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Assessment of socio-economic conditions of dairy farmers influenced by cooperative milk collection centre in Madhepura district, Bihar

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Abstract

The study examined the influence of cooperative milk collection centre on socio-economic conditions of farmers in Madhepura District, Bihar. The Dairy farmers sell their milk in bulk at Gausihala Chowk, a COMFED chilling plant. The primary data was gathered through a random sample method from a total of 120 cooperative farmers. The present collection centre covers 4 villages with approximately 1200 dairy farmers with more than 26 lakh litres of milk collected in the last 12 months. The average herd size was 4.17, 8.43 and 15.25 per small dairy farmer, medium dairy farmer and large dairy farmer, respectively. The major component of variable costs incurred were feed which includes green fodder, dry fodder, concentrates and grains. The average total variable cost incurred by per dairy farmer per year was ₹ 140614.00, ₹ 355097.00 and ₹ 623110.00 for small, medium and large dairy farmer, respectively. The total cost of producing milk per dairy farmer per year was ₹ 146149.75, ₹ 367828.13 and ₹ 644107.63 for small, medium and large dairy farmers, respectively. The net return obtained per farmer per year was ₹ 38345.25, ₹ 76188.37 and ₹ 249750.37 by small, medium and large dairy farmer, respectively.

Keywords: cooperative milk collection centers, small, medium and large dairy farmers, feed, average herd size, net returns

Introduction

Agriculture is the most important activity, as it is not only the world's most reliable supply of food (Mukherjee and Vasudev, 2014) ^[4] but also provides huge employment in many developing countries (Shuya and Sharma, 2014; Gadad, 2015) ^[7, 2]. About 61.5% of the 1300 million Indian population is rural and dependent on agriculture (Agricultural Census, 2011). Overexploitation of natural resources occurred as a result of ongoing and intensive agriculture techniques to satisfy the goal of achieving food security. In this context, the dairy industry as an allied agricultural sector plays a critical role in the Indian economy, as milk is the second largest agricultural product and contributes significantly to GNP. Besides this, dairy farming provides farmers with not only off-season employment, but also a consistent stream of money throughout the year. (Sarker and Ghosh, 2008) ^[6].

Per capita consumption of cereal grains has been static or declining in recent years, although it has increased dramatically in the case of livestock products. (Kumar *et al.* 2011) ^[3]. Agro-based industries maintained a key position in the industrial sector during the early phases of economic growth (Yasmeen *et al.* 2016) ^[10]. Dairy farming in India has evolved from a family-run business to a well-organized industry with technological specialities (Simranjit *et al.* 2017) ^[8]. Dairy cooperatives are an important aspect of India's dairy development and milk marketing efforts, which began in 1970 with "Operation Flood" (Gadad, 2015) ^[2]. The milk cooperative is a critical component of the rural economy's overall development. Despite the fact that it began in the 1970s, it was ineffective across the country (Singh and Pundir, 2000) ^[9]. The establishment of cooperative dairy farms has improved the rural economic position in states such as Gujarat, Tamil Nadu, Maharashtra, and Karnataka (Benni, 2005) ^[1]. These states have adopted an AMUL-style cooperative structure, which includes (i) the State Milk Marketing Federation at the state level, (ii) the District Milk Producer Co-operatives Union at the district level, and (iii) the Primary Milk Producer's Cooperative Society at the village level. This structure existed in Bihar as well, starting in 1983 with the Bihar State Milk Co-Operative Federation Ltd. However, in Bihar, private or non-cooperative dairy is common. The study of a new cooperative milk collection centre that was started against the backdrop of the agricultural environment in a state like Bihar is particularly relevant in this context.

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Despite the fact that the centre is not completely functional as a Primary Milk Producer's Co-operative Society, it has the potential to grow. The study would shed light on the scope of coverage provided by cooperative milk collection centre, allowing academics and policymakers to formulate and implement appropriate policies for a balanced and integrated agricultural development. It also expands the knowledge base of cooperative dairying operations in the state of Bihar.

Material and Methods

The study area and the cooperative milk collection centre was purposively selected as the milk cooperative centre had newly started. The study was predominantly based on primary data

that were collected by using pretested questionnaire. 120 cooperative dairy farmers and agricultural farmers were randomly selected for getting primary data and the secondary information were also collected from the Secretary of the Cooperative Society. Dairy farmers were being further categorized under the three heads small dairy farmers (less than 5 milking animals), medium dairy farmers (5-10 milking animals) and large dairy farmers (more than 10 milking animals). The collected data were coded, classified so that the findings become meaningful. Budgeting technique was used for working out the Benefit-cost Ratio of the milk production.

Result and Discussions

Table 1: List of villages and number of dairy farmers under cooperative milk collection centre

S. No.	Village Name	Small dairy farmers		Medium dairy farmers		Large dairy farmers	
		No. of dairy farmers	Percentage (%)	No. of dairy farmers	Percentage (%)	No. of dairy farmers	Percentage (%)
1	Mirganj	95	32.76	166	29.54	129	37.07
2	Dighi	82	28.28	153	27.22	88	25.29
3	Rahta	68	23.44	149	26.51	68	19.54
4	Belari	45	15.52	94	16.73	63	18.10
	Total	290	100.00	562	100.00	348	100.00

Source: Author's estimation based on field survey data

The secondary data revealed that the milk collection cooperative namely Sudha Dairy was started in March, 1997 in Murliganj block, Madhepura district. It was started with 50 farmers for saving them from the exploitation by the traditional traders and middlemen. The timings of milk collection were 7 am to 10 am and 6 pm to 8:30 pm. The collected milk was sent to the Gaushala chowk chilling plant and then those were sent to different processing units. In recent period the centre covers 4 villages with more than 1200 dairy farmers and total milk collected in last 6 months was 17 lakh litres. The distribution of milk producing farmers in different villages has been shown in table 1. It can be noticed that most of the milk producing farmers under the collection

centre were from Mirganj (32.76%, 29.54% and 37.07% small, medium and large dairy farmers, respectively), Dighi (28.28%, 27.22% and 25.29% small, medium and large dairy farmers, respectively) and Rahta (23.44%, 26.51% and 19.54% small, medium and large dairy farmers, respectively) villages and in the case of Belari village (15.52%, 16.73% and 18.10% small, medium and large dairy farmers, respectively), the number of farmers were low. It was mainly due to the fact that Mirganj, Dighi and Rahta are adjoining villages of the collection centre, But Belari is far away (about 10 km) so the numbers of cooperative dairy farmers were very low in the cooperative centre.

Table 2: Composition of dairy animals of sample dairy farmer

S. No.	Animal categories	Small Dairy Farmer		Medium Dairy Farmer		Large Dairy Farmer	
		Total number of animals	Number of milking animal	Total number of animals	Number of milking animal	Total number of animals	Number of milking animal
1.	Local						
(a)	Buffalo	10	8	46	36	48	39
(b)	Cow	93	72	167	141	271	244
2.	Improved						
(a)	Buffalo	6	5	14	11	27	23
(b)	Cow	29	25	82	65	191	176
3.	Sheep/ goat	29	25	28	24	73	56
	Total	167	135	337	272	610	538
	Avg. herd size per farmer	4.18	3.38	8.43	6.80	15.25	13.45

Source: Author's estimation based on field survey data

There were a variety of dairy animals in the research region. As a result, dairy farming is a significant source of supplementary revenue for farmers in the study area. The details about the composition of dairy animals of sample farmers and per farmer average herd size are presented in Table 2.

It is noticed from table 2 that the total number of local buffalo were 10, 46 and 48 in case of small, medium and large dairy farmers, respectively. The total number of the local cows were 93, 167 and 271 in case of small, medium and large dairy farmers, respectively. The number of improved buffaloes were 6, 14 and 27 in case of small, medium and

large dairy farmers, respectively. The number of improved cow were 29, 82 and 191 in case of small, medium and large dairy farmers, respectively. The average herd size was 4.18, 8.43 and 15.25 per small dairy farmer, medium dairy farmer and large dairy farmer, respectively.

The number of local dairy animals were more than improved animals, it was might be due to the sample farmers' lack of understanding about dairy production and their incorrect opinion of improved animals as they need more feeding, being more prone to diseases, and having watery milk. These findings are in line with the results obtained by Sana and Mukherjee (2020) [5]. Also, number of buffaloes were very

less than number of cows and other dairy animals, it might be due to higher purchase cost and maintenance cost of buffalo

and lack of green fodder and grazing lands.

Table 3: Cost involved in milk production (per farmer per annum)

S. No.	Particulars	Unit	Small dairy farmers		Medium dairy farmers		Large dairy farmers	
			Quantity/Year	Cost/year (₹)	Quantity/year	Cost/year (₹)	Quantity/year	Cost/year (₹)
A	Variable cost							
1.	Green Fodder	Kg	15,238.75	30,477.50	30,751.25	61,502.50	55,662.50	1,11,325.00
2.	Dry Fodder	Kg	1,219.10	12,191.00	3,690.15	36,901.50	6,679.50	66,795.00
3.	Concentrates	Kg	7,619.38	91,432.50	15,375.63	1,84,507.50	27,831.25	3,33,975.00
4.	Grains	Kg	3,047.75	6,095.50	6,150.25	12,300.50	11,132.50	22,265.00
5.	Labour	Man-Days	0	0.00	1	48,500.00	2	76,000.00
6.	Veterinary & medicine	₹		417.50		1,685.00		3,050.00
7.	Transportation cost	₹		0.00		9,700.00		9,700
8.	Miscellaneous cost	₹		0.00		0		0
A	<i>Total Variable Cost</i>	₹		1,40,614.00		3,55,097.00		6,23,110.00
B	Fixed cost							
1	Depreciation on buildings	₹		835.50		1,685.00		2,287.50
2	Depreciation on animals	₹		4197.50		9,888.75		16,801.25
3	Interest on Fixed cost (10%)	₹		503.30		1,157.38		1,908.88
B	<i>Total Fixed Cost</i>	₹		5536.30		12,731.13		20,997.63
	<i>Total cost (A+B)</i>	₹		1,46,150.30		3,67,828.13		6,44,107.63

Source: Author's estimation based on field survey data

The money spent for purchasing various inputs in milk production is presented in table 3. The different inputs of dairy farming are dry fodder, green fodder, grains, concentrates, veterinary medicines and labour charges etc.

Total variable cost incurred per farmer per annum of small, medium and large dairy farmer was ₹ 140614.00, ₹ 355097.00 and ₹ 623110.00, respectively in dairy farming. The major items of variable costs were green fodder, concentrate, grain and dry fodder. The maximum cost contributed by green fodder i.e., ₹ 30477.50, ₹ 61502.50 and ₹ 111325.00 under respective dairy farmers. The concentrates also contributed huge cost that was ₹ 91432.50, ₹ 184507.50 and ₹ 333975.00 of small, medium and large dairy farmers, respectively. It is because concentrates are responsible for high milk productivity. The main objective of any type of farming is to

maximize the production. In case of dairy farming, it can be achieved by feeding the dairy animal with optimum rate.

Thus, the costs for feed contributes more than half of the costs of dairy farming. The fixed cost of dairy farm is depreciation on building and animals. The cost of depreciation on building and animals of small dairy farmer were ₹ 835.50 and ₹ 4197.50, respectively, of medium dairy farmers were ₹ 1685.00 and ₹ 9888.75, respectively and of large dairy farmers were ₹ 2287.50 and ₹ 16801.25, respectively. The interest on the fixed capital of small, medium and large dairy farmers was ₹ 503.30, ₹ 1157.38 and ₹ 1908.88, respectively. The total cost for dairy farming by small, medium and large dairy farmers were ₹ 146150.30, ₹ 367828.13 and ₹ 644107.63.

Table 4: Returns from milk production (average herd size per annum)

S. No.	Particulars	Unit	Unit cost	Small Dairy Farmer		Medium Dairy Farmer		Large Dairy Farmer	
				Quantity/ year	Returns/ year	Quantity/ year	Returns/ year	Quantity/ Year	Returns /year
1.	Sale of milk	Litre	31	4,635.00	1,43,685.00	11,146.50	3,45,541.50	22,473.00	6,96,663.00
2.	Sale of dung	Tonn	2000	15.23	30,460.00	30.75	61,500.00	55.66	1,11,320.00
3.	Sale of calves	Numbers	7500	1.38	10350.00	4.93	36,975.00	11.45	85,875.00
	Gross return	₹			1,84,495.00		4,44,016.50		8,93,858.00
	Net return	₹			38,344.70		76,188.37		2,49,750.37

Source: Author's estimation based on field survey data

The returns from dairy farming come from selling of milk, dung (used as fuel and for preparing manure) and calves. The details regarding the returns from the dairy farming are presented in Table 4.

In the return section of the dairy farming, the maximum returns come from sale of milk which were ₹ 143685.00, ₹ 345541.50 and ₹ 696663.00 per year per small dairy farmer, of medium dairy farmer and large dairy farmer, respectively. The returns from of sale of calves and sale of manure per small dairy farmer per year were ₹ 10350.00 and ₹ 30460.00, respectively, per medium dairy farmer per year were ₹ 36975.00 and ₹ 61500.00, respectively and per large dairy farmer per year were ₹ 85875.00 and ₹ 111320.00, respectively. The gross returns obtained per year was ₹

184495.00, ₹ 444016.50 and ₹ 893858.00 per small, medium and large dairy farmer, respectively. The net return per small, medium and large dairy farmer was ₹ 38344.70, ₹ 76188.37 and ₹ 249750.37 per year, respectively. So, it could be said that from the dairy farming, the farmers can achieve a huge amount of profit side by side of agriculture that helps for improving their economic condition.

Conclusion

The research revealed that as the distance from the cooperative milk collection centre increases, the number of dairy farmers drops. As a result, this approach can be implemented in any hamlet. Non-dairy farmers should be encouraged to start dairy operations in order to increase their

revenue. In this situation, the members of the centre could serve as role models for non-dairy farmers. Aside from that, the following suggestions can be used to improve the performance of cooperative centres.

1. Because there are so few buffalos being raised, farmers should be encouraged to increase the number of buffalos being raised.
2. Dairy animal production efficiency may be improved through the selection of upgraded animals that produce more milk than native breeds.
3. Using current dairy farming methods and techniques (quality feed and other scientific equipment) that are absolutely lacking in the research area, there is potential for cost reduction in milk output.
4. In the study region, the government should focus on improving emergency veterinary services and artificial insemination facilities.

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