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Economic Analysis of Rural Dairy Farms in Kamrup District of Assam

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ABSTRACT

The present study is an attempt to study the economics of milk production among rural dairy farmers in Kamrup district of Assam. Kamrup district was selected purposively because the average milk production was quiet high in the district. The study was done by selecting 240 dairy farmers consisting of 104 dairy farmers from small, 112 medium and 24 large categories were selected from two blocks viz., Dimoria and Chandrapur block of Kamrup district. The sample selection was done through multistage random sampling technique. The total milk production in 240 sample dairy farms was reported as 20043 litres per day with an average milk production of 11.59 per day per milch animal. Overall, the average milk production in 240 sample households was estimated to be 83.52 litres per farm per day. The total variable cost per farm per month was Rs. 86307.35, Rs. 51364.64, Rs. 100819.06 and Rs. 169420.83 for overall, small, medium and large category of dairy farms, respectively. Feed and fodder cost was accounted for 72.05 per cent out of the total variable cost. The total fixed cost per farm per annum accounted was Rs. 9353.12, Rs. 5705.15, Rs. 10917.03 and Rs. 17862.65. for overall, small, medium and large category of dairy farms, respectively. The overall profit per farm per year was estimated as Rs. 578765.28. The profit per farm per year increased from Rs. 351203.28 from small farms to Rs. 686974.32 in medium farms to Rs. 1066896.24 in large dairy farms respectively.

Keywords: Economic Analysis, Rural Areas, Dairy Farms, Kamrup District, Assam

INTRODUCTION

India is predominantly an agricultural country and livestock has been an integral component of India's agriculture and rural economy. India with only 2.4 per cent of world's total land area supports about 18 per cent of human and 15 per cent of livestock population in the world (Mehra et. al. 2018). Dairying in India occupies a prominent place in rural life and provides not only subsidiary occupation and nutritional standards but is also a source of organic manures and draught power. Milk is an important commodity not only as a source of dairy industrial raw material but also a nutritive food for the people (Kumawat et al. 2014). The unique characteristic of Indian dairy industry is that the bulk of milk production in the country is handled by small milk producers

who are illiterate and ignorant of economic aspects of milk production. Dairying is important for India because it is a rural based, land saving industry. Dairying is a secure path and future of our rural development and became a commercial enterprise (Gangasagare, and Karanjka, 2009).

Though agriculture is considered as the mainstay of the economy of Assam and agriculture and allied activities in Assam do continue to be the dominant sources of livelihood for majority of its people, it is also a fact that agriculture in the State is characterized by low level of productivity due to recurring natural calamities, low level of mechanization, inadequate availability of quality inputs, poor soil health, low level of assured irrigation and inadequate marketing infrastructure. This necessitates the importance of allied sectors like dairy in States economy (Kakaty and Das, 2017). According to Kumar et. al. (2010) majority of the informal milk market agents in the state of Assam are small traders and derive substantial portion of their household income from it. The scale of their business continues to be low, though the returns from the milk marketing seem to be comparable with or higher than the prevailing wages for an unskilled worker. Thus, milk marketing (fresh or processed) provides more lucrative returns. Majority of the milk marketing agents established their business themselves. The net returns from milk processing and value-addition were significantly higher than fresh milk marketing.

Several researchers in the various parts of the country have been studied the input-output relationship in milk production and found different for different areas depending upon the type of milch animals and the milk production technology in this context, the present study is an attempt to study the economics of dairy cattle farms in Kamrup district of Assam.

METHODOLOGY

Multistage random sampling technique was adopted to select the sample required for study. Kamrup district was purposively selected for the study, as major milk producing district of Assam. In the second and third stage of sampling two blocks and ten rural areas from both the blocks were randomly selected. In the fourth stage of sampling a list of all the dairy farm households from all the ten rural areas were prepared and farmers were categorized in to three categories, viz. small farms (Upto 10 Cows), medium farms (11 to 20 Cows) and large farms (21 and above Cows). Thus a total of 240 sample households were selected for the study. To achieve the specific objectives of this study, necessary data were collected from dairy farmers through personal interviews by using schedules. The schedules were constructed after following an extensive review of literature, discussion with experts and pilot survey. Information was sought on the milk production practices adopted by the milk farmers in the study area and the average price farmers received for the milk. Secondary data was collected from various websites and report of various committees etc. Both tabular and functional analyses with econometrical tools were utilized for the analysis of the data and logical interpretation of the different aspects and results of the study. The interest on the fixed capital was worked out based on prevailing rate of interest i.e. 4 percent per annum (Reserve Bank of India, 2020). Depreciation on fixed asset was calculated separately for milch animals, cattle shed, machinery and equipment (Ghule et. al., 2012) as Crossbred cows- 8 per cent (productive life 12.5 years).

Depreciation rates for building was worked out as 5 percent, Equipment as 20 percent.

RESULTS AND DISCUSSION

Distribution of Sample Dairy Farms: Table 1 presents the distribution of sample dairy farms. As mentioned earlier, data were collected from 240 sample dairy farms each from Dimoria and Chandrapur block. The sample dairy farms were grouped into three categories viz. small (Upto 10 Cows), medium (11 to 20 Cows) and large (21 and above Cows). From the table it found that 104 (43.33%) dairy farmers belongs to small category, 112 (46.67%) dairy farmers were identified to be in medium category and 24 (10.00%) dairy farmers were in large category. Here it is to be mentioned that the dairy farmers are involved in the dairy farming business since long. Infact most the dairy farmers under large category were second or third generation dairy farmers and all the selected sample dairy farmers were doing dairy farming bussiness for commercial purpose (similar selection of commercial dairy farms for study purpose was done by (Ghule et. al. 2012).

Table 1: Distribution of Sample Dairy Farms

Category of Dairy Farmers	Frequency	Valid Percent
Small (Upto 10 Cows)	104	43.33
Medium (11 to 20 Cows)	112	46.67
Large (21 and above Cows)	24	10.00
Total	240	100.00

Distribution of Cattle

Table 2 presents the distribution of cattle in sample dairy farms as overall of 3555 cattle were observed in 240 sample dairy farms with 1729 milch cow, 112 dry cow, 464 heifer, 32 bull and 1218 calves. There were 459 milch cows, 143 dry cows, 23 heifers, 4 bulls and 281 calves by small category of dairy farms. Medium category of dairy farms reported 955 milch cows, 51 dry cows, 215 heifers, 19 bulls and 689 calves. Large category of dairy farms reported 315 milch cows, 38 dry cows, 105 heifers, 9 bulls and 248 calves. A total of 910 animals from small, 1930 animals from medium and 715 animals from large category of dairy farms were found.

Table 2: Distribution of Cattle in Sample Dairy Farms across various size groups

Sl No	Cattle	Category of Farms			
		Small	Medium	Large	Overall
1	Milch Cow	459(50.44)	955(49.48)	315(44.06)	**1729(48.64)**
2	Dry Cow	143(15.71)	51(2.64)	38(5.31)	**112(3.15)**
3	Heifer	23(2.53)	215(11.14)	105(14.69)	**464(13.05)**
4	Bull	4(0.44)	19(0.98)	9(1.26)	**32(0.90)**
5	Calf	281(30.88)	689(35.70)	248(34.69)	**1218(34.26)**
	Total	**910(100)**	**1930(100)**	**715(100)**	**3555(100)**

The figures in parentheses indicate percentages to total

Milk Production by Dairy Farms

Table 3 presents that the overall milk production by 240 dairy farms were found to be 20043 liters per day, out of which 5203 liters per day was produced by 104 small farms, 11150 liters per day by 112 medium farms and 3690 liters per day by 24 large farms. However, overall average milk production of 83.51 liters per day per farm where, 50.03 liters per day per farm produced by small farms, 99.55 liters per day per farm produced by medium and 153.75 liters per day per farm produced by large farms. Overall, the average milk production per day per milch animal in 240 sample farms was estimated to be 11.59 liters. On the other hand, the average milk production per day per milch animal in small dairy farms was observed to be 11.34 liters, in medium dairy farms as 11.68 liters and in large dairy farms as 11.71 liters.

Table 3: Milk Production by Dairy Farms across various size groups

Sl No	Category of Farms	Particulars			
		No. of Dairy Farms	Total Milk Production/Day	Average Milk Production/Day/Farm	Average Milk Yield/Day/Milch Animal
1	Small	104	5203	50.03	11.34
2	Medium	112	11150	99.55	11.68
3	Large	24	3690	153.75	11.71
	Overall	**240**	**20043**	**83.51**	**11.59**

Economic Analysis of Milk Production

The economic analysis of milk production usually includes cost of production, returns, and profitability of small, medium, and large dairy farms.

Cost Involved in Milk Production

Variable Cost

The cost involved for purchasing various inputs in milk production is presented in Table 4. The different inputs of dairy farming were dry fodder cost, labour charges and veterinary medicines etc. On an average the total variable cost incurred per farm per annum among small, medium and large dairy farms was found to be Rs. 87935.52, Rs 51371.85, Rs. 100819.06 and Rs. 169420.83 respectively in dairy farming. The expenditure on feed accounted for the majority of the share of variable cost per farm per month with Rs. 34500.1 in small, Rs. 73977.27 in medium and Rs. 127102.5 in large categories of dairy farms.

Table 4: Variable costs among different categories of Dairy Farms (Rupees per farm per month)

Sl No	Frequency	Category of Farms			
		Small	**Medium**	**Large**	**Overall**
Variable Cost					
1	Fodder Cost	34500.1	73977.27	127102.5	**62183.02**
		(67.17)	(73.38)	(75.02)	**(72.05)**
2	Labour Cost	14461.54	22258.93	34333.33	**20145.83**
		(28.15)	(22.08)	(20.27)	**(23.34)**
3	Veterinary & Medicine	1050	2082.86	3625	**1789.5**
		(2.04)	(2.07)	(2.14)	**(2.07)**
4	Miscellaneous Cost	1353	2500	4360	**2189**
		(2.63)	(2.48)	(2.57)	**(2.54)**
	Total Variable Cost	**51364.64**	**100819.06**	**169420.83**	**86307.35**
		(100)	**(100)**	**(100)**	**(100)**

The figures in parentheses indicate percentages to total

Fixed Cost

The fixed cost of dairy farm is depreciation on animals, cattle shed and equipment (Table 5). The overall cost of depreciation on animals, cattle shed and equipment were Rs. 5575.17 Rs. 357.59 and Rs. 288.92. However, in case of small dairy farms the depreciation cost of animals, cattle shed and equipment were Rs. 3393.72, Rs. 219.75 and Rs. 182.52, respectively, while medium dairy farms were Rs. 6509.11, Rs. 425.11 and Rs. 323.47 respectively and large dairy farms were Rs. 10669.72, Rs. 639.76 and Rs. 588.75 respectively. The total fixed cost of overall, small, medium and large dairy

farms were Rs. 9353.12, Rs. 5705.15, Rs. 10917.03 and Rs. 17862.65.

Table 5: Fixed costs among different categories of Dairy Farms (Rupees farm per annum)

Sl No	Frequency	Category of Farms			
		Small	Medium	Large	Overall
Fixed Cost					
1	Depreciation on Animals	3393.72	6509.11	10669.72	**5575.17**
2	Depreciation on Cattle shed	219.75	425.11	639.76	**357.59**
3	Depreciation on Equipment	182.52	323.47	588.75	**288.92**
4	Interest on Fixed Cost	1909.16	3659.34	5964.42	**3131.44**
	Total Fixed Cost	**5705.15**	**10917.03**	**17862.65**	**9353.12**

Returns Per Farm Per Month

Table 6 presents the return per farm per month across different categories of dairy farms. It shows that the overall return per farm per month was Rs. 143890.91. It also revealed that the return of Rs. 86336.73 per farm per month in small category of dairy farms, Rs. 168983.95 per farm per month in medium category of dairy farms and Rs. 276191.5 per farm per month in large category of dairy farms. The major share of income in all farm categories was derived from the sale of milk (Rs. 131224.94), which constituted the primary source of revenue for dairy farmers. Income from the sale of cattle contributed a smaller proportion (Rs. 11481.94) of the total return and occurred occasionally depending on the availability of calves, heifers, or culled animals. Similarly, manure sales (Rs. 1184.03) provided an additional income but comparatively minor source of income. The higher return in large farms might be attributed to higher milk production, and larger quantity of manure generated**,** which increased the overall income. Medium farms recorded moderate returns, while small farms had comparatively lower monthly returns due to limited herd size and lower production capacity.

Table 6: Returns per farm per month across various category of Dairy Farms

Sl No	Return	Category of Farms			
		Small	Medium	Large	Overall
1	Sale of Milk	80548.27	153437.81	247163.75	**131224.94**
		(93.30)	(90.80)	(89.49)	**(91.20)**
2	Sale of Manure/Cow dung	448.72	1495.54	2916.64	**1184.03**
		(0.52)	(0.89)	(1.06)	**(0.82)**
3	Sale of Cattle	5339.74	14050.6	26111.11	**11481.94**
		(6.18)	(8.31)	(9.45)	**(7.98)**
	Total	**86336.73**	**168983.95**	**276191.53**	**143890.91**

	(100.00)	**(100.00)**	**(100.00)**	**(100.00)**

The figures in parentheses indicate percentages to total

Cost and Returns Per Farm Per Month

The cost and returns across different categories of dairy farms is presented in Table 7. The total variable and fixed cost of overall, small, medium and large farms were Rs. 95660.47, Rs. 57069.79, Rs. 111736.09 and Rs. 187283.48. It was observed that the overall profit per farm per month was Rs. 48230.44. It also observed that the profit per farm per month increased from Rs. 29266.94from small farms to 57247.86in medium farms to Rs. 88908.02 in large dairy farms. This is obvious considering the increased of herd size. It was also found that the overall profit per farm per year was estimated as Rs. 578765.28. The profit per farm per year increased from Rs. 351203.28 from small farms to Rs. 686974.32 in medium farms to Rs. 1066896.24 in large dairy farms. The results indicate that profitability increases with farm size, as larger farms benefit from higher production levels and better utilization of resources. Income from milk sales constituted the major share of profit, while the sale of cattle and manure provided additional supplementary income to dairy farmers.

Table 7: Cost and Returns per farm per month across various category of Dairy Farms

Sl No	Cost and Return (in Rupees)	Category of Farms			
		Small	**Medium**	**Large**	**Overall**
1	Number of Farms	104	112	24	240
2	Total Return/Farm/Month	86336.73	168983.95	276191.5	143890.91
3	Total Cost/Farm/Month (Variable Cost + Fixed Cost)	57069.79	111736.09	187283.48	95660.47
4	Profit/Farm/Month	29266.94	57247.86	88908.02	48230.44
5	Profit/Farm/Year	351203.28	686974.32	1066896.24	578765.28

CONCLUSION

The number of cattle in 240 sample dairy farms were found as 1729 (48.64%) milch cows, 112 (3.15%) dry cows, 464 (13.05%) heifers, 32 (0.90%) bulls, 1218 (34.26%) calves and a total of 3555 (100%) cattles. It was observed that most of the cattle in the area were crossbreed jersey because of the efficient production and suitable for local climatic condition. However, crossbreed Holstein Friesian cattle breed was also observed in the study area while none of the farms were having local breed of cattle. The overall milk

production from 240 dairy farms was reported as 20043 litres per day with average milk production of 11.59 litres per day per milch animal. Overall, the average milk production per farm in 240 sample dairy farms was estimated to be 83.51 litres per farm per day. The total milk production in 104 small dairy farms was reported as 5203 litres per day with average milk production of 11.34 litres per day per milch animal. The total milk production in 112 medium dairy farms was reported as 11150 litres per day with average milk production was 11.68 litres per day per milch animal.

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