Impacts of Dairy Cooperative on Rural Income Generation in Bangladesh

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Abstract

The purpose of this paper is to highlight how small dairy farmers in Bangladesh are collectively operating their dairy farming and generating employment for better earnings through a cooperative system. Adopting new technology in agriculture and providing an efficient marketing system is a complex process in developing countries where the majority of farmers are in subsistence level of farming. However, with democratic organization, a cooperative can play a vital role for the poor rural farmers in better access to such technology and fair market price for their products.

1. Introduction

Bangladesh is primarily an agrarian society with 80 per cent of her population living in rural areas. Agriculture is considered the predominant income source for rural inhabitants, contributing 29.8 per cent to GDP and absorbing more than 63.2 per cent of the labor force (Bangladesh Bureau of Statistics, 1997). The rural land distribution is very skewed, with more than 60 per cent of rural people being functionally landless and surviving as day laborers. Some of them depend on various non-farm activities, which cannot ensure a livelihood above a subsistence level. The main problem remains with the unemployed and redundant labor force, termed as "parasitic" portion of the population, unable to make any productive contribution to the economy of the country (Fei & Gustav, 1964). Labor Force Survey in Bangladesh (1995-96) shows that the labor participation rate is only 64 per cent. Thus, crop production alone is not sufficient to provide employment for this large population.

Dairy, fisheries and forestry are other components of agriculture with great unexplored potential. So there is a need to pay more attention to these agriculture activities. In this, dairy farming can be the viable alternative to enhance the economic conditions of the farmers. Bangladesh Bureau of Statistics (1994), has shown that a very high percentage of cattle (50.9%) are owned by small farmers as compared to the medium farmers (37.3%) and large farmers (10.2%). In this context, dairy farming is able

to bring the well being to the vast majority. Dairy farming is a labor-intensive productive work, which can generate employment opportunities for the rural poor, and this is one of the main objectives of rural development. Dairy provides a viable subsidiary occupation for the unemployed rural poor so as to raise their income earning capacities (Kulandaiswamy, 1986). Thus, any systematic step towards dairy development can play a vital role in improving rural economy of the developing countries like Bangladesh. Although the Bangladesh Government extension department was expected to play an important role by providing available facilities and services such as artificial insemination, supplementary feed, medication, and fair pricing system to the poor farmers, no such provision has been done so far. The reason is that Government has livestock development offices in District/*Thana* level (administrative units) and all are established in urban area. It is not easy to access these services for the rural poor. On the other hand, lack of veterinarians, medicine, and other facilities have made the system inefficient. The poor farmers suffer from lack of capital and do not have any financial support. These unorganized farmers are also unable to get the proper price for their products due to the seasonal and regional variations of the market price.

Under these circumstances dairy cooperatives are playing a vital role in income generating activities by resource pooling, cooperating and joint marketing, which ultimately affect the socio-economic condition of the rural poor. So the main objective of this study is to ascertain the role of cooperatives in improving the socio-economic conditions of dairy farmers.

For this, the socio economic aspects of cooperative dairy farmer will be analyzed in this paper. This will be done in regards to the size of milk cow holding and its relation with landholding including landless and the nature of dairy farming in using their limited resources and family labor. It will also analyze the contribution of cooperative dairy farming in income generation and consumption at the household level through comparative analysis of cooperative and non-cooperative farmers.

2. Dairy Farming and Cooperative in Bangladesh

2.1 Present Status of Dairy in Bangladesh

Although dairy is an important source of income for the rural poor, unfortunately the condition of dairy in Bangladesh is not healthy. According to the livestock and poultry survey in 1988-89, there are 20.36 million cows in Bangladesh. These are mainly *Bos Indicus* (*Zebu*), which are generally small in size and slow, in growth. They are low in weight and produce comparatively less milk. The reasons behind these are said to be;

i) indigenous species.
ii) usually fed with residues of crops instead of green grasses, concentrates and supplementary feed, and
iii) lack of proper medication

The indigenous cows however, have some favorable characteristics such as low maintenance cost, strong resistance to the local diseases and are adaptive to the local environment. But these low productive cows are not suitable for commercial milk production.

The density of cattle population is comparatively higher in Bangladesh compared to other neighboring countries. However, there is a problem of low productivity of the cattle in terms of milk and meat production. The best policy could upgrade the cattle species by artificial insemination and supply of the necessary inputs to the rural areas where most of the cows are found. Most of the rural households keep cattle in order to produce milk for family consumption and to cultivate their land. The population of

rural areas is mostly poor and landless, and the raising of cows is done in a very traditional way without any special care. Although there is a general trend to maintain cows in Bangladesh, the rural people have not yet undertaken dairy on a commercial scale. Recently people in rural areas are trying to diversify their income sources to ensure their livelihood. In this process dairy is looked upon as a viable alternative. Keeping these immediate goals social organizations like cooperatives are playing an important role in the development of the dairy sector. Poor farmers are carrying out their dairy farming on a cooperative basis and are producing a large amount of milk. They have set up their own milk processing centers, own veterinary services and milk marketing channels and established their own transportation system with the assistance of the Government. The Government loan was given to the Central Cooperative Union for establishing the dairy infrastructure, such as transportation system, processing centers, and factory. The Government's aim was to ensure the good returns for the rural dairy farmers.

2.2 Cooperative in Bangladesh

Cooperation and competition are two basic social processes and fundamental theme of sociological literature. However, for an agrarian developing country cooperation can act as an effective and efficient instrument to bring positive socio-economic changes for the masses. Cooperation in its modern perspective started in British India (Bangladesh was a part) with the enactment of the Cooperative Societies Act. of 1904. The main aim was to provide cheap credit to the farmers. Thus cooperative in Bangladesh is not a new concept. After independence in 1971, the cooperatives gained popularity to some extent. But it could not significantly fulfil their basic aims such as agriculture development and the income generation for the rural poor people (Ahmed, 1989).

2.3 Recent Development of Dairy Cooperative in Bangladesh

The basic mechanism of the cooperative could be the capital formation by productive work, and the development of infrastructure such as agriculture crop storage, transportation, and the stability of the market. To do so, it needs to provide loans to the cooperative, rather than the individual cooperative members. Bangladesh Milk Producers' Cooperative Union Ltd. (BMPCUL), a newly emerging unique type of cooperative, is not providing any significant amount of credits to the individual dairy farmers, but is functioning as an agent of income generation for the dairy farmers. The Government took initiatives to organize poor dairy farmers under a cooperative umbrella (BMPCUL), in which the Government gave credit to establish the dairy infrastructures such as, milk processing centers, factory and veterinary services, transportation and a stable market. BMPCUL started its function with the aims of establishing a dairy base in Bangladesh as well as rural development by providing inputs to the farmers at low cost and ensuring fair price to the small rural milk producers. Presently the BMPCUL has been running seven dairy plants for processing and/or pasteurizing at Dhaka, Baghabarighat, Tangail, Manikganj, Tekerhat, Sreenagar and Rangpur region.

In 1946 a dairy plant with a processing capacity of 2,000 liters of milk per day was established by National Nutrients Company at Lahirimohanpur, Pabna district (presently Serajganj district) with the target to send milk products through railroad to Calcutta (India) market, (Haque, 1998). However, this could not be materialized due to the partition of India and Pakistan. Thereafter, in 1952, Eastern Milk Producers Limited, a private company, purchased this dairy plant from the original owner. Within a couple of years the plant started its production activities and marketed butter, *ghee* (one type of butter), cheese and powder milk under the trade name of Milk Vita. Even with all-round efforts by the owner of

the company, regarded as pioneer of dairying in the country the plant could not attain the level of proven success. As a result, in 1965, its ownership was transferred to newly formed first Milk Producers Cooperative Union, under the name of Eastern Milk Producers Cooperative Union Limited (EMPCUL). Around the plant at Lahirimohanpur about 100 village milk producers' cooperative societies were formed for the collection of milk needed by the plant (Hanif, 1996 and Haque, 1998).

In 1973, soon after the liberation, the Government of the People' Republic Of Bangladesh undertook a development scheme titled Cooperative Dairy Complex based on the recommendations from United Nations Development Program, Danish Agency for Development Assistance (DANIDA) and Food and Agriculture Organization of the United Nations. The scheme had the proposal of establishing dairy plants in some milk surplus area of the country, ie. Tangail, Manikganj, Tekerhat, Baghabarighat with a city plant at Dhaka. Taking over the overall responsibilities, viz; debts, assets and liabilities of the previous dairy plant, the EMPCUL changed its name Milk Producers Cooperative Union Ltd. in 1977. However, the brand name of the products remained same. Under a bilateral loan agreement with DANIDA, the Government awarded a contract to Danish Turkey Dairy of Denmark (DTD) to plan designs and established 5 dairy plants. DTD supplied the machinery and all the 5 dairy plants were established within the project period (1973-1978). The total cost of the project amounted to TK.155.61 million. The plants, though donated by DANIDA to the government, were given to the milk union as a loan. Around this plant area, there were about 335 primary milk producers' cooperatives with membership of over 28 thousand small and landless farmers. They supplied milk at a daily average of 6 million liters, by which the Milk Union produces butter, cheese, ice cream, milk powder, pasteurized milk, etc., and marketed these products under the brand name of Milk Vita. The union conducted cattle development program comprising supply of improved semen, mobile veterinary services, feed and fodder. The Primary Milk Producers Cooperative, which was self-reliant with little or no financial support under the project, earned TK. 650 (U.S. $ 1 = TK.54, in the year of 2001) million in 1997-98 and distributed patronage refund to members. The Milk Union, through its primary milk producer's cooperatives, had thus created additional earning opportunity for the poor and contributed to national health and nutrition by providing fresh milk and milk products to the urban dwellers (Haque, 1998 and Hanif, 1996).

2.4 Milk Vita, Management Affairs

Bangladesh Milk Producers Cooperative Union Ltd. (BMPCUL) so long have operated under a civil service administration system, governed by cooperative principles, rules and by-laws, rather than on commercial concepts and practices. Its Chief Executive had always deputed from senior administrative cadre of the government. But some major changes in the overall policy of BMPCUL have appeared in recent years. The major administrative reform was made in 1991, by employing a professional Chief Executive in place of Government deputation and adopting appropriate policies and measures to produce more milk (Haque, 1998). A managing committee consisting of nine members runs BMPCUL. It is an honorary position and comprises of six members elected from the village primary milk producers' cooperatives and with three nominated members from the Government. The presidents of all primary milk producers' cooperatives at the village level directly elect the chairman.

A Village Milk Producer Cooperative consists of one to three villages covering an area of approximately 1-2 sq. miles, having a marketing surplus of 180-200 litres of milk per day. To establish a cooperative first the group of dairy farmers needs to inform the BMPCUL regional authority of their intentions. Generally, the authority considers the first year as the observation period. At that time the

authority verifies the milk production capacity of this group. If the group can fulfill their required amount of milk production then it will be formally registered as a cooperative under the BMPCUL system. The **Fig-1** shows individual producer farmers are making village level cooperatives. A number of cooperatives together constitute a milk shed area. All milk shed areas are under the BMPCUL.

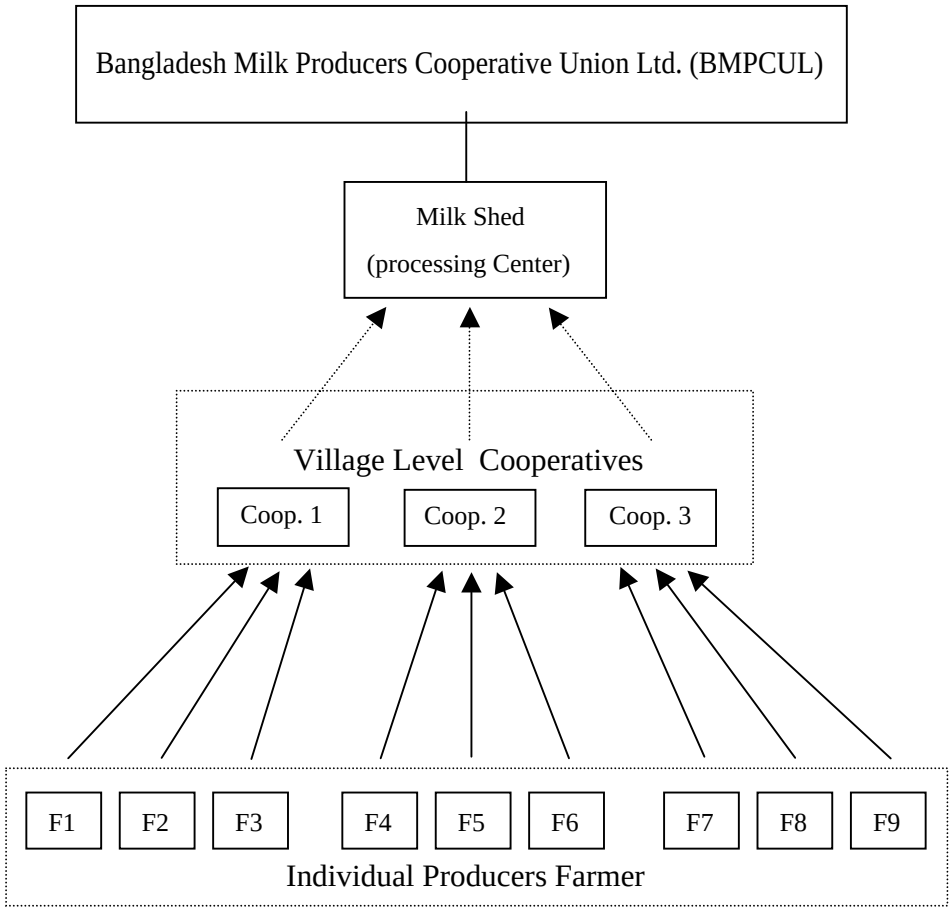

Fig-1. Bangladesh Milk Producers Cooperative Union Limited (BMPCUL)

Before the cooperative was formed, farmers had to depend on middlemen to market their milk and as a result they were exploited in various ways. Not only were they paid low price but also cheated in weighing. To improve the situations, the BMPCUL has been helping the rural milk producers in organizing their own village Primary Milk Producers Cooperative so that they can help themselves and become responsible for marketing their own milk. They no longer have to depend upon middlemen and a relatively unstable market.

3. Field Study

In order to understand these changes and the consequences a detailed field study was conducted. The main objective of the study is to ascertain the role of cooperatives in improving the socio-economic conditions of dairy farmers. Out of seven milk-shed areas, Baghabarighat milk-shed area, in Shirajganj district, Northwest from Dhaka, where the first dairy cooperative was established which formed the base of the dairy cooperative in Bangladesh, was chosen for this study. This milk-shed consists of 163 primary village cooperatives. The data and the information for the analysis was collected in two different methods: General survey for the cooperative members and case study for both cooperative members and non-cooperative villagers in the same village.

The milk-shed area is divided into nine Thanas (administrative units). Out of them, one Shahjadpur Thana was selected for study as it was regarded to represent the whole milk shed area. In this Thana, some cooperatives are with grazing land facilities and some are not. Some cooperatives have good transportation facilities and others do not, boat being the only means of transportation. The other 8 Thanas do not posses all these conditions, do not have these facilities and hence not represent the whole milk-shed area.

Further, out of 35 cooperatives in Shahjadpur Thana, 3 cooperatives, named Potajia, Ratankandi, and Chara Chethoria were selected. Special consideration (such as production of milk, grazing land, means of communication) was given to the selection process so that these cooperatives can be representative for this Thana. Considering the milk production, each of these three cooperatives were taken from three different milk producing groups on the basis of high, medium and low milk production. The means of transportation was considered, as well. One cooperative could be reached only by boat, another one by *riksa* (3 wheeled bicycle) and the third one by boat and *riksa*. Another criterion considered was grazing land. One cooperative having grazing land was selected. Another with partial grazing land and the third one without grazing land was selected. From each of the sampled cooperative villages, 40% of member households were randomly sampled. The sample together comprised 152 from three different cooperatives. Personal interviews were conducted through the use of a structured questionnaire; general survey.

The case study method was applied to know the detailed household income composition. The questionnaire for this purpose was designed as such that data for comparing income and the consumption among the cooperative members and non-members general villagers could be done. For the case study, one cooperative village mentioned above (Potajia) was taken. All together, 80 households (40 households from cooperative and another 40 households from non-cooperative) were purposively taken so that it equally includes all type of farmers; i.e. landless, small and medium and large farmers.

It has to be reminded here that all information used in this analysis is collected personally, participatory way through interviews, observation and investigations. Precaution has been taken to maintain objectivity and to keep the study free from various biases. For this purpose, the author visited all the households and interviewed the people in the absence of Milk Vita's officials so that the farmers can directly express their views. However, in spite of these, some limitations could not be avoided. Unavailability of printed information has led to give greater importance on verbal interviews of the farmers who are not only illiterate but also have never had such experiences of giving interviews, talking logically for fairly long time. The information thus collected was often diagnosis and it was difficult to rationalize farmers' activities on the basis of this information alone. However these limitations were checked cautiously with review work, cross checks, participatory observation and re-interviews.

Secondary information was collected from the official records; printed reports, brochures, and pamphlets, as per need for the analysis.

4. Implication of Dairy Farming for Dairy Cooperative Members

4.1 Socio-economic Characteristics of the Dairy Farmers

Sirajganj is an agriculture-based district like many other districts in Bangladesh. Literacy rate of the people is very low (27%, BBS 1995). Major rivers surround the district, making it a water-logged district, which is under the water for more than four months. In rainy season, the sampled area is either fully flooded or some of its part is visible where people can find some dry places as if those "dry places" are some kind of islands in the sea. This sort of geographic as well as environmental conditions make their cropping cycle limited to two crops, mostly rice and winter crops such as oil seeds and pulses. This is the very reason, which makes their life rather difficult as it lessens the employment opportunities in non-farming sector as well. As a result, the poor people look for other alternative ways to support their livelihood. In this context dairy farming becomes one of their important options.

4.2 Land and Cow Holding

In the rural area of Bangladesh, land is the symbol of power, social dignity and economic status in the society. The people with land have better access to agriculture inputs, credit and better income sources. Table -1 shows that distribution of land and milk cow holdings in study area. It reveals that 22% of the dairy cooperative households are functionally landless with landholding up to 0.49 acre. Major portions of the cooperative households (45%) are small farmers with landholding of 0.50-2.49 acres. The middle farmers with landholding of 2.50-7.49 acres constitute 22 percent. Only a small percentage (11) is large farmers with landholding more than 7.50 acres. It means that the rural land distribution is very skewed. The poor farmer consequently has to meet their subsistence needs by seeking employment opportunity elsewhere.

Table-1: Land and milk-cow holding according to farm categories for dairy cooperative members

Farm category	Household number	Total land holding(In acre)	Total milk cow holding(number)
Landless	34(22.37)	4.01(0.69)	61(11.64)
Small	68 (44.74)	99.42(17.05)	213(40.65)
Medium	33 (21.71)	141.8 0(24.31)	130 (24.81)
Large	17 (11.18)	338.00(57.95)	120 (22.90)
Total	152 (100.00)	583.23 (100.00)	524 (100.00)

Source: Field survey, 1998, 2000

Note: (1) Landless is with 0.0 - 0.49 acres of land, small farm is with 0.50 - 2.49, medium farm is with 2.50 - 7.49 and large farm with 7.50 and above acres of land.

(2) Figures indicate ( ) denotes percentage.

The same table reveals that the landless, the bottom 22% farmers, have only a very negligible amount of land (0.69%), however, they own 12% of the total milk cow. The small farmers hold only 17% of total land, but they own 41% of milk cow. The medium farmers own 24% of land and also possess nearly same percentage (25%) of milk cow. But large farmer the top 11 percent having more than half of the land (58%) possess only 23% of milk cow. Thus the possession of milk-cows has less accumula-

tive nature than possession of land, indicating that dairy farming can be more remunerative for the rural poor and that development of dairy will better ensure the equity among different categories of farmers.

4.3 Labor Utilization

In order to raise a cow one needs to look after it everyday. Thus various kinds of work, i.e. feeding and grazing the cows, watering and cleaning, maintaing cow shed, checking the health of cow, milking the cow, selling and processing of milk and so on. Thus cow raising generates work through out the year. A cow generates 130 mandays of employment opportunity per year among landless farm (**Table-2**). For the small, medium and large farmer it is generating 125, 108 and 80 mandays, respectively. According to the cattle holding size, landless farmers are using 243 mandays labor, small farmers are using 389 mandays labor, and medium and large farmers are investing 423 and 573 mandays labor, respectively. Thus the labor utilization per cow decreases gradually with the increase in cow holding.

Table-2: Labor utilization in dairy farming according to farm categories

Farm Category	Average cow holding	Total manday labor	Manday labor per cow	Family labor (%)				Employed labor (%)
				Total	Male	Female	Child	Total
Landless	1.8	243.6	130.4	95	38	51	6	5
Small	3.1	389.4	125.6	92	46	43	3	8
Medium	3.9	423.5	108.6	95	59	34	2	5
Large	7.1	573.5	80.8	42	36	6	0	58

Source: Field survey, 1998, 2000.

Note: (1) Mandy: One manday=8 hours work of an adult per day.

(2) The labor use of male, female, and child is calculated only for family labor, i.e., employed labor is excluded

(3) Farm category is defined in Table -1

Data reveal from the same table that landless, small and medium farms are mostly using family labor, each above 90%. Where as large farm is using more of the employed labor. Their family labor used in dairy farming is only 42% of the total labor needed. Same data also reveal the nature of labor utilization among different farm categories. Landless farm uses 51% of the female labor, small and medium farms are using 43% and 34% respectively. But the large farms almost do not use female labor. The case of child labor (9-12 years old) use was very insignificant in all farms and is reducing gradually according to farm size. The rate of family labor use is higher for the landless and small farmers than the larger ones.

Thus, it can be said that the work generated by cow holding is absorbed by family labor, including females in landless, small and medium farm categories which otherwise would remains unutilized. Thus, cow holding contributes in both, use of family labor and lessening disguised unemployment and underemployment.

4.4 Gross Income

Most of the farmers from rural areas try to diversify their sources of income for their livelihood. A landless and small farmers have a small amount of land so their earnings are mostly from dairy, and other income earned from small business, daily wage and sometimes low paid services. On the other hand large farmers have a stable income from their land. **Table-3** shows the percentage of gross income from dairy and other sources. Data reveal that landless and small farms are earning a substantial share more than 40% of their income through dairy farming. Farmers in medium and large categories earn

38% and 22% of total in come, respectively, from their dairy farming.

Table-3: Share of gross income from dairy and other sources

Farm Category	Income from Dairy (%)	Income from other sources(%)
Landless	43	57
Small	44	56
Medium	38	62
Large	22	78

Source: Field survey, 1998, 2000.

Note: (1) Other sources include, crop production, non-farm job, day laboring and all other economic activities.
(2) Farm category is same as Table-1

5. Comparative Analysis of Dairy Cooperative Members and Non- members

5.1 Occupation structure

The main occupation of the family is considered as the one from which most of the family income is earned. **Table-4** shows the occupation structure and the availability of employment opportunity among dairy cooperative and non-cooperative farmers. Data reveal that 57% and 22% percent of the non-cooperative households take crop production as the primary and the secondary source of income, respectively. For the cooperative households only 30% and 35% of the farmers take it as their primary and the secondary source of income, respectively. Among cooperative households, 33% and 43% take dairy as their primary and secondary source of income, respectively. However, the non-cooperative farmers are not engaged in dairy farming. Comparatively a large number of non-cooperative households (each 20%) are engaged in day laboring both as primary and secondary income sources. Where as they are very few among cooperative households. In case of salaried work, business and other jobs, there was no significant difference between non-cooperative and cooperative members. But it is found that relatively large percentage of households from cooperative have secondary (95%) and tertiary (38%) sources of income. The same figures for the non-cooperative households are comparatively small, 70% for secondary and 23% for tertiary sources of income. This difference is primarily due to difference in having dairy as a secondary or tertiary job among the cooperative households.

Table-4: Occupation structure among cooperative and non-cooperative farming households

Occupation	Cooperative households (%)			Non-cooperative households (%)		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Crop production	30.0	35.0	12.5	57.5	22.5	2.5
Dairy	32.5	42.5	22.5	0.0	0.0	0.0
Day laboring	7.5	2.5	0.0	20.0	20.0	5.0
Salaried work	12.5	2.5	0.0	10.0	5.0	2.5
Business	10.0	7.5	2.5	7.5	7.5	10.0
Other jobs	7.5	5	0.0	5.0	15.0	2.5
Total	100.0	95.0	37.5	100	70.0	22.5

Source: Field survey, 1998, 2000.

5.2 Household Income:

Table-5 shows the cooperative dairy household monthly income compared with the monthly income level of non-cooperative farmers as well as national rural income. Data reveal that among non-cooperative households, a large share, (31%) falls into the income group of Tk. 1249, whereas, only a little, (4%) of the cooperative households falls into this income group. For national level, the figure is 14%. This indicates that the income status of large number of non-cooperative households; general farmers is lower than that of national level. About the same proportion of households both form non-cooperative (29%) and cooperative (30%) households fall into the income category of 1250 - 2999. Where as in national level 47 % falls into this income group. For the income level, 3000 - 6999, relatively large parentage of households (45%) from cooperative, but only lesser percentages from non-cooperative (32%) and national level (33%). Comparatively, a less proportion of households (4%) from non-cooperative as well as national level fall in the higher income group of 7000 - 12499. However, 13% of the cooperative households fall into this income category. Similar trend can be seen in the highest income group (12500 and above). The data show that the cooperative member households tend to have higher level of income than non-cooperative household and much higher than the national figures.

Table-5: Monthly household income at national level and, cooperative and non-cooperative households in the study area

Income group	Percentage of households National (Rural)	Percentage of households in non-cooperative	Percentage of households in cooperative
＞1249	14.5	31.0	4.0
1250 - 2999	47.2	28.7	29.6
3000 - 6999	32.6	31.6	45.4
7000 - 12499	4.6	4.4	13.1
12500 +	1.1	4.3	7.9
Total percentage	100.0	100.0	100.0

Source: BBS-1995 & Field survey, 1998, 2000.

5.3 Household consumption

The farmers engaged in dairy farming are consuming more foodstuffs than non-cooperative farmers. **Table-6** shows the average per capita food intake (per day) by cooperative households compared with non-cooperative households.

Table-6: Per capita average daily food intake among cooperative and non-cooperative households

Items	Cooperative households	Non-coop. Households
Rice (gm.)	810	790
Meat (gm.)	26	10
Milk (ml.)	210	40
Fish (gm.)	120	100
Dal/beans (gm.)	30	45
Eggs (numbers)	0.19	0.1

Source: Field survey, 1998, 2000.

Data reveal that the daily rice intakes for cooperative households are 810 grams not much different from 790 grams, for the non-cooperative households. But per capita daily milk consumption is 210 ml.,

very high, for the cooperative households compared to 40 ml. for the non-cooperative households. The consumption of meat in cooperative households is also higher (26grams) than non-cooperative households. This trend is also observed for fish and eggs consumption. However, per capita dal (beans) consumption is less (30 gm) for cooperative households than the non-cooperative households (45gm). Beans are being used in household consumption as the substitute for meat, eggs and fish, especially among the lower income group not being able to afford meat and fish as a source of protein.

6. Future Prospects of Dairy Cooperative

Table-7 shows the development of cooperative activities in the Baghabarighat milk shed area. Data reveal that the number of cooperatives and of the members have increased substantially within the period of 1991/92 to 1997/98. In 1991/92, there were only 99 cooperatives with 8,311 members, but in 1997/98, the total number of cooperatives and their members have increased gradually and reached 163 and 13825, respectively.

Table-7: Development of dairy cooperative activities in Baghabarighat milk shed area 1991/92-1997/98.

Items	Year						
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
No. of primary cooperative	99	105	134	142	152	161	163
No. of Members	8,311	8,810	10,801	11,953	13,478	13,778	13,825
Milk collection (in litre)	4,868,614	7,700,263	9,627,029	12,946,697	14,862,364	15,116,976	*
No. milking cows	9,015	12,222	15,280	17,981	18,000	20,000	25,000

Source: From Bagabarighat cooperative office, general section.
Note: '*' denotes, data is not available.

The total milk production in 1991/92 was less than five million litres, the production gradually increased and it became fifteen million litres in the year 1996/97. Not only the milk production, but also the number of milking cows has increased about three- fold within the past 7 years. Same trend is observed for the number of cooperative as well as their members.

Table-8 shows the development of cooperative activities in case study area. Data reveal that the cooperative members gradually increased every year. In 1991/92, there were 104 cooperative members and in 1998/99, it increased three folds to 307. The same trend is observed for milk production and the

Table-8: Development of cooperative dairy activities in Potajia 1991/92-1998/99

Items	Years							
	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99
No. Of Members	104	127	147	162	197	216	268	307
Milk collection (in litre)	175,674	234,062	322,411	491,500	512,241	520,872	669,408	815,631
Income from milk selling (in Tk.)	2,024,843	2,758,738	3,784,891	6,299,480	6,934,409	7,600,102	9,504,071	11,504,047
No. Milk cows	511	564	598	627	737	806	865	904
No. Of cows	961	1,033	1,172	1,262	1,347	1,449	1,559	1,647
No. Of calves (by insemination)	53	115	66	77	254	218	262	230

Source: From Potajia, cooperative office, general section

income generation. In 1991/92, the total milk production was 175,674 litres and the income from it was Tk. 2,024,843. But, milk production and the income increased substantially by 1998/99, and became 815,631 liters and Tk. 11,504,047, respectively. The similar trend is observed for the number of milk cows, number of cows and numbers of calves by artificial insemination.

Table-9 shows the trend of recent changes in milk production in sampled cooperative households. Data reveal that 89% of total households feel that their dairy farming is getting better both qualitatively and quantitatively compared to the situation 5-10 years ago. On the other hand, only 8% of the farmers said that their milk production is decreasing and only very few (3%) farmers think that it has not changed.

Table-9: Recent changes in milk production felt by cooperative dairy farmers

Farmers category	Increase in production	Decrease production	Constant production	Total
Landless farm	17.11	3.95	1.32	22.38
Small Farm	41.45	3.29	0	44.74
Medium Farm	20.39	0.66	0.66	21.71
Large Farm	10.53	0	0.66	11.19
Total	89.48	7.9	2.64	100

Source: Field survey, 1998, 2000

Table-10 Shows that 57 % of the cooperative farmers think price hike of dairy feed is main obstacle for daily farming activities. Another 36% of the dairy farmer face lack of credit to run their dairy farming. Regarding the cooperative semen, 7% of the farmer thinks the supplied semen is of low quality. Very few, only 3%, of farmers wish the fat testing equipment in their milk-collecting center.

Table-10: Farmers view regarding their problem in dairy farming

Farmers View	Number of farmers	Percentage of farmer
Price hikes of dairy feed	77	50.66
Lack of credit	55	36.18
Low quality semen	10	6.58
Lack of fat testing equipment	5	3.29
No response	5	3.29
Total	152	100

Source: Field survey, 1998, 2000

Table- 11 shows that the per capita milk availability is very less in Bangladesh and it is reducing because of population growth and the lack of effective dairy development program. Data reveal that in 1980/81 the per capita (daily) milk availability was only 0.041 litre. It also shows that the per capita milk availability is reducing every year and it reached 0.025 liter by the years of 1993/94. However, the recommended minimum per capita milk consumption should be 250 ml (Alam, 1995). Thus,Bngladesh needs to produce much more milk to meet this gap. Hence, it can be said that the Bangladesh has great potential to develop its dairy sector to meet the national demand. In the process of dairy development, cooperative can contribute significantly by providing supports such as artificial insemination, medication, transportation, better fixed market price for their milk and basic knowledge of dairy farming that lead them to improve their milk consumption level and household economy.

Table-11: Per capita milk availability in Bangladesh from 1980-81 to 1993-94

Years	Per capita milk, yearly (in litre)	Per capita milk daily (in ml.)
1980-81	14.97	41.1
1981-82	14.32	39.2
1982-83	15.41	42.2
1983-84	9.95	27.3
1984-85	10.93	29.9
1985-86	10.71	29.3
1986-87	11.4	31.2
1987-88	10.38	28.4
1988-89	11.04	30.2
1989-90	11.15	30.5
1990-91	10.06	27.6
1991-92	9.4	25.7
1992-93	9.07	24.8
1993-94	9.29	25.4

Source: BBS, 1997
Note: Imported milk is excluded

As shown **Table-9**, the cooperative farmers are very positive about dairy farming and are rather satisfied with daily activities. Very few complain about the cooperative services and they are eager to put more capital in it. Thus there is a great potential for development of dairy farming in Bangladesh. It is noted that, so far milk cooperative covers only few regions in Bangladesh. So it has further scope to expand these activities and cover wide area of the country. The BMPCUL runs their business and sell their products, covering only about 12 districts out of the total 64 district in Bangladesh. With the expansion of cooperatives in numbers and their activities milk production can be encouraged and they can expand their business through out country.

7. Summaries and Conclusion

The findings of this study suggest that agriculture (crop production) is no longer the predominant occupation among the study dairy cooperative members. In fact, dairy has emerged as a parallel occupation. Another trend observed in the study area is the diversification of income sources. The rural households have secondary and tertiary occupations. Thus, this trend of dairy development in farming through cooperative initiatives can play a very significant role in rural development.

Land distribution is very uneven and most of the farmers are functionally landless and a very small percentage of the large farmers possess big portion of the land. This indicates that in order to create gainful activities for the landless and small farmers other farming activities that can combat the emerging problems of the rural society are necessary. Comparison of cows and land holding suggests that cows have no accumulating nature to be concentrated in the hands of very few people. This indicates that dairy farming can be a more contributive activity for the poor rural dwellers.

It is observed that dairy farming is generating about 45% of the total income among the land-poor peasants. Regarding the utilization of labor in dairy farming, almost all farmers are using their unemployed and under employed family labor very efficiently. Half of the labor utilized by landless farmers is female. The percentage of female labor decreases as the size of the farm increases. This shows that

dairy farming efficiently utilizes the otherwise unproductive female labor force, as well.

In respect to the household economy, the income of cooperative households has increased substantially than that of the non-cooperative households, also higher than the national figures. This improvement in income is made possible because most of the dairy farmers joining the cooperatives are generating a substantial income from the dairy farming. The benefits from cooperatives increase the incomes of those living in rural areas. It is found that almost all cooperative members are consuming more milk, meat, fish, and eggs than non-cooperative farmers.

It is also observed that the cooperative activities gradually increased in the study milk-shed area. Not only the number of cooperatives but also the cooperative members and the total number of milk cows have increased. The milk collection of this region has increased dramatically during the last decade. Similarly, case study cooperative has changed and cooperative members, milk production, cow holding and finally the income of the cooperative farmers have increased substantially. Increase in income means further investments can be made in rural areas and the linkage effects will eventually benefit the rural society as a whole.

Poverty is mostly confined to those who are at the lowest ranks of the society. It is this section of the society that has benefited the most from the dairy cooperatives. The regular income earned from the sale of milk has enlarged their perception on savings and investment and also enhanced their levels of aspiration. Dairy cooperatives in Bangladesh are providing a viable means of income generation. It has been continually providing cash income to those living in rural areas.

The per capita milk availability in Bangladesh is very low and reducing gradually mainly due to population growth. But, it was observed that, almost all the dairy farmers perceive that their milk production has been increasing compared to 5-10 years ago. It suggested the potential for the future expansion of dairy activities and meet the national demand.

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