received, subsidy received and extension media contact have significant contributions with the challenges faced by the farmers in livestock

farming. Considering the findings of the study, some essential policy recommendations are: extension services of the Department of Livestock Services (DLS) should be strengthened and inputs of livestock farming (quality livestock breed, medicines, vaccines, and livestock feed) should be made available and within the purchasing capacity of the farmers. Interventions are required to develop resilience by the smallholders such as government should undertake safety net programs, need based training, seminar and workshops for the farmers, development of proper marketing channel, value addition of livestock products and incorporation of ICTs for faster dissemination of improved livestock farming technologies for sustainable development of livestock sector.

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