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RESEARCH ARTICLE OPEN ACCESS

IMPACT OF CAPACITY BUILDING AND TRAINING IN DAIRY FARMERS IN BANGLADESH

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ABSTRACT

The dairy industry is a major source of employment, and income for rural population and for supply of nutrition. The dairy industry is dominated by a small holders having 1-3 and accounting for over 90% of milk production in the country. Hence, the capacity building of all the operators (small holders, collectors, milk traders, dairy processors) and supporters (livestock health workers, input suppliers, and government and non-government institutions) of the dairy value chain is vital to improve productivity, efficiency and returns on capital. Capacity building interventions particularly training is hypothesised leading to change in attitude towards animal vaccination, deworming, and treatment and investment in better housing and improved quality animals. The household benefits from higher income flows. The paper empirically examines if these hypothesis holds true for 120 dairy farmers in Chamohar sub-district in Bangladesh who received training in 2022 and 2023. The situation before and after the training is contrasted. The overall conclusion is that training has positive impact on uptake of modern vaccine, and increases household income.

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INTRODUCTION

Undoubtedly, Bangladesh is a successful model in poverty reduction. At the time of its liberation in 1971, Bangladesh was overwhelmed by poverty, food shortage, and scored poorly on most human development indicators. With an average annual GDP growth of 6.5% between 2013 and 2023, Bangladesh has outpaced South Asian peers. The country's GDP per capita was US$2,528 in 2023, compared to US$ 1,119 a decade earlier. And at its current growth rate, Bangladesh is on track to become an upper-middle-income country (at least ~$4,000 GDP per capita) by 2031 and achieving the goal of becoming a developed country by 2041 (GOB, 2020). At the time of country's liberation, approximately 90% of the population lived under the poverty line. According to the World Bank, the percentage of people below the international poverty rate in Bangladesh has been reduced from 41.5 per cent in 2006 to 18.7 per cent in 2022, and extreme poverty has reduced o from 25.1 per cent to 5.6 per cent in the same period. Supporting productive employment opportunities for income generation in the livestock and agriculture sector and establishing sustainable community support mechanisms were considered important strategies to address rural poverty, improve household resilience to cope with adversity and improve women's status within households and in society. Developing human capacity in rural areas has played a major role in overcoming poverty. The share of livestock sector in Bangladesh's national GDP was 1.85% in 2022-23. The country's livestock population in 2022-23 comprised of 24.8 million cows, 1.51 million buffalo, 26.9 million goats, and 3.82 million sheep. The livestock sector accounted for 20% of all direct employment in the country (DLS 2023). The cumulative impact of capacity building efforts is partially responsible for the impressive increase in the total ruminant population has been increased from 53.59million in 2013-14to 57.14million in 2022-23. In the same period, production of milk has been increased from 6.09 million MT to 14.07 million MT, and meat from 4.52 million MT to 8.71 million MT (DLS 2023). All these achievements have been accomplished due to government initiation in capacity building of its personnel as well as livestock farmers. Empirical studies from several districts in Bangladesh corroborate both the role of government training institutions and farmers enterprise in boosting milk, meat, and egg production in the country (Rana *et al*., 2022; Rahman, 2023; Netherlands Enterprise Agency, 2023). Capacity development of farmers in the livestock sector of Bangladesh is considered vital for poverty alleviation, farm efficiency, increasing productivity, and supply of animal protein for a growing, prosperous population (Siddiky, 2017; Alam *et al*.; 2009). There are 1.4 million dairy farms with an average herd size of 1-3 cows. They supply 90% of the milk and beef in the market. Transforming the small and marginal farmers into more productive units is proven way to meet the demand-supply gap for milk and other animal products. Capacity development is viewed as the process through which individuals, organizations and societies obtain, strengthen and maintain the capacities to set and

achieve their own development objectives over time (UNDP (2015). The capacities at three levels encompassing individual, organizational and societies are interdependent and mutually reinforcing. Skill building trainings and peer learning are two key elements in individual development (Yaseen *et al*. 2015). Capacity building for livestock value-chain upgrading includes: a) training and extension service for better animal husbandry practices to improve quality, productivity and nutrition; b) technical advice on professional livestock management, reinforced through exposure visits, attendance in exhibitions,and distribution of audio-visual or printed materials; and iii) formation and management of producer organisations, especially in relation to coordination between producer member, output buyers, bulk input purchase and access to government veterinary services.

The hypothesised causal chain from training interventions can be summarised as follows:

- Improved livestock management through behaviour/attitude changes towards vaccination, deworming, and treatment
- Leads to investments in improvements in livestock housing;
- More hygienic handling of milk, meat and other produce hereby ensuring food safety; and
- Contributing to higher household incomes and expenditure on farm incomes and education and health (Oya et. al. 2017).

The objective of this paper is to quantify the impact of skills training on livestock asset value during the period January 2022 and December 2023. Training was received during this two year period.

MATERIAL AND METHODS

Population of the Study: Chatmohar Upazila (sub-district) in Pabna district in central Bangladesh was selected for the study. This sub-district under Rajshahidivision has 39489 households and a total area of 314.32 km^2. It is located at 24.2250^0 N and 89.2917^0 E.

Figure 1 Map of Chatmohar Upazila

Dairy is a major occupation in the district with more than 1069 households engaged in cow rearing. The Department of Livestock Services (DLS) of Government of India, and NGOs have strong footprint in the area. Large dairy companies like PRAN, BRAC and Milk Vita have arrangement for collection of milk from farmers groups from their villages. DLS, and the private companies have officered training to the farmers in the following topics:

- Vaccination and medication techniques
- Deworming of animals
- Fodder cultivation
- Hygienic milking practices
- Anti-microbial resistance
- Breed selection
- Upgrading housing for animals

All the farmers residing in the sub-district who attended one or more training were considered as the population of the study.

Sampling Procedure: The sample of the population was limited to 120 farmers (76 male, 44 female) selected through random sampling technique. 3 of the 11 Unions from Chatmohar sub- district, were selected randomly and a maximum of 40 farmers from each Union was further stratified. Only those farmers who had obtained training in dairy management in the 24 month period of January 2022 to December 2023 were selected for personal interview at the respondents doorstep.

Table 1. Union wise distribution of respondents

	Respondents			
Union	Male	Female	Total	Female as % of total
Bilchalan	28	12	40	30%
Haripur	27	13	40	33%
Mothurapur	21	19	40	48%
Total	76	44	120	37%
In %	63%	37%		100%

Data Collection: Interview schedule was developed carefully and pre-tested by 20 non sampled respondents to make necessary amendments in the tool; data was collected by conducting personal interviews. The sample respondents were taken into confidence for enabling them to answer the questions properly and to best of their knowledge. They were made known about the objectives of the study so as to get correct and unbiased information.

Data Analysis and Interpretation: Personal interviews were conducted at home and farm of the farmers keeping in view their convenience. The collected data was analysed for descriptive statistics by using STATA. Data was arranged in tabulated for interpretation.

RESULTS AND DISCUSSION

Age group of respondents: The respondents were classified in 3 age groups e.g. 20-35 years, 35-50 years, and above 50 years. As shown in Table 2, about 29% respondents belong to the age group of 20-35 years and respondents in this group are enthusiastic and quick adopters of new ideas as compared to other age groups. While 57%of respondents belong to the age group of between 35-50 years ; this age group is most energetic and assume role of leadership in the union. The age group over 50 years play very important role in coaching younger generation. Many of them view livestock rearing as a post retirement occupation.

Table 2. Age group of respondents

	Respondents			
Union	**20-35**	**35-50**	**Above 50**	**Total**
Bilchalan	11	19	10	40
Haripur	12	23	5	40
Mothurapur	12	26	2	40
Total	35	68	17	120
In %	29%	57%	14%	100%

Literacy wise distribution of respondents: The respondents were classified as illiterate, primary educated, higher secondary pass, diploma holder, graduate and above. As per Table 3, the highest number of illiterates was in Bilchalan union. Overall, 18% of the respondents were illiterate, 36% had primary schooling, 30% had higher secondary schooling, 12% had earned diploma in technical trades and 4% were graduates and above. It shows that that literate persons are keenly interested in livestock training.

Tenurial status of respondents: Land ownership is an important factor determining social status, access to services, and influence decision regarding fodder production on own land.Housing of animals is also determined on availability of land. There were three categories of respondents in the area. Owner, owner cum tenant, and tenant. Most people prefer to manage their affairs without tenants. Because of weak enforcement of contract laws, tenants exercise undue power and are difficult to be dislodged even after tenancy agreement have expired. Owner tenants are those who take land on lease for in addition to their own land. Hence. Owners avoid tenancies as far as possible. Table 4 shows that 78% (majority) respondents were owners, 18% owner cum tenants, and 10 % owner-cum-tenants. Higher ownership of land suggests that owners have the security and are more willing to invest capital for developing livestock business.

Table 3. Literacy wise distribution of respondents

	Education Qualifications					
Union	Illiterate	Primary	Higher Secondary	Diploma	Graduate and above	Total
Bilchalan	10	14	11	2	3	40
Haripur	6	16	11	5	2	40
Mothurapur	6	13	14	7	0	40
Total	22	43	36	14	5	120
In %	18%	36%	30%	12%	4%	100%

Table 4. Tenurial status of respondents

Union	Owner	Tenant	Owner-cum Tenant	Total
Bilchalan	29	8	3	40
Haripur	31	6	3	40
Mothurapur	26	7	6	39
Total	86	21	12	119
In %	72%	18%	10%	100%

Table 5. Duration of training

Union	No. of trainees				
	3 days	7 days	14 days	21 days	Total
Bilchalan	18	15	4	3	40
Haripur	18	11	8	3	40
Mothurapur	17	11	8	4	40
Total	53	37	20	10	120
In %	44%	31%	17%	8%	100%

Table 6. Relevancy of training

Union	Yes	No	Total	Yes as % of total
Bilchalan	33	7	40	83%
Haripur	32	8	40	80%
Mothurapur	31	9	40	78%
Total	96	24	120	80%
In %	80%	20%		100%

Table 7. Size of livestock herd size before and after training

Species	Herd size		Change	
	Before	After	Number	%
Cow	572	642	70	12%
Bull	31	38	7	23%
Goats/sheep	298	316	18	6%
Total	901	996	95	11%

Table 8. Mode of livestock treatment before and after training

Mode	Before		After		Change in %
	No.	%	No.	%	
Traditional	33	26%	27	-22%	-18%
Veterinary hospital	54	42%	89	39%	65%
Private	15	12%	16	6%	7%
No treatment	26	20%	8	-225%	-69%
Total	128	100%	140	100%	9%

Duration of training: The training duration was scheduled as 3 days, 7 days, and 21 days. Table 5 shows that about 44% respondents got training of 3 days, followed by 31% of 7 days and 8% of 3 weeks.

Relevancy of training: As shown in Table 6, 80% respondents reported that these training were relevant to their requirements, while 20% respondents felt otherwise. The reason for their varied response was due to the fact that for various reasons, the livestock herd size of the respondents did not increase or they were genuinely not satisfied with the duration, content, and quality of training.

Size of livestock holding: Table 7 shows that the livestock holding of respondents has shown an upward trend. The increase was 12%, 23%, and 6%in cows, bull fattening, and goats respectively. As a whole increase in livestock size was 11% in the last two years. Vaccination and medication have contributed to the rise of livestock population and fall in mortality. Bull fattening has picked up in Bangladesh due to chances of premium price during Eid, and easy availability of short-term microfinance loans.

Mode of livestock treatment: Table 8 exhibits that before the training program 26% respondents were giving local or traditional treatment to livestock, while 42% were taking animals to government veterinary hospitals for treatment. The coordinated effort of livestock department and linkages developed during training sessions played role in greater acceptance of modern veterinary care. Currently, there is a decline in the number of farmers seeking treatment from traditional practitioners, and an increase of 65% of farmers seeking care at government hospitals and 7% at private vets.

Table 9. Annual mortality of livestock

Species	Average No. per year		Change	
	Before	After	No.	%
Cow and Bull	112	103	-9	-8%
Goats/sheep	189	154	-35	-19%
Total	301	257	-44	-15%

Table 10. Housing System

Union	Kuchha mud and bamboo		Semi-pucca or pucca	
	Before	After	Before	After
Bilchalan	24	24	9	9
Haripur	30	19	6	12
Mothurapur	24	24	7	7
Total	78	67	22	28
In %		-14%		27%

Table 11. Change in asset values of respondents (BDT)

Respondents by category	No. of respondents		Gross Asset value in BDT		
	Before (Jan 2022)	After (Dec. 2023)	Before	After	% change in amount
0-150000	10	4	1118000	514000	-54%
150001-300000	51	41	11879000	9949000	-16%
300001-450000	37	42	13219000	15354000	16%
Above 450000	22	33	13263000	23181000	75%
Total	120	120	39479000	48998000	24%

Annual mortality of livestock: Table 9 shows that overall mortality rate of livestock reduced by 15% after the training program. Higher awareness among farmers about fatal potential of various livestock diseases, deworming, and availability of timely professional help have contributed to the reduction of mortality.

Change in quality of animal housing: Table 10 shows that farmers are more likely to adopt better housing for animals post training. There was an increase of 27% in semi-pucca and pucca housing and a decline of mud housing by 14%. The investment in housing was made by farmers from their own earnings. Many of them segregated cows, bulls, and goats within the housing sheds.

Change in the asset value of the respondents: A major motivation from marginal and small farmers is to increase their livestock assetswith better livestock management.Training is a means to that end.Table 11 shows that trained farmers utilised their training to enhance their assets.Because of higher asset value of herd, inflation and effect of training, more farmers moved up in the asset ladder particularly between 300000 BDT and above 450000 BDT. Overall, there was a 24% increase in asset value. Of this increase, 11% was contributed by increase in herd size. The increase in herd size is due to more animal husbandry skills and availability of veterinary care which reduced mortality by 15%. The prices of animals also rose in line with the country's consumer price index which was 5.5% in 2021 and 7.7% in 2022 i.e. a total of 13.2% in the two years (BBS, 2022).

CONCLUSION

Capacity building and training programmesleads to improved livestock management through behavior/attitude changes towards vaccination, deworming, and treatment. It also results in higher investment in improvements in livestock housing. Household income also rises due to increase in herd size, more production, and earnings from sale of milk and live animals. Few recommendations are made to improve quality of training and its delivery to smallholders:

- There was inconclusive evidence on whether training results into more hygienic handling of milk, meat and other produce by the small holders. This aspect related to food safety may be investigated in future studies.
- Training should be iterative, incremental, and practical in nature. Currently, DLS has no annual training calendar for smallholders.
- Department of Livestock Services should develop a baseline data regarding livestock production at farm level to design informed strategies on small holder development.

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