

CHAPTER- I

INTRODUCTION

1.1: Livestock plays an important role in the agricultural economy of Bangladesh. The non-crop agriculture sector has registered significantly higher growth rate over the last few years. The crop sector showed an annual growth rate of 1.2% while fisheries, livestock and forestry sub-sectors experienced 5.3, 5.6 and 4.0% growth rates respectively (Mondal, 1999). Contribution of livestock sub-sector to the GDP was 2.95%, which was estimated about 17.32% GDP to agriculture (DLS, 2010). According to Bangladesh Economic Review (2006) and DLS (2008), per annual growth rate of 7.23% in GDP in 2004-2005 for livestock was the highest in all sub-sectors (Uddin, 2010).

The supply of the domestically produced livestock products (Meat, Milk, Eggs) are increased 1.2% annually (DLS, 2000). About 36% of total animal protein comes from the livestock products in our everyday life. It also helps to earn foreign exchange by exporting hides and skins every year.

As an integral part of agricultural system, livestock has direct impact on income generation, poverty alleviation and meet up of nutritional demand. But the domestic livestock production is inadequate to meet the current demand of milk, meat, eggs and balancing nutritional needs of people.

In Bangladesh, total livestock population is estimated about 23.40, 33.50, 1.11, 0.82, 13.00 and 138.20 million head cattle, goat, sheep, buffalo, ducks and poultry respectively (Reza, 1999). It is the 12th in the world and 3rd in the Asian countries, in terms of relative density of cattle population (Alam et al., 1994). Total cattle population of the country is about 24.5 million, which is about 1.79% of the world and 5.47% of Asian cattle population (FAO, 2004a).

Dairying is the mixed farming system in Bangladesh and it is the strong tools to develop the micro economy in a village (Saadullah, 2008). Most of the cattle in Bangladesh are non-descriptive and low yielding and few crossbred with Shahiwal, Red Chittagong cattle. High yielding crossbred like Jersey and Holstein-Friesian are found in commercial

level. But in my study area most cattle are crossed with Jersey and Hoistein-Friesian. The local cattle yields 300 to 400 Litters of milk per lactation period of 180 to 240 days and the crossbred yields 600 to 800 Litters of milk per lactation of period of 210 to 240 days (Islam, 1992). About 64% milk in Bangladesh comes from cattle (FAO, 2004). But it can fulfill only 13.6% of the total requirement in Bangladesh (BLRI, 2001). The consumption rate also increase 4% per year (Hemme, 2008). The average annual growth rate of cow and buffalo over the period is only 0.31% but the growth rate of human population is 1.8% which is much higher. To fulfill the extra demand, the Bangladesh imports the dairy milk powder from abroad. But the milk production growth was increased from 4.1% to 7.4% per annum in 2000-2005 and 2005-2008 respectively (Hemme, 2008).

Dairying in Bangladesh is growing faster but it also faces a lot of problems of high input and low output prices. The condition leads to lower profitability in dairy farming. Diseases, along with non-availability of feed resources and nutrition are the most important constraints to milk production. However, with the smallholders production systems, the situation is more serious because of inadequate economic indicators such as cost and profitability, research on this aspect is very limited and controversial (Khan, 2007). In Bangladesh, the government, cooperatives, the private sectors and a few non-governmental organizations (NGOs) provide veterinary services and artificial insemination facilities to the dairy farmers. However it is well known that the quality of the veterinary services provided by public sector institution is poor and those institutions providing these services are highly insufficient. Therefore, there is a need to restructure and reorient the livestock health and breeding services and extension services providing institutions.

On here, increasing demand for dairy products will put increasing pressure on dairy production systems. Sustainable dairy farming is not possible with traditional breeds and feeding practices owing to their less productive performance. For these purpose the concept of intensive dairy farming with high yielding crossbreds, intensification of production, animal health issues with a greater reliance of feeds and concentrates are required. In this country, the dairy farming is dependent on crop residues, natural resources and open grazing system as a source of feeds. However, the traditional source of feeds and fodders to support the dairy production is unlikely as available grazing areas and other common property resources are reduced and already degraded. Therefore if

milk production is to increase, then stall feeding system have to follow. For these purpose a good number of small and medium sized dairy farms with the main objective to produce milk have been develop mostly in urban and semi-urban milk pocket areas like , Manikganj, Munshiganj, Kishorganj, Gazipur, Faridpur, Madaripur, Rangpur, Kushtia , Comilla and Chittagong (Shikolbaha, Patiya, Hathazari) district.

The profitability of a dairy farm depends to a greater extent on productive and reproductive performance of the animals. For these reason, the present study was therefore undertaken to investigate the productive and reproductive performances of cows under subsistence, Semi-commercial and commercial farming in Chittagong districts and recommend farmers that are suitable in existing ecological and socio-economic condition.

1.2: Objectives of the study:

The overall objective of the economic condition of small scale dairy farming in farmer's livelihood aspects.

The specific objectives of the study was-

- To determine the character profile of small scale dairy owners.

As in many other parts in Bangladesh, therefore, there is a growing need for information about detail householders and small-scale dairy production parameters to enhance household life styles in the study area. Previous studies in the area as whole country concentrated on evaluating operational productive and reproductive performance of the animals (Miah, 2012; Das *et al.*, 2011; Hall *et al.*, 2012). Similar apply to most other parts of the world (Chenyambuga and Mseleko, 2009; Jeyabalan, 2010). Based on the above background, present research was to determine the role of small scale dairy cattle farming in improving their life styles of producer and to identify the problems of dairy cow raising and suggestions for improvement.

CHAPTER-II

REVIEW OF LITERATURE

2.1 Dayanandan (2011), studied at Ethiopia where Farms owning 1-3, 4-10 and greater than 10 dairy cows were classified as small, medium and large farms, respectively. Only small and medium size farms were considered for data collection. The results indicate that the regression coefficients with respect to concentrate for medium and small size cross breed farms are positive and significant at 10% level. The coefficient of dry fodder for medium size cross breed and local breed are positive and significant at 10% level. The marginal value products (MVPs) and the ratio with price for concentrate were higher for medium size than small size cross breed farms. The MVP for dry fodder, the return is higher in medium size cross breed and local breed farms. Cross breed farms were profitable than local breed farms. Both medium and small categories of cross breed farms were profitable. Among local breed, medium size farms are profitable.

Lwelamira *et al.* (2010), studied in Kayanga ward, Karagwe district in Tanzania with the aim of evaluating contribution of small scale dairy farming in improving household welfare. The specific objective was to compare annual profits from various enterprises including dairy cattle farming by smallholder dairy cattle farmers. Results from the study indicated that small scale dairy farming contributed substantially to household welfare. Average annual profit per household from small scale dairy farming by small scale dairy farmers was approximately 1 million Taka, meaning that it is equally profitable as with other main enterprises by dairy farmers.

Uddin *et al.* (2010) found that, Small-scale farmers of extensive and traditional farming system had a negative entrepreneur's profit (-0.93 and -0.27 US-\$/100 kg ECM, respectively), and were not able to cover their full economic costs from dairying. The high opportunity cost for own factors of production (land, family labor and capital), the differences in economies of scale and institutional support (infrastructure, provision of support services such as artificial insemination and veterinary services) are the key drivers for differences in costs of production in different systems and low profitability.

Hossain *et al.* (2005), conducted the study at 8 thanas in Rangpur district and four months-long survey was diminished on thirty small dairy owners. Major percentage of

farm owner education level that was Higher Secondary level (60%) and the average number of animal per farm was 13.01. The average monthly income of farm owners found in the study area was Taka. 4387. Daily milk yield/cow/farm was 4.27 and 1.78 liters for a crossbred and indigenous dairy cow, respectively. It was estimated that the rearing cost of dairy cow was Taka. 67.5/cow/day and return from rearing dairy cow was Taka. 85.2/cow/day. The net return was Taka. 17.7/cow/day from crossbred in the study area and cost benefit ratio was 1: 1.26. The study showed that there were significant ($P<0.01$) differences within the dry period, service per conception, calving to first service, highest and lowest milk production and lactation period of crossbred and indigenous dairy cows.

Tozer et al. (2003) used a variety of feeding treatments (pasture, pasture + TMR, TMR) to determine a number of income and expense measures. These authors found that, while expenses were lower for the pasture-only scenario (\$2.38 vs. \$4.16 per cow per day – with the PTMR treatment intermediate), confinement feeding of TMR yielded the greatest herd net income over cost (\$55,728 vs. \$58,884 –with the PTMR treatment intermediate). Finally, although the TMR treatment yielded \$2.76 more income per cow per day than the pasture treatment, this advantage shrank to \$0.30 when calculated as income minus costs per day per cow. White et al. (2002), found no statistically significant difference in income over feed costs when comparing pastured cows vs. confined cows.

Urassa and Raphael conducted a socio-economic survey in Morogoro Municipality to study the contribution of the small-scale dairy farming to the welfare of the community. The main focus was on the identification of the production level of milk from dairy cows, amount of income earned by the dairy farmers. A total of 37 smallholder dairy farmers from Morogoro Municipality were selected at random and were interviewed using structured questionnaire. Results from the study show that about two thirds of the respondents had some formal employment and about quarters (24.3) were involved in business. The average milk yield for the respondents ranged between 6-10 liters per cow per day. Average milk production per farmer per day was 22 liters whereas the average daily income earned by the respondents was 3,950/= Taka. The major constraints experienced by the respondents in this study were lack of land and high costs of supplementary feeds as reported by 32.4% and 21.6% respectively.

Rajapurehit (1979) showed that the cost of milk per litter was 0.95 rupee for crossbred cows. The total milk yield per lactation was 2077 for cross breed cows. They also observed that the net returns from crossbreed cows were higher.

Karim and Begum (1988) conducted a study to know the prevalent situation of women's involvement in milch cow rearing in two villages of Comilla district. They found that 42% of the total number of cattle owned by all the households was milch cow of which only 14% was of improved type. Average quantity of milk yield per milch cow was 2.77 litters. The average annual cost of feed, treatment and AI per cows Taka. 3972 of which feed cost constitutes about 98%. The annual gross return per milch cow from milk, cow dung and ploughin was taka. 6674 while the net return was estimated at taka. 2763.

Rahman and Raman (1991) conducted a study on economic analysis of dairy enterprise in four selected villages of Mymensingh district in Bangladesh. The findings showed that feed cost was higher in the urban and milk pocket areas than in the rural and semi-urban areas. In Buffalo area (Ahmen Bari) feed cost is highest. The gross return per animals was positive for all types of cow. Net returns were also positive and higher for the HYV of cows and Buffaloes.

Alam *et al.* (1994) conducted a broad based socio-economic survey in Bangladesh and found that the proportion of cross breed cattle was 11.69%. The returns were higher by 91% for cross breed cows. Return over cash cost per lactation for cross breed cows were 158% higher than local ones.

Rahman (1993) conducted as study at Kalihati and Takerhat areas under Tangail and Madaripur districts to quantify the costs and returns, to explore the interrelationship of factors affecting yield and to examine the rural employment and income generation potentials of dairy enterprise. The gross cost per cow per day was taka. 20.22 at kalihati and taka. 29.34 and 4.91 at takerhat areas.

Rahman and Akteruzzaman (1994) showed that the milk yield per animal per day in small, medium and large herd size were 3.87, 3.37 and 2.38 litters respectively while the cost of production per liter amounted to taka. 8.70, 9.22, and 12.33 respectively. The net

returns per cow per day were taka. 8.07 and taka 4.65 respectively for small and medium herd size and the net loss estimated was taka. 3.14 in case of large herd size.

Ashrafuzzaman (1995) conducted a study to investigate the socio-economic characteristics of indigenous and cross breed dairy cows owners to analyze the relative profitability. The per day total cost of raising a cross breed cow (taka. 35.05) was a little higher over an indigenous cow 6.65 litters for a cross-bred cow which was about double the average milk yield per day of 3.62 litters taka 15.64 and taka. 45.83 for indigenous and cross-bred dairy cow respectively indicating about three times higher net return from a cross bred dairy over indigenous cows.

Kabir (1995) conducted a study to analyze the economic performance of subsidized dairy farming in Tangail districts. The net return per farm was found Taka 14463, taka 21773 and taka 58173 annually for local, cross and cross-bred farm respectively. The investments per taka return were taka. 1.19, taka. 1.27 and taka. 1.37 respectively for local, and cross and cross-bred farms. Overall performance of cross bred dairy cattle was higher than local bred cows.

CHAPTER-III

MATERIALS & METHODS

Methods and procedures that were followed in this study have been described in this chapter.

3.1. Location of the Study:

The study was conducted in Chittagong (Sarkarhat, Mohorihat, Udolia) district. The study was conducted in this area due to fast growing of small scale dairy farming in this locality. Sarkarhat, kathirhat, Udolia were selected as the specific study location.

3.2. Population and Sampling:

On a dairy farm, having maximum 10-12 dairy cows were considered to be the population of the study. A sample of 50 small dairy farmers was randomly selected from the entire population.

3.3 The Research Instrument: In order to collect relevant data for the study, a structured interview schedule was carefully prepared on the basis of the objectives. The questions and statements contained in the interview schedule were simple and direct. The interview schedule contained both open and closed form of questions. Some scales were included in the interview schedule, wherever necessary. The draft interview schedule was prepared in advance before finally using for data collection. The draft interview schedule was pre-tested with 10 farmers from the study area. The pre-test facilitated the researcher to identify faulty items in the draft interview schedule and hence, necessary corrections and modifications were made on the basis of the pre-test results. An English version of the interview schedule has been presented in Appendix-A.

3.4 Data Collection: Data were collected during the period from february, 2018 to march, 2018. The researcher first established appropriate rapport with the respondents and clearly explained the objectives of the study by using local language as far as possible. As a result the respondents furnished proper responses to the questions and statements without any hesitation. Excellent cooperation was received from the respondents and other people of the study area.

3.5. Measurement of some important characteristics of the respondents

Variable names	Description of measurement	Remarks
Age	Number of years at the time of data collection	Range unknown
Educational status	Number of level/class/examination passed/attended by a respondent. A score of zero (0) assigned for not knowing writing or reading, while a score of 0.5 assigned for signing only. For each formal class score was 1.	Possible range: From 0 (illiteracy) to 16
Family size	Number of members live and eat together with common cooking unit.	Range unknown
Farm size	All area under farming by the household members: homestead, own land, land under borga/sharecropping (half benefit calculated), pond, fruit garden etc.	Measured in hectare
Annual income	Total income of all household members in past year (at the time of data collection).	Also referred as annual family income/ annual household income
Training exposure	Days of training received from any agency (GO or NGO) in recent years (five years).	Possible score range unknown
Organizational participation	Number of years involved in different social institutions and organizations.	Possible score range unknown
Extension media contact	Indicate the frequency of his contact with different extension media.	Possible score range 0-33

3.6 Data Processing and Analysis: At the end of data collection, the collected data were coded, compiled, tabulated and analyzed. The local units were converted into standard units. The qualitative data were transferred into quantitative data by appropriate scoring techniques. SPSS software was used for data processing and analyzing.

CHAPTER-IV

RESULTS AND DISCUSSION

4.1. Social Characteristics of the Respondents:

Major farm and household characteristics of the respondents are shown in Table 1. The age of the respondents ranged between 24-57 years. From the study 94.6% of the respondents were male where as only 5.4% were female. In the results show that men have more interest in milk production. Similar observations have been reported in . Educational qualification influences on individuals preferences and behavioral patterns and one's performance, skill-ness and capability.

Table 1: Salient features of the selected characteristics of the respondents.

Variables	Unit	Range (Min-Max)	Mean	Std. Deviation
Age	Years	24-57	43.35	7.06
Education	Grade of schooling	0-16	1.52	0.75
Family size	Number	4-10	6.64	1.41
Total land	Hectare	0.01-0.14	0.06	0.034
Total income	Taka	1,95,000- 11,71,000	7,22,353.33	2,52,555.60
Training exposure	Training course	0-5	2	1.55
Organizational exposure	Organization	0-5	2.93	1.80

In this study educational status of the dairy farmer have been grouped into four categories viz. only sign- 11.11% class I-VIII 33.33%, class IX- XII 33.33% and class XII and above 8.88%. The family size compositions are related to the income of the farmer. Family size also determines the family status and the relationship with the families. In

this study 51.11% families have only 1-6 members. The 37.77% families have 7-8-members & 11.11% families have above 9. 17.77% families have less than 0.05 hectare, 53.33% families have 0.06-0.10 hectare & 28.97% families above 0.10 hectare

4.2. Socio-economic condition of the farmers:

Most of the sampling farmers involved in farming at Chittagong district was used government land by leasing system. Among the farmers, about 37.8% very poor, 48.9% poor and 13.3% small farmers which is categorized in Table 2.

The literacy levels of the farmers have been grouped into four educational groups. There were found 11.11% illiterate (can sign only), 42.2% class I-VIII, 35.6% class IX-XII and 11.11% are above HSC. About 42.2% of the farm householders had higher primary level of education followed by secondary as well higher level of education is 46.71%. Hossain *et al.* (2005), stated that the average literacy rate of farm households in all farm categories was more than 60% which had above primary level of education. Similar observations have also been reported by Mollel *et al.*, (1999). The present study shows that, farming is the main occupation of 80% of the farmers involved in the study and for remaining 20%, it is subsidiary occupation. About 82.2% of the farmer had taken training of farming and left 17.8% did not take any training at all about dairy farming.

Different factors associated with socio-economic condition of dairy farmers of Chittagong districts are listed in **Table 4.2** and specific findings of the study also describe below:

Table 2: Factors associated with socio-economic condition of the farmers. (N=45)

Variables	Categories	No. of respondent	Percentage (%)
Literacy levels of Farmers	Illiterate (Can sign only)	05	11.1%
	Class (I - VIII)	19	42.2%
	Class (IX-XII/HSC)	16	35.6%
	Above HSC	05	11.1%
Farming main occupation	Yes	36	80%
	No	09	20%
Training on farming	1. Care & management of Calf	11 13	24.4% 28.9%
	2. Rearing of Cattle	03	6.7%
	3. Preparation of UMMS	06	13.3%
	4. Vegetable cultivation	04	8.9%
Level of knowledge on farming	High	05	11.11%
	Medium	13	28.89%
	Poor	27	60%
Level of managerial skill on farming	High	08	17.78%
	Medium	22	48.89%
	Poor	15	33.33%
Organizational exposure	1. MILK VITA	40	80%
	2. Dairy association	04	8%
	3. Youth development Organization	02	4%
	4. Women development association	02	4%
	5. BRAC	02	4%

4.3 Income from dairy:

The most important factor for better understanding of socio-economic condition of farmers in study found that the dairy income in category1 (1-30%) is 28.88% in category 2 (31-60%) is 31.33% & category 3 is 40% of their net income. Milk production ranged between 20-90 liters per day with most respondents producing between 30-60 liters per day. The average milk production per day per respondent was 44.35 liters per day/household. However the average milk production per cow per day of 11 ± 2.5

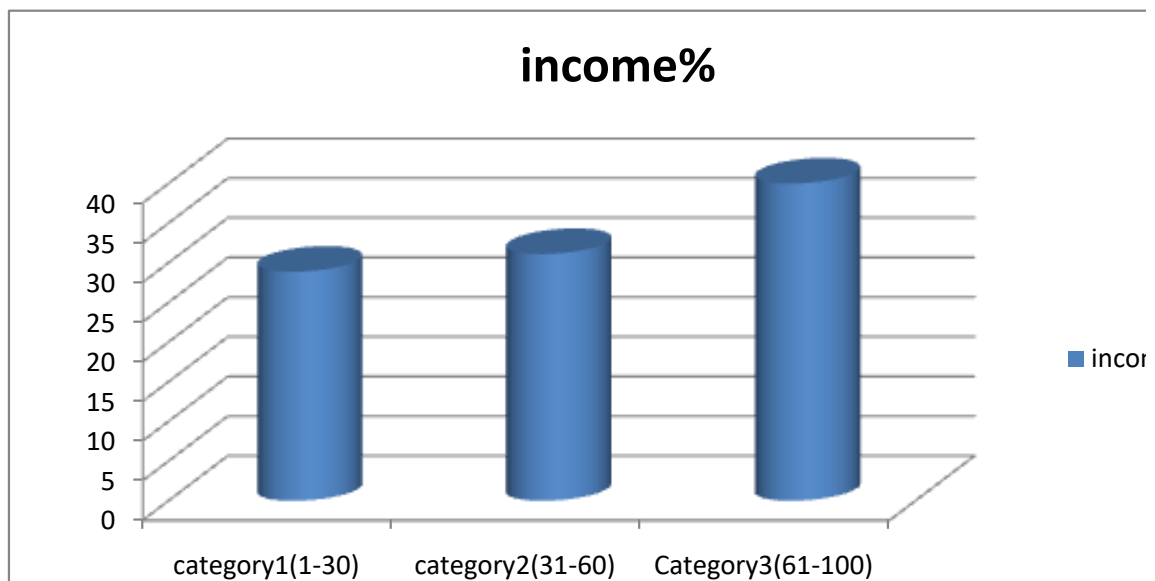


Fig 1: Percentage of Dairy income

4.4 Contribution on household welfare

The study revealed that small-scale dairy farming contributed very much to the Welfare of the household involved in it. Income or profit from the dairy enterprise was mainly used on the following activities, furnishing houses 18.5%, house construction rehabilitation (31%), investing in other income generating activities (24.5%), Education and on other things (such food, health services etc) 26%.

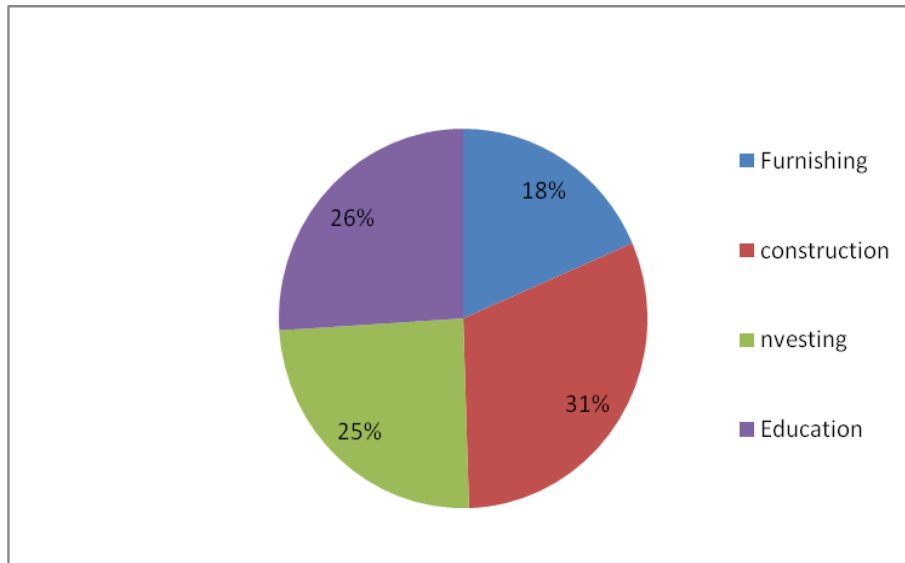


Fig 2: Pie chart showing percentage of contribution of dairy income on family welfare

4.5 Advantages of rearing Dairy cattle in Chittagong area

In Bangladesh Dairy Cattle rearing have a lot of problems, but in this study area there have a great facility to rearing it. For this cause here have a lot of cattle population against the whole over the Bangladesh. These advantages are described in bellow;

4.6 Availability of quality feed and fodder:

Here have a Bathan area for grazing of cattle.

The total pastureland area is 1300 acre for 126000 cattle population. Every society taking lease from government at the rate of 500 taka/acre/year, and there are many hilly area. So have a great chance to cultivate fodder in this area. Assurance of selling milk.

4.7 Veterinary care and services;

In this area every society take free veterinary care and services from UVH. Total 2 doctors maintained all the society of this area. They give free veterinary service and medicine in a regular schedule.

4.8 Artificial insemination facility;

In UVH have a cattle development section, in this section works for improvement cattle variety and AI. There are many members for AI. They do AI in owners farm in regular schedule.

4.9 No transportation cost;

Every farmers transport the milk to the society, and society transport to the milk vita which located at patiya by vechicle and some sell in the local markets . Milk vita give the transportation cost on the basis of quantity of litter of milk.

4.10 Price is distributed on fat content basis;

In Bangladeshi dairy cattle have more Fat percentages, it bear more benefit to farmers. Because of Milk vita gives money on the basis of fat content. And the value of milk in local market is also high.

4.11 Vaccination and Anthelmentic Programe;

All are maintained by UVH, it gives much benefit to farmers because government gives deep eye in livestock section.

4.12 Problems Related to Rearing Dairy Cows:

The purposes of this section of the study was to identify the problems of raising dairy cows in the selected areas of Chittagong districts and to make suggestion with a view to solving these problems for expanding rearing of dairy cow owners as a tools of poverty alleviation under subsistence and semi-commercial farming system. The problems are as follows-

4.13 High prices of feed: This is the most important problem of rearing dairy cows. About 100 percent farm owners complained about this problem

4.14 Low prices of milk: The prices of milk in the study areas were low. The average price of milk per litter in the study areas was estimated at taka 40-50, which was lower than the prices prevailed in many other areas of Bangladesh. The problem of low prices milk was reported by the 100 percent of farm owners.

4.15 Inadequate veterinary care and service: there are only two veterinarians in the UVH but it is not in sufficient number, must be need more number of doctors.

4.16 Insufficient field worker: AI is one of the most important methods used for the improvement of breeds. But field worker is insufficient for AI. Must be increase the no. of AI worker.

4.17 Lack of credit: It is one of the important constraints for improvement of dairy enterprises. About 70 percent farm owners could not developed their dairy farm due to the lack of credit.

4.18 Lack of technology: This is also an important point for development of dairy farming. If proper technological knowledge spread among farmer the farming system will developed rapidly. All farmers cannot get this technology.

CHAPTER-V

CONCLUSION

Rural and urban poor people can play a significant role in the agricultural sector by emphasizing dairy subsector in Bangladesh. Development initiatives over the last few decades clearly showed that sustained improvements in productivity and in people's lives depend upon the recognition of the crucial role played by the poor farmers in production, processing and marketing in the small-scale entrepreneurial sector in the country. In addition, this finally it can be concluded that Small holder dairy production was found to be an important and have the potential to poverty alleviation, food security, improved family nutrition and income and employment generation. However, disease, high price of concentrate feed, and failure of AI, insufficient doctor, insufficient field worker for AI, were main constraints limiting small-scale dairy production in the study area. Through elimination of the problems and supply all kinds of facilities, dairy farming can play important role in the development of our economy.

CHAPTER- VI

REFERENCES

- Akhter, S., Haque, K.S., Jalil, M.A. and Miah, G., 2002. Characterization , Selection and Conservation of Red Chittagong Cattle, Annual Research Review Workshop on 25 to 26th June, held in Bangladesh Livestock Research Institute, Savar, Dhaka.
- Alam, J., Akteruzzaman, M., Rahman, A. and Ahmed, Z., 1994. Comparative performance of local and cross-bred cows in Bangladesh. *Indian J. Dairy Science*. 47 (2): 112-117.
- Amin, M.M., 1994. Prospects of commercial production of veterinary vaccines in private sector. Proceedings of BSVER Symposium, July 28, Dhaka, Bangladesh.
- Ashraf, A., 1998. A study on some economic traits of indigenous and graded cattle in. Khulna region. MS Thesis. Department of Animal Breeding and Genetics. Bangladesh Agricultural University, Mymensingh.
- Bangladesh Economic Review., 2006. Quarterly update of economic views. Ministry of Finance, Government of the people Republic of Bangladesh.
- BBS., 2004. Bangladesh Bureau of Statistics, Planning Division, Ministry of Planning. Government of the People's Republic of Bangladesh.
- BBS., 2006. Bangladesh Bureau of Statistics, Planning Division, Ministry of Planning. Government of the People's Republic of Bangladesh.
- DLS., 2000. Annual report on livestock, Division of Livestock Statistics, Ministry of Fisheries And Livestock, Farmgate, Dhaka, Bangladesh.
- DLS., 2002. Annual report on livestock, Division of Livestock Statistics, Ministry of Fisheries And Livestock, Farmgate, Dhaka, Bangladesh.

- DLS., 2008. Annual report on livestock, Division of Livestock Statistics, Ministry of Fisheries And Livestock, Farmgate, Dhaka, Bangladesh.
- Efferson, J.N., 1963. Principles of Farm management, MCGraw-Hill Book Company, Inc. New York.
- FAO., 2004a. Production Year Book Rome, Italy.
- Hemme, T., 2008. IFCN Dairy Report. International Farm Comparison Network. IFCN Dairy Research Center. Kiel Germany.
- Hemme. T, Garcia, O. and Khan, A. R., 2004. A Review of Milk Production in Bangladesh with particular Emphasis on small-scale producers. FAO-Pro Poor Livestock Policy Initiatives working paper No.7
- Hossain, M. M., Alam, M. M., Rashid, M. M. Assaduzzaman, M. and Rahman, M. M., 2005. Small Scale Dairy Farming Practice in a selective Area of Bangladesh. Pakistan Journal of Nutrition 4(4): 215-221
- Islam, S.M.M., 1986. Economics of dairy cows under milk-shed area of District. M. Sc. Thesis, Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh, Bangladesh.
- J Lwelamira, H K Binamungu* and F B Njau (2010). Contribution of small scale dairy farming under zero-grazing in improving household welfare in Kayanga ward, Karagwe District, Tanzania. Livestock research for rural development, 2010.
- Kabir, M.A., 1995. An economic study of subsidized private dairy farming in selected area of Bangladesh M.Sc. Thesis Department of Agricultural Economic, Bangladesh Agricultural University, Mymensingh. Bangladesh, pp: 129-134
- Karim, Z., 1997. Agriculture for 21st century in Bangladesh. In: A final draft policy Livestock, Dhaka, Bangladesh.

- Khan, A. R., 2007. Profitability, efficiency and market performance of dairy farms in Bangladesh. A PhD thesis. Department of Agricultural Economics. Bangladesh Agricultural University, Mymensingh-2202, Bangladesh.
- Rahman, M.F., Islam, M.S., Hossain, M.A., Prodhan, M.A.M. and Rahman, A., 1993. Reproductive patterns of different breeds of cows in Bangladesh. Bangladesh Journal of Livestock Research. Vol-1, No-1, pp: 19-24, Bangladesh Livestock Research Institute.
- Rajapurohit, A. R., 1979. "Crossbreeding of Indian Cattle : An Evaluation", Economic and Political Weekly, Vol. 14 (12-13): A9-A24.
- Saadullah, M. 2001. Smallholder dairy production and marketing in Bangladesh. In: Smallholder Saadullah, M. 2001. Smallholder dairy production and marketing in Bangladesh In: Smallholder dairy production and marketing-opportunities and constraints; Proceedings of a South-South workshop held at National Dairy Development Board (NDDB) Anand, India, 13-16 March 2001.
- Shamsuddin, M., Goodger, W. J., Hossein, M. S., Azizunnesa, Bennett, T. and Nordlund, T., 2006. A survey to identify economic opportunities for smallholder dairy farms in Bangladesh. Tropical Animal Health and Production 38:131 -140.
- Tozer, P.R. and R.G. Huffaker, 1999. Dairy deregulation and low-input dairy production: A bioeconomic analysis. Journal of Agricultural and Resource Economics, 24(1): 155-172.
- Uddin, M. M., Van Huylenbroeck G, Hagedorn, K, Sultana M. N. and Peters K. J. 2010. Institutional and organizational issues in livestock service delivery in Bangladesh. Quarterly Journal of International Agriculture 49 (2): 111-125.