Farming Practices and Local Resource Circulation System of Dairy Farms

-A Case Study of Maulavibazar District of Bangladesh-

Junayed Uddin AHMED[1*] and Tsuneo KOBAYASHI[2]
The United Graduate School of Agricultural Sciences, Kagoshima University[1]
Faculty of Agriculture, Saga University[2]
[*]Email: junayeda@yahoo.com

Abstract: This article tries to explore the situation of dairying in Maulavibazar District of Bangladesh. The study has shown that dairying in Maulavibazar district is traditional and labor intensive. The data reveal a greater use of family labor in dairy cows' care and delivering milk. Income from the dairy activities was used to meet/provide household expenses, savings, investment and insurance. Finding of the study reveals that Local Resource Circulation System (LRCSs) by means of farm management to decrease the cost, and increase the income and labor utilization in dairy-crop farming in the farm level. It has contributed to provide year-round working opportunities for the local people, utilize family labor effectively and provide a place for milk market low shipping and no storage cost. Integrated agriculture as the primary activity among most of the people has good chance to develop dairying as reducing stress and shock of farming household. The empirical basis of the study is a survey among farmers of Maulavibazar district at random selection.

[Junayed Uddin AHMED and Tsuneo KOBAYASHI. **Farming Practices and Local Resource Circulation System of Dairy Farms.** *Life Sci J* 2013; 10(4): 1615-1619]. (ISSN: 1097-8135). http://www.lifesciencesite.com 213

Keywords: Local Resource Circulation System (LRCSs); Integrated Farming; Vulnerability; Maulavibazar

1. Background and objectives

The majority of the dairy cattle in Bangladesh are in the hands of smallholder dairy producers. Dairy production is also a part of mixed farming systems in Bangladesh (Saadullah, 2001). Eighty percent of the country's people live in rural areas and are highly depend on an agricultural system that is finely tuned to a tropical monsoon climate (UNDP, 2005). Approximately 2.0% of the country's GDP comes from the livestock and poultry sector. Approximately 42% of agricultural households are engaged in dairy farming (BBS, 2008). Dairy production is also considered a valuable tool for use in developing village microeconomics in Bangladesh to improve rural living conditions and alleviate rural poverty (Shamsuddin et al., 2007). Some 750–900 million people (or 12–14% of the world's population) in approximately 150 million farm households across the world are involved in milk production. In Bangladesh, approximately 7 million people operate 1.4 million family dairy farms, working very small plots of land. Cows can provide farmers with regular cash flow from milk sales, nutritional milk for home consumption, manure for cooking fuel and fertilizer.

The dependency of rural people on livestock for their livelihood is quite substantial, and this situation is likely to continue for years to come. Among the types of livestock kept, dairy cattle play a pivotal role in the livelihoods farmers' in Bangladesh.

Milk and its products are rich sources of readily available calcium, riboflavin and vitamin A. (M.A. Samad and M.H Rashid, 2002). According to the national health strategy, people in Bangladesh should have 250 ml of milk every day. However, the average daily consumption per person was less than 41.2 g in 2002 (Miah and Mandal, 2002) and was 44.3 g in 2007 (FAO). Malnutrition has been a persistent problem for the poverty-stricken developing country like Bangladesh. The World Bank estimates that Bangladesh is ranked first in the world in the number of children suffering from malnutrition. In Bangladesh, 26% of the population is malnourished.

This study was conducted to examine dairy farming practices, resource circulation systems and the contribution of dairy farms to farmers' perception about vulnerability reduction due to dairy farming.

2. Methodology

A socio-economic survey was conducted in the Maulavibazar District to accomplish the objective of the study. The survey addressed determination of the level of production of milk from dairy cows, the amount of income earned by dairy farmers, items on which income from dairy farming is spent, etc. About 36% of agricultural households engaged in dairy farming in this district. It consists of Seven Upazilas, Five Pourasavas (Municipality) and Sixty seven Unions. Sreemongol is one of the Upazila of Maulavibazar district which consists of one municipality (paurashava), 12 union parishads, 124 mouzas and 206 villages. 'R' and 'S' are two areas that are developed dairy farming remarkably among other areas of Sreemongol Upazila. There are 38

dairy farms in these areas recorded in Upazila Animal Husbandry office. We have tried to cover all these farms but some farmers didn't want to participate in the survey. Finally, we have found 25 farms to interview. Data were collected from December 2011 to January 2012, according to a survey form designed to accomplish the study objectives. The key survey items included the followings: the owner's general information, the cattle population, the feed and feeding system used, the overall management system, flow of income, labor and material etc. Data were collected through direct interviews and personal visits to the farms. Before the interview began, each respondent was given a brief description of the nature and purpose of the study. The respondents were selected randomly. The responses of farmers were recorded directly on the interview forms.

3. Results and discussions

3.1 Socio-economic characteristics of dairy farms

The major farms' and households' characteristics of the respondents are shown in Table 1. The respondents ranged in modal age between 41 to 50 years. The survey results indicated that most of the respondents (64%) were less than or equal to 50 years old whereas 80% were male. The level of education had no significant effect on the level of milk production of the dairy cattle. The educational level of the respondents ranged from primary school education to university education. More than 40% (48%) of the respondents had received a secondary or higher education. The results of the survey also show that dairy production constitutes the major source of income of the households.

Table 1: Socio-economic characteristics of respondents

Particulars		Maulavibazar
Owner's occupation	Agriculture	14 (56.0)
	Business and others	11 (44.0)
Income source (Dairy Farm)	Main	14 (56.0)
	Side	11 (44.0)
Education	Up to class 5	6 (24.0)
	Class 6 to S.S.C	7 (28.0)
	H.S.C	3 (12.0)
	Above H.S.C	9 (36.0)
Age	21-40	6 (24.0)
	41-50	10 (40.0)
	More than 50	9 (36.0)
Gender	Man	20 (80.0)
	Woman	5 (20.0)
Cattle owned by dairy farms	1-6 cows	8 (32.0)
	6-25 cows	9 (36.0)
	26 or more cows	8 (32.0)

Source: Survey Data 2011

* Parentheses indicate percentage

3.2 Management practices of dairy farms

3.2.1 Number of cows per farm

About 99% of the cows are crossbreed in the study area and 45% cows are milking cows. Averages are 19 cows per households which range from 3 to 60 cows in one household.

3.2.2 Dairy cattle feeding

The survey results show that 8% of respondents take their cows to the outside of the stall for feeding, and 92% of the respondents fed their cows inside the stall as shown in Table 2. Farmers primarily prefer the zero grazing concepts because it reduces the risk of disease, especially foot and mouth disease (FMD), which can results in very strict isolation. The survey results also show that all of the respondents supplemented their cattle's feed.

Table 2: Feeding of dairy cattle by farmers

Particulars	Fq.	%
Feeding System		
Partial grazing	2	8.0
Zero grazing	23	92.0
Supplementary feeding		
Green grass & other feeds	24	96.0
Only other feeds	1	4.0

Source: Survey Data 2011

3.2.3 Milking system

All of the farmers in this area milk their cows by hand. Most of the farmers use hygienic procedures for milking their cows, i.e., washing the udders before milking and cleaning their buckets and hands regularly. Milking of cows is performed primarily by hired people who have experienced in milking.

3.2.4 Cow barn systems

Most of the dairy farmers in this district feed their cows in stalls in which the cows are tied by the neck (92% of respondents). Some of the dairy farmers (8% of respondents) let their cows out of their stalls, e.g., onto a common-land river bank, to feed. Most of the cow stalls consist of concrete floors with half walls and tin roofs (96% of respondents) and only respondents have mud floor and tin walls and tin roofs.

3.2.5 Labor use

Most of the labor force of dairy farms consists of family members (63%). Women (20%) are very enthusiastic about taking care of cows in the stalls. However, employees (37%) are hired to take care of cows and perform other work related to dairy production.

3.2.6 Water supply

Water is important for dairy cows for drinking, washing out stalls, and spraying cows to keep them cool in the summer season. Approximately 64% of the respondents surveyed use underground

water from boreholes and others use tube-well (36%) water, although it is very difficult to obtain water from this source. Others use supply water in dairy farming activities.

3.2.7 Disposal of manure

None of the farmers prepared compost sheds for managing cow manure properly. However, most of the farmers (92%) put manure to holes alongside their farms or short distances from farm. After a few days, they use the manure in rice fields, and some of the manure is sold to other farmers especially to tea garden farmers or fruits farmers.

3.3 Economic aspect of dairying

3.3.1 Costs and income of rearing milking cows

Rearing dairy cows has increasingly been viewed as a mean of alleviating poverty and is believed to improve the living conditions of landless and small households (Saadullah, 2002). According to Saadullah (2002), many smallholders in developing countries, particularly in mixed farming systems, prefer the flow products (milk, draft power and manure) rather than the end products (meat, hides and skins) to keep livestock because slaughtering their animals results in the permanent loss of flow products. The respondents thought that the income from milk is main income, that's why Table 3 summarizes the costs of and income from rearing one dairy milking cow per day. The costs shown in this table do not include the cost of purchasing cows because nearly all of the farmers surveyed obtained their cows as a family inheritance and also excludes the family labor cost in calculations. Farmers are asked the cost in one month in every item except the housing and tolls and equipments costs are in annually. Then, the authors have calculated in per day basis as 1 year equals to 365 days and 1 month equals to 30 days. The results show that the costs of rearing dairy cows are Tk.117.30 and net income after operating costs are Tk. 434.70. Income from milk can be used to meet farm household daily expenses and provide savings, investment and insurance.

Table 3: Costs and income of rearing one milking cow per day

Items	Quantity (Kg)	Amount
Feed Cost		
Paddy straw	10.0	15.00
Green grass	12.0	18.00
Concentrates	4.5	45.00
Labor costs -		18.00
Housing costs -		4.50
Veterinary costs -		8.10
A.I. costs -		2.20
Transport -		2.50
Tools and equipment		4.00
Total cost		**117.30**
Sales of milk	**12.0**	**552.00**
Income from milk		**434.70**

Source: Survey Data of 2011

3.3.2 Milk production and consumption and income generation

Milk production ranges from 8 to 352 liters per day and average milk production per day is 122 liters in Moulavibazar. The gross daily income from milk sales ranged from Tk. 336 to Tk. 15840 in Moulavibazar per day. The average daily incomes from milk production for the respondents are 5526 Tk. in Moulavibazar (Table 4). Per capita daily milk consumption is 188 ml in Moulavibazar District. The milk consumption of dairy farmers in this district is higher than that in Bangladesh as a whole (the national average per capita daily milk consumption is 44.3 ml) as in Table 5.

Table 4: Milk Production and Gross Income for Dairy Farmers

	Moulavibazar	
kg	**Fq**	**GI (Tk)**
0	- (-)	NA
1-5	1 (4)	NA
6-10	10 (40)	NA
11-20	12 (48)	NA
Above 20	2 (8)	NA
kg	**Fq**	**GI (Tk)**
1-10	1 (4)	336
11-50	11 (44)	506-2300
51-100	3 (12)	2346-4600
Above 100	10 (40)	Above 4600
Average	**122 liters**	**5526**

Source: Survey data 2011

* Parentheses indicate percentage

Table 5: Milk Consumption of Dairy Farmers

Milk Consumption (ml/day)	**Bangladesh**	**Moulavibazar**
Average household size	4.8 persons	6.2 persons
Per capita milk consumption	44.3 ml	188 ml

Source: Survey data 2011

3.4 Contribution of dairy farming to farmers' livelihoods

The study revealed that dairy farming contributed considerably to the livelihood of dairy farmers in the studied district in Bangladesh. Dairy production provides continuous income to these farmers and prevents starvation even during times of shock and stress. Out of the farmers interviewed, approximately 96% of people in Maulavibazar indicated that dairy farming reduces their vulnerability as it provides regular income that can be used to meeting household expenditures (Table 6). About 92% of farmers expressed that dairy farming provided them with sustainable livelihoods. The farmers interviewed also reported that women members used income from milk to pay children's school fees, purchase school uniforms and books, and

meet petty expenses without having to depend on husbands or elders. Dairy farming also enhances the status of women, self-respect and dignity of farming family members. Dairy farming contributes reductions in the levels of infant mortality, labor migration, school dropouts, and malnutrition. Dairy farming made it possible for the respondents to purchase household assets such as utensils, gas stoves, fans, TVs, bicycles, etc. Their participation in village activities has increased, also increased their association with government agencies, banks and other organizations. This data can't be expressed in quantitative value but it is revealed through qualitative descriptions of the respondents. In light of these benefits, it is evident that the income from dairy farming has contributed to improving the living conditions of farmers in the study area.

Table 6: Farmer's perceptions of their vulnerability reduction due to dairy farming

Parameter	Moulavibazar	
	Yes	No
Dairy cattle rearing reduces vulnerability	24 (96.0)	1 (4.0)
Dairy farming provides a sustainable livelihood	23 (92.0)	2 (8.0)
Dairy farming family faces stresses and shocks	2 (8.0)	23 (92.0)
Integrated farming provides a sustainable livelihood	22 (88.0)	3 (12.0)

Source: Survey data 2011

* Parentheses indicate percentage

3.5 Role of Local Resource Circulation System (LRCS) in Dairy Farming

LRCS has good linkages with local raw materials, labor, milk marketing etc. It is mainly both way circulation systems. First, it circulates the resources by means of farm management to decrease the cost of milk production and increase the income and labor utilization in integrated dairy farming in the farm-level. Second, it circulates the resources such as local raw milk as local nutritional intake, local labor, and local capital by means of relating to industries in local economy-level. This system is to promote the local economic development through proper utilization of local resources (animal feed, cow-dung, and other farm residues, family or local labor, local land and capital, local nutritional intake). It provides employment opportunities for local people in farm households as well as self processing shop such as sweets shop and self selling outlet directed by farmers. Figure 1 illustrates the mechanism of LRCS of dairy in the study area. In this system, farmers get the animal feed from the crop lands that they simultaneously operate with cattle farming. During post harvesting time, farmers collect and store crop residuals (rice straw and other crop residuals) for timely and year round feed supply. The cow-dung and other droppings of dairy cattle used to produce compost fertilizer for crop cultivation instead of chemical fertilizer. Compost fertilizer leads to high yield crop production (Bangladesh Agricultural Research Institute, 2011). The survey results revealed that per capita milk consumption is 188 ml which is higher than that of Bangladesh (44.3 ml in 2007, FAO). All the functions related to the farm economy handled by family labor particularly female member of households.

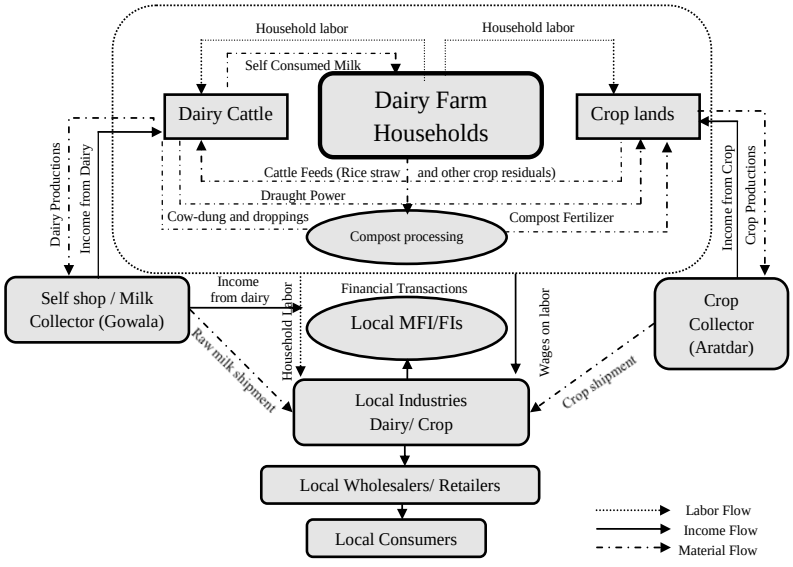

Figure 1: Local Resource Circulation System of Dairy Farming

Source: Own illustration from Survey Data of 2011 based on Prasanna, 2012

Note: Local processing industries in the study area produce sweets, yogurt, curt etc. Farmers sell their milk to Gowala or self shop owner who paid money weekly and deposited in the commercial bank/ Financial Institutions (FIs) and farmers paid loan instalment to Micro Finance Institutions (MFIs) and FIs

4. Conclusion

Dairy farming involves a very stable composition of cows at the household level and offers good prospects for improving farming families' living conditions. Integrated dairy farming and agriculture in this district increase the short-term benefits and long-term sustainability of agriculture, especially dairy farming. Dairy farming in this district is labor-intensive especially family labor. The survey results revealed the rationality of developing domestic dairy sector through circulation of LRCSs. Milk consumption by members of dairy farming households is considerably higher than the country's average per capita milk consumption. However, the income from dairy farming contributes to meeting various types of household expenses, such as children's educational expenses, purchase of household appliances and assets, etc. Engaging in integrated farming with dairy farming increases the sustainability of rural livelihoods by reducing malnutrition of children, increasing interaction with the government and banks, increasing participation in village activities, empowering women, etc. In these and other ways, dairy farming contributes to the betterment of poor farmers' livelihoods.

References

[1] Saadullah M. (2001). Smallholder dairy production and marketing in Bangladesh. In: Rangnekar D. and Thorpe W. (eds), Smallholder dairy production and marketing-Opportunities and constraints. Proceedings of a South-Asian workshop held at NDDB, Anand, India, 13-16 March 2001. NDDB (National Dairy Development Board), Anand, India, and ILRI (International Livestock Research Institute), Nairobi, Kenya.

[2] Shamsuddin M, Alam MM, Hossein MS, Goodger WJ, Bari FY, Ahmed TU, Hossain MM, Khan AHMSI (2007). Participatory rural appraisal to identify needs and prospects of market-oriented dairy industries in Bangladesh. Tropical Animal Health and Production 39:567-581.

[3] DLS (2008). Annual report on livestock, Division of Livestock Statistics, Ministry of Fisheries and Livestock, Farmgate, Dhaka, Bangladesh.

[4] Siddiquee, N.A. & Southwood, R. (2011). 'Strengthening the dairy Value Chain in Bangladesh'. Slideshow presented at the Gender and Market Oriented Agriculture (AgriGender 2011) Workshop, Addis Ababa, Ethiopia, 31 January–2 February.

[5] Bangladesh Bureau of Statistics (2008), Statistical Year Book of Bangladesh, Ministry of Planning.

[6] Human Development Reports, UNDP, (2005).

[7] Alexandru Nedelea,Veronica Grosu & Mohammad Shamsuddoha (2009,. 'Dairy Farming- an Alternative Income Generating Activity'. Bulletin UASVM Horticulture, 66(2)/ 2009.

[8] M.A.Samad AND M.H. Rashid, (2002), 'Promotion of Smallholder Dairy Production in Bangladesh'. Proceedings of the Workshop on Alleviating Micronutrient Malnutrition through Agriculture in Bangladesh.

[9] RPIR Prasanna and Y. Shiratake (2012), 'An assessment of Resources Dual Circulations of Dairy Sector in the Local Areas of Srilanka-A Case Study of the Dairy Sector in Kurunegala District-'. Japanese Journal of Food, Agricultural and Resource Economics, Vol. 63, No. 2.

[10] M.M Hoque and Y. Shiratake (2013), 'Impact of the private Processors' Competitions on the Dairy Cooperative in Bangladesh- A study on the dairy cooperative Milk Vita and its members in Srinagar in the Munshigonj District-'. Life Science Journal, 10(2).

11/6/2013