

## Livelihood improvement of poor women through cow rearing

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### ABSTRACT

A study was conducted to evaluate the livelihood improvement of poor women by cow rearing in Sirajganj district. The studied parameters were farmers status, socio-economic condition, skill development training, source of funding, purchase ability of cows, availability of feeds and fodder, feeding system, chemical composition of feed stuff, health care, cost of cows, net income, various cost of cow rearing, and impact of livelihood improvement of rural women in the studied areas in Sirajganj district of Bangladesh. Total 12 respondents were randomly selected from two villages. Both descriptive and inferential statistics were used to analyze data. The women were treated as hard core poor and poor. The major occupation of selected farmers were cow rearing (100%) followed by beef fattening, crop farming and goat rearing. CP contents of available feed stuffs were compared higher and CF content was lower compared to other unconventional feed stuffs indicated the availability of good quality feeds in studied areas. Total cost of production, gross return and net return per household cow rearing was 13500, 58250 and 54700 BDT and loan recovery rate was 98- 100%, respectively. Food purchasing, cloth purchasing, social status, health care, educational and housing status were increased at 34.38, 31, 25, 20, 17 and 14.28% through cow rearing funded by SDF in studied areas and loan realization trends was better than that of other organizations. The results clearly indicate that drastic livelihood improvement, creation of self-employment and better loan realization through cow rearing practices was possible in the studied areas.

### Introduction

Livestock plays a crucial role in the economy of Bangladesh with a direct contribution around 1.60% to agricultural GDP and the growth rate of GDP in 2016-17 for livestock was highest of any sub-sector at 3.32%, share livestock in Agricultural GDP 14.31%. (DLS, 2017). Milk, meat and eggs are main protein source for people of Bangladesh. Cattle have significant role on contribution to GDP through production of meat, milk and hides. Dairy cattle produces 92.83 metric ton milk against the demand of 148.65 metric ton per year and total deficiency was 55.82 metric ton in the fiscal year 2016-17 (DLS, 2017). Roy et al., (2009) found that 25% of the population in Bangladesh is engaged directly and 50% indirectly to livestock related activities. Dairy cattle rearing are economically suited for rural hard core poor and poor women. It is heritable profession from their ancestor beginning the civilization of the world. Animal husbandry is an adjunct to crop agriculture and cattle and buffalo are kept for milk production, power for various farm operations, village transport, irrigation and production of manure. Cattle and buffalo rearing is extremely livelihood intensive for farm women and development of this sector is the potential path to rural prosperity (Kalash et al., 2009). Dairy cattle rearing play an important role in improving the socio-economic condition of the rural masses by providing additional income as well as complementing agriculture. The rearing of these animals is highly women-oriented as over 60% of all labor is done by women (Mishra, 2008). They are usually maintained on tree leaves, shrubs, Napier

grass, bushes, low cost concentrate and urea-molasses treated straw in rural condition. Average feed cost was 27% of total cost of dairy cattle. Rest comprised 61, 6.0, 2.0 and 4.0 % for animal procurement, labor, housing and health management, respectively (Roy et al., 2009). Haque and Sultana (2007) found that average ratio of roughage and concentrate (mostly of bran and oilcakes) in the diet fed to native cattle in Bangladesh was 78.4:21.6, and minimum ratio of the same for feedlot diet was 30:70. Roughage of the later consisted mostly of silage or good quality hay and concentrate was mostly dominated by grains. Dairy cattle are docile in nature and ease to handle, manage and preferred by rural women as a domestic animal to keep and conservation as their ancestor profession. The main characteristics of zebu cattle are smaller in size, slow growth rate as compared to exotic breeds; but their adaptability is very high in terms of disease resistance, hot - humid climatic stress and adverse nutritional conditions. The resistance to diseases and climatic stress exhibited by particular breed are important consideration. The genetic potential for milk production is important (Khan, 1999). In Bangladesh, about 45% people live below poverty line (BBS, 2014). Dairy cattle enterprise is a profitable and effective option for poor women in Bangladesh. However, still challenges are remaining for the involvement of extreme poor in general. Poor people can earn a lot of money to improve their standard of living by cow rearing. The coordinated efforts of government organization, NGOs and private sectors including micro-finance institutions could address the challenges. In

addition possible linkage to export market of milk by processing in various forms to the Middle East or other countries could be explored. Private- Public Partnership (PPP) could be right approach to go further to promote and strengthen value chain. This intervention could be extended in other South Asian countries. DLS address to the problems of poor in poverty reduction. It is remarkable that cow rearing brings quick benefit. Government and NGOs are providing micro credit; training and technical support to rural farmers to increase the production of dairy cattle. Government of Bangladesh has started a national program on poverty alleviation, self-employment, food supply and increase of hides and skin exportation through livestock rearing. So far, a few works have been done about livelihood change of poor farmers by cow rearing in Bangladesh especially for women. So, the work has been done to measure the livelihood changes of dairy cattle keeper. So, the study was undertaken to investigate the feeding, management, income generation, estimate of livelihood changes of cow rearing poor women and proper utilization of loan and its recovery rate. The present study was conducted to assess the extent of improvement of livelihood of household women by dairy cattle rearing in the study area of Bangladesh.

## Materials and Methods

### Study area

Three villages namely Sailabari and Munsumi , Baniagati villages of Khokshabari union under Sadar upazial of Sirajganj district were selected for this study. A total of 12 farmers, 4 from each viillage were selected for this study. The villages were based on poor human resource and available green fodder and straw with 1 cattle reared per household. However, the study area is very much suitable for dairy cattle rearing to the improvement of livelihood of poor women.

### Preparation of interview schedule

The interview schedule was carefully prepared based on objectives of the study. A draft schedule was developed before preparing the final schedule. The draft schedule was then pre-tested with selected farmers in area and then it was rearranged and modified as required of study. The schedule was developed so simple manner to avoid misunderstanding and to get accurate information from respondents of study area. Then it was finalized according to the experience gathered in primarily field level survey.

### Data collection

The researcher was collected all information through personal interview from individual respondent in their own house. An introductory visit was made to study area when the aims and objects of study were explained to the most of the respondents. This helped to create a friendly atmosphere of respondents. Brief information regarding the nature and purpose of study was

made to the respondents before actual interview. The researcher also established desired rapport building systematically and explained whenever it was felt necessary. The information supplied by respondents was recorded directly on the interview schedule. The information was cross checked carefully before leaving study area to avoid errors. Data was collected in local unit. These were subsequently converted into desirable standard level unit. The respondents were interviewed at their house, so they could give proper information without any hesitation. Excellent cooperation was received from all respondents during data collection period. The selected variables in this study were as follows: educational status, occupational status, socio-economic status, livestock status, feeding, housing condition, disease and health care, routine activities of farmers for dairy cattle rearing, annual cost of production, income, and impact of income for improvement livelihood of poor women.

### Tabulation of data

After completion of field survey all interview schedules were set for its data tabulation for coding and reduction. All individual variables of interview schedules were transferred to master sheet to facilitate tabulation.

### Daily routine works of farmers for dairy cattle

Dairy cattle were kept inside the house of farmer of studied areas. The house was cleaned every morning. They were taken outside the house sometimes. Dairy cattle were supplied with pure drinking water. All farmers used mosquito curtain to protect mosquito for their cows in the studied areas. All tube wells were done arsenic test by the technician of the Department of Public Health and Engineering (DPHE). All test cost was paid by Social Development Foundation (SDF). Some supplements were fed in the morning. Animals were bath daily with fresh water using body brush. Regular combing was done twice daily, As a result external parasites and dust would be removed. Green grass, fodders, rice straw, protein concentrates were fed as routine wise of animals. All the activities were done by the rural women in the studied areas with the help of their male partners.

### Chemical analysis of feeds and fodder

Proximate composition of locally available feeds and fodder were done to investigate crude protein (CP), Crude fiber (CF), ether extracts (EE), nitrogen free extracts (NFE) and ash. The analysis was done in Animal Science Laboratory of Bangladesh Agricultural University according to the method of AOAC (2004).

### Duration of cow rearing

The duration of cow rearing were 12 month of second production cycle was considered.

**Loan taken and repayment of installment**

All respondents were received loan from Gram Samity (GS) Office of SDF. Interest percentage was 10%. The repayment installment was 50 per year with principal amount and interest. All respondent paid their installment weekly basis. Farmers paid their savings money to GS office weekly basis at the amount of Tk.20-50 for their future protection.

**Statistical analysis**

Data were analyzed by descriptive statistics such as number, tabular, mean, percentage, standard deviation etc. A number of tables were prepared keeping in view the objectives of the study. The data was analyzed with the help of SPSS-v-16 computer package program.

**Results and Discussion**

**Status of beef fattening farmers**

The age, education and occupational status of cow rearing farmers are presented in Table1. The cow rearing was practiced by the middle (75%) and old aged (25%) farmers. More than 80% are primary level of education of cow rearing farmers but only17% is under SSC. Islam et al., (2012) reported that 46, 10.7 and 5% had primary, SSC and HSC level of education respectively. In study areas, 100% of selected farmers were engaged only with dairy cattle rearing followed by agricultural crop farming, beef fattening and goat rearing.

**Training skill and source of capital of dairy cattle farmers**

Training skill and source of capital of cow rearing farmers are presented in Table 1. All the farmers

received training from SDF district and regional livelihood officers in collaboration with Livestock department. They have practiced cow rearing as their family profession. All the farmers received loan from their GS office to purchase cattle and some of them used their own cattle for this program.

**Purchasing ability of cow rearing farmers and duration of rearing dairy cattle**

The purchasing ability of dairy cattle and the duration of rearing dairy cattle are presented in Table 1. Most of farmers purchased one dairy cattle in studied area and during of cow rearing was 12 months of second cycle production stage. From Table 1 loan recovery rate was 98-100%. The recovery rate of Grameen Bank was 97% (Mamun et al., 2002).

**Availability of feeds and fodders in the selected locations**

Availability of feeds and fodders and their usage are presented in Table 2. Various types of feed ingredients were used in study areas for dairy cattle. The common ingredients were roadside green grass, wheat bran, rice bran and tree leaves. All farmers used sesame oil cake as protein source for dairy cattle. The farmers were mainly depended on green grasses and tree leaves because of their availability. More than 90% farmers used fodders and tree leaves and 100% farmers reported that feeds are available in selected areas.

**Feeding system**

The feeding system of dairy cattle in studied areas is presented in Table 2. The farmers were practiced semi intensive (67%) and extensive (33%) system in studied areas.

Table 1. Status of cow rearing farmers and duration rearing dairy cattle in studied areas

Parameter	Category	Frequency	Percent (%)
Age	Middle aged (30-40)	9	75
	Old aged (>40)	3	25
	Total	12	100
Education	Primary	10	83
	Bellow SSC	2	17
	Total	12	100
Occupation	Beef cattle only	12	100
	Dairying only	12	100
	Crop farming	4	33
	Goat	5	42
	Total	12	100
Training skill	With training	12	100
	Total	12	100
Source of capital	Loan from SDF	12	100
	Total	12	100
Purchasing capacity	1 dairy cattle	12	100
	2 dairy cattle	0	0
	Total	12	100
Duration of rearing	One year	12	100
	Total	12	100
Repayment rate	98-100%	12	100
	Total	12	100

Table 2. Availability of feeds and fodders and feeding system in studied areas

Types of feeds	Frequency	Percent
Roadside grass (Durba, Helencha, Noll)	12	100
Cultivated fodders (Napier, Maize, Sugarcane top, rice straw)	12	100
Tree leaves (Jackfruit, Banana, and Bamboo etc.)	10	83
Sesame oilcake , rice bran	12	100
<b>Feeding System</b>		
Extensive	4	33
Semi-intensive	8	67
Intensive	0	0
Total	12	100

Table 3. Chemical composition of feedstuffs in studied areas (% DM)

Name of feedstuffs	CP	CF	EE	NFE	Ash
Durba	15.6	22.1	4.1	46.3	10.5
Helencha	20.2	15.5	14.3	43.6	6.2
Noll grass	9.7	16.0	3.9	57.8	12.6
Napier	9.4	12.7	3.6	67.1	5.6
Miaze	12.0	16.4	10.4	49.4	12.2
Jackfruit	20.2	10.0	11.4	50.5	6.5
Sesame oilcake	22.6	11.3	25.6	30.2	7.4

Durba and Helencha were found higher CP compared to other unconventional grasses (Table 3). CP content of feed stuffs in study areas is comparable and even higher than those of other unconventional fodder leaves and higher than the minimum range of NRC for high producing dairy cows (190g/kg). Taher et al. (2002) reported that DM and CP of rice straw and wheat bran were 910 & 890 and 121 & 131g/kg respectively. Pathol (1994) reported that DM and CP of sesame oil cake were 900 and 370g/kg. Hossain et al., (2016) reported that DM and CP of sesame oil cake were 890 and 311g/kg, respectively which are almost similar with this study. CF content of feed stuffs was lower indicated a good quality feed for dairy cattle. The presence of high CF in feeds is reported to decrease dry matter digestible in animals and therefore, provides a good indication of the nutritional value of feeds. The highest EE content was recorded in Sesame oilcake (25.6%) and lowest was found in Noll grass (3.9%) and Napier grass (3.6%), respectively.

#### Major diseases of dairy cattle

Major diseases of dairy cattle in the studied areas are presented in Table 4. Four major diseases were found where the occurrences of anthrax 100%, followed by Black quarter, FMD and Hemorrhagic septicemia.

#### Vaccination, de-worming and sources

The diseases, vaccination practice and source of vaccines are presented in Table 4. 100% farmers performed vaccination (Anthrax, FMD, BQ and HS) and de-worming tablets to their cattle like Endex, Levex etc. collected from local market.

Table 4. Health care practices of dairy cattle in studied areas

Name of diseases	Frequency	Percent
Anthrax	12	100
Foot and mouth disease (FMD)	9	75
Black quarter	10	83
Hemorrhagic septicemia)	8	67
Total	12	00
<b>Vaccination and de-worming</b>		
Yes	12	100
No	0	0
Total	12	100
<b>De-worming</b>		
Sources of vaccines and de-worming tablets		
Local market	12	100
Livestock office	0	0

#### Cost of dairy cattle

Cost of dairy cattle is presented in Table 5. Price of cows varies according to the size, color and utility. Price of one cattle for dairying purpose ranged from 24000-47000 BDT in studied areas. Cost of feeding, breeding, housing, equipment and healthcare of cows are presented in Table 6. To analyze the cost return, it is necessary to describe the feed cost, breeding cost, housing cost and equipment for dairy cattle rearing. Cost per year of housing and equipment was more or less similar with feed cost. The major cost of healthcare is medicinal cost followed by vaccination program. Some Local Service Provider (LSP) of study areas were engaged to serve several programs on vaccination, de-worming and treatment. All LSP were well trained by SDF as training of trainers (TOT) on Para vet build up program and they are certificate holder. As a result it was very helpful to cow rearing farmers of these areas. Average rearing cost of one dairy cattle was 13500 BDT. Sarker et al., (2013)

reported that average rearing cost of buffalo was 5070 which was less than this study.

Table 5. Cost of one cow

Cost per cattle(BDT)	Frequency	Percent
24000-35000	4	33
39000-44000	5	42
45000-47000	3	25
Total	12	100

Average cattle cost 39314 Bangladesh taka (BDT)

Table 6. Different cost of per cow in studied areas

Category	Expenditure (BDT)
Average feed cost (12 month)	9500
Average housing and equipment cost(12 month)	1200
Total	10700
Medicine and vaccine cost	
Average medicine cost (12month)	2000
Average vaccine cost (12 month)	800
Total healthcare cost	2800
Total rearing cost	13500

Table 8. Total and net income from dairy cattle rearing in studied areas

Category	Income	Minimum (BDT)	Maximum (BDT)
Milk sale	56700	47400	66000
Cow dung sale	1550	900	2200
Total	58250	48300	8200
Total expenditure			13500
Net income			54700

Table 9. Impact of cow rearing on livelihood activities in studied areas

Category	Initial value(BDT)	Final value(BDT)	Percent	Ranking
Food purchasing	8400	12800	34.38	1
Cloth purchasing	1005	1450	31.00	2
Social status	1500	2000	25.00	3
Health care	800	1000	20.00	4
Education	1000	1200	17.00	5
Housing	450	525	14.28	6

### Total and net income from dairy cattle rearing

Total and net income per cow rearing is presented in Table 8. The average income and net income from per cow was 58250 and 54700 BDT, respectively. In India, net annual income from rearing one cross breed cow and one buffalo was Rs. 30784 per year (Kalash et al., 2009) which was not similar with this study indicated that rearing dairy cattle in studied areas were profitable.

From Table 8 net income 54700 BDT is shown excluding cow and present calf cost. Farmers are well equipped by practicing of cow rearing and leaning mistaken from 1<sup>st</sup> milking cycle of cow and find legal market and sale their products to actual consumer avoiding market actors. They signed a MOU with milk vita to ensure proper price for their products and established chilling plant for milk preserved. They maintained strong linkage with well known market and consumers for their milk to

### Cost of farmers family members

Average expenditure of per farmer every 12 month is presented in Table 7. Food cost was found highest among the total expenditure. The second highest expenditure was to maintain social status followed by the cost for clothing, education, healthcare, and housing.

Table 7. Average expenditure (BDT) per farmer per 12 month in studied areas

Category	Average expenditure	Minimum	Maximum
Food	8400	7800	9000
Cloth	1005	610	1400
House	450	300	600
Education	1000	600	1400
Healthcare	800	600	1000
MSS	1500	1000	2000

MSS= maintaining social status (decoration, gift, furniture, recreation, attend various festival, invitation, Bangle New Year celebration etc.)

ensure real price. Their mental strength were strong and well known to all rearing practicing, medication and well communicated to Upazila Livestock Office and other service providers. As a result they were more benefitted to cow rearing in studied areas.

### Livelihood improvement of cow rearing farmers

Cow raring increased livelihood status of farmers especially for the farm women and the development of this sector is the potential path to rural prosperity (Kalash et al., 2009).

### Impact of purchase capacity

The food and cloth purchasing capacity of fattening farmers are presented in Table 9. Before rearing cow, farmers spent only 8400 for purchasing food but they were able to spent 12800 BDT after they have started rearing cow which was 34.38% more

than the previous state. On the other hand, farmers spent only 1005 for purchasing cloths but they were able to spend 1450 BDT after they have started rearing fattening cattle, which was 31 % more than previous state.

### Impact of social status, education and healthcare

The impact on social status, education and healthcare are presented in table 9. Before rearing cow, farmers were able to spent only 1500. 1000 and 800 BDT to keep their social status, education and health care but they were able to spent 2000, 1200 and 1000 BDT for maintaining their social status, education and healthcare after they have started rearing fattening cattle, which was 25.00, 17.00, and 20.00%, respectively more than previous state.

### Impact on housing

The impact on housing is presented in Table 9. Before rearing cow, farmers spent only 450 for their housing purpose but they were able to spent 525 BDT for their housing after they have started rearing dairy cattle, which was 14.28% more than the previous state indicated that cow rearing farmers are less interested to spent money for housing rather than other purposes.

### Conclusions

The result indicated that drastic livelihood increased through the rearing of dairy cattle in studied areas. Considering all this parameters studied, cow rearing program is a profitable practices in the selected areas and improvement the socio- economic status and their livelihood of dairy cattle women and loan recovery rate was better than that of other microfinance institutions due to better income generation through applied good livestock management practices and improved scientific approaches and technology. Skill Development training and refreshers training need to be better awareness and improvement of socio- economic status for women and also need to help the male partner of the family for better livelihood.

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