



Garrett scoring technique for assessing the constraints faced by dairy farmers of Madhepura district, Bihar

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ARTICLE INFO	ABSTRACT
<p>Received : 08 November 2021 Revised : 23 January 2022 Accepted : 07 February 2022</p> <p>Available online: 17 April 2022</p> <p>Key Words: Dairy farmers Economic constraints Garrett scoring technique Marketing constraints</p>	<p>The present investigation is entitled as Garrett scoring technique for assessing the constraints faced by dairy farmers of Madhepura district, Bihar. The primary data were collected from 120 cooperative farmers through the random sampling method. During the study, various constraints under economics and marketing of milk were evaluated as per the response of sample dairy farmers of the study area. Major economic constraints recognised among the group of sample farmers were higher cost of cattle feed, easy availability of veterinary facilities, high cost of the improved animal, while major marketing constraints were low price of milk, lack of suitable transportation, delay in getting milk price. It was also found that the number of dairy farmers decreased in the cooperative milk collection centre with the increase of distance. There was also scope for reduction in the cost of milk production by using modern methods and technologies of dairy farming that was completely absent in the study area.</p>

Introduction

Dairy farming is the major component of livestock farming. It has a long tradition in our country. Cow, buffalo and goat are the main domesticated dairy animals. In many nations, agriculturists regard the promotion of the milk production system as one of the most widely favoured paths to rural and overall economic development. It provides dairy farmers with a consistent source of revenue at a low-risk level (FAO, 2017). The care and management of milking animals provide socially desirable work opportunities. Nowadays people sell milk where the market is available. Many small dairy plants also have been established in rural areas. Dairy farming is developing as a dairy enterprise in many parts of our country. In the state of Bihar, milk production is a significant source of income among small and marginal farmers. Small dairy farmers produce around 80% of the total milk. Bihar's share of the total milk in India rose from 3.2% in 2001–02 to 5.2% in 2018–19 (Department of Animal Husbandry, Dairying and Fisheries, 2020). Most of the dairy farmers sell their milk in milk collection

centres for earning a good income. The Bihar State Milk Co-Operative Federation Ltd. (COMFED) is supporting dairy farmers in various ways for decades. This research has been done to throw some light on the constraints faced by the dairy farmers while selling milk to the milk cooperatives and some suggestions will be given to cope with problems and enhance income in the dairy sectors.

Material and Methods

The present study involves the detailed sampling design nature and mode of collection of data and analytical tools employed in achieving the objective of the study. The present research was taken up in the Madhepura district of Bihar. The study area and the cooperative milk collection centre was purposively selected as the milk cooperative centre as it is newly started in the study area. The study was predominantly based on primary data that were collected by using a pretested questionnaire. 120 cooperative dairy farmers were randomly selected for getting primary data and some secondary

information were also collected from the Secretary of the Cooperative Society. Dairy farmers were being further categorized under 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. Garratt ranking tool is applied for analysis of constraints faced by respondents.

Research objective

This study was for potential beneficiaries from those villages which had not much awareness about cooperative milk-collection centres. It will also be helpful to small and medium farmers to provide interest in dairy farming as a security against any failure of agriculture crops and it can help farmers to get additional income through milk production. Dairy cooperatives replace all the action of middlemen which helps the farmers to get the proper value of their produce. Dairy plays a very vital role in increasing farmers' income (Gadad *et al.*, 2020). The demand for milk and milk products is increasing day by day due to rapid population growth and urbanization. But, because of inadequate milk supply and ill management of its marketing system, still, dairy farmers are suffering from "Milk Holiday". Milk holidays become more severe, farmers of this study area are facing this problem due to various reasons: Banda, Strike and other technical problems of the adequate alternative milk market. There is a lack of reasonable prices of milk products in the local market. So, the farmers increase their consumption (Shuya *et al.*, 2014).

Keeping view of the above points, data through questionnaire investigations were conducted in with following objectives:

1. To study the demographic conditions of dairy farmers in the study area.
2. To identify constraints and suggestions of the respondent in the study area.

Tools of analysis

The total number of respondents was fixed as 120. The samples were randomly collected from the farmers from every one of these communes, which were dispensed a few of the four villages *viz.*, Mirganj, Dighi, Rahta and Belari in probability proportion. The respondents have been decided on at random in every village. The sample farmers under each category were decided on in proportion

to their respective total population, the chosen villages with the pattern respondents in every of the selected villages are furnished in the following Table 1.

Scoring technique

To study the constraints faced by the dairy farmers in running dairy farm and marketing of milk, the scoring technique was adopted, as suggested by Garrett for converting the ranks into scores, when the preference of a particular constraint differ from respondent to respondent. The conversion method was as follows:

As a first step the per cent position of each rank was found out by the given formula:

$$\text{Percent position} = \frac{100 (\text{Rij} - 0.5)}{N_j}$$

Where,

Rij = Rank given for ith item by the jth individual

Nj = Numbers of items ranked by jth individual

The percent position was then converted into scores by referring to the table given by Garrett. Following this procedure, the order of merit given by each of the respondents as the problems in the financial management of dairy farms and marketing of milk was converted into scores. Then for each reason, the scores of individual respondents were added together and divided by the total number of respondents were added. These mean scores for all reasons were arranged in descending order and ranks were given. By this method, the accuracy in determining the preference was obtained.

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

SN	Village Name	Number of dairy farmers		
		Small	Medium	Large
1.	Mirganj	10	10	10
2.	Dighi	10	10	10
3.	Rahta	10	10	10
4.	Belari	10	10	10
	Total	40	40	40

Results and Discussion

Economic constraints faced by Dairy farmers

The study has shown the various economic problems faced by dairy farmers. From Table 3, it could be seen that six problems were identified by

the respondents. It could be observed that the higher cost of cattle feed was ranked as the foremost reason which caused difficulties in obtaining better income for dairy farmers. Poor health services and no easy availability of veterinary facilities were ranked second. Farmers also stated that they were facing problems due to the high cost of improved animals and ranked this third. Lack of loan facilities, lack of nutritional fodder and lack of technical facility were ranked 4th, 5th and 6th respectively.

Rank estimation

The samples were collected randomly from small, medium and large dairy farmers of the Madhepura district. The sample size is fixed to 120. Where, the number of small, medium and large farmers were 40 in each category. It can be simply understood by considering the following Table 1.

Table 2 describes the total rank given by each respondent on different factors which causes problems in the management of the dairy farm. From Table 2, it is observed that maximum respondents *i.e.*, 34 respondents were given 1st rank to one problem that is the high cost of the improved animal. On the other hand, the 2nd highest rank given to another problem that is the higher cost of cattle feed, and so on which briefly explains the rank given by the total dairy farmers on different factors which causes problems on maintaining the dairy farm.

Percent Position Value Estimation

Percent position values were calculated by considering the formula *i.e.*, $100(R_{ij}-0.5)/N_j$; to evaluate the Garrett value, the percent position value was essential to rank the exact causes for a particular phenomenon or problem.

Estimation of the total score given by sample dairy farmers

The total score of each factor rank will be estimated by multiplying the Garrett value with the respect given value. Hence, the total score is essential to calculate the average score given by the total respondents under different factors of a particular phenomenon. Table 4 describes the calculation procedures of the Total Score of the sample respondents. The total score was calculated by multiplying Garrett Value with the respective rank given by the respondents on each factor of the sample. Hence, on the first rank, the Garrett value

is 77 and the number of respondents given Rank 1 is 34. So, by multiplying this two, we were getting the total score *i.e.*, 2618. Hence, all the estimation processes go in the same direction on every factor with their respective rank given by the number of respondents.

Estimation of Average Score

Under Garrett value ranking techniques, the average score will be calculated by dividing the total score by the total respondents of the selected sample. The highest percentage average score indicates the 1st rank whereas the lowest percentage average score indicates the last rank of the total estimated factors rank. The study has shown the various problems in obtaining institutional credit, which is presented in Table 5. From this table, it could be seen that six problems were identified by the respondents. Out of those six, the higher cost of cattle feed was ranked as the foremost one which caused inconvenience to the dairy farmers in maintaining the cattle. This might be due to the lesser availability of grazing lands because the majority of the farmers in the research region were landless and marginal. In recent years, population growth, industrialization, and urbanization have all contributed to a scarcity of grazing land. These results are in line with Singh *et al.* (2000), Gopi *et al.* (2020). The lack of veterinary facilities was the next most significant restriction. Manivannan (2008) also mentioned a lack of effective field-level extension support for livestock-related operations. Policymakers and administrators can take the required steps to replace vacant Veterinary Assistant Surgeons posts at the block or village level, and the Veterinary University and Animal Husbandry Department can execute appropriate awareness initiatives about the latest dairy technologies. The problem of the high cost of improved breed of animal was ranked third. Because improved breeds are harder to get by in the study area, farmers are forced to buy them from other states, raising the animal's cost. The sample farmers also faced problems in lending loans for their dairy business, which ranked fourth. Because the majority of farmers in the research area are marginal and small, a problem with loan lending could be attributed to a lack of documentation and items for a mortgage by the farmers. Lack of nutritional fodder and technical facility was at rank fifth and sixth, respectively. These results are in conformation with Paudel (2014).

Table 2: Rank estimation of total sample dairy farmers

SN	Problems	R1	R2	R3	R4	R5	R6	TOTAL
1	High cost of improved animal	34	11	15	20	14	26	120
2	Higher cost of cattle feed	27	34	17	11	20	11	120
3	Easy availability of veterinary facilities	15	24	25	25	21	10	120
4	Lack of loan facility	13	19	29	22	21	16	120
5	Lack of technical facility	11	14	14	22	27	32	120
6	Lack of nutritional fodder	24	17	16	15	16	32	120

Source: Primary source, *Note: R1- Rank 1, R2- Rank 2 and so on.

Table 3: Estimation of Garrett value for each percent position value

Rank	$100(R_{ij}-0.5)/N_j$	Percent Position Value	Garrett Value
R1	$100(1-0.5)/6$	8.33	77
R2	$100(2-0.5)/6$	25.00	63
R3	$100(3-0.5)/6$	41.67	54
R4	$100(4-0.5)/6$	58.33	46
R5	$100(5-0.5)/6$	75.00	37
R6	$100(6-0.5)/6$	91.7	23

Table 4: Estimation of total score by multiplying Garrett value with the respective rank Garrett value

SN	Problems	R1*77	R2*63	R3*54	R4*46	R5*37	R6*23	TOTAL
1	High cost of improved animal	2618	693	810	920	518	598	6157
2	Higher cost of cattle feed	2079	2142	918	506	740	253	6638
3	Easy availability of veterinary facilities	1155	1512	1350	1150	777	230	6174
4	Lack of loan facility	1001	1197	1566	1012	777	368	5921
5	Lack of technical facility	847	882	756	1012	999	736	5232
6	Lack of nutritional fodder	1848	1071	864	690	592	736	5801

Source: Primary survey

*Note: R1*77 means Total number of respondents given first factor as Rank 1 multiply with respective Garrett value i.e.,77 and others are estimated like that.

Table 5: Estimation of average score of the total sample dairy farmers

SN	Problems	Total	Average score	Rank
1	High cost of improved animal	6157	51.31	3 rd
2	Higher cost of cattle feed	6638	55.32	1 st
3	Easy availability of veterinary facilities	6174	51.45	2 nd
4	Lack of loan facility	5921	49.34	4 th
5	Lack of technical facility	5232	43.60	6 th
6	Lack of nutritional fodder	5801	48.34	5 th

Source: Primary Survey

*Note: Average Score = Total score/ Total Respondents

Marketing constraints faced by dairy farmers

The study has shown the various marketing problems faced by dairy farmers. From Table 6 it could be seen that five marketing problems were identified by the respondents. It could be observed that the low price of milk was ranked as the foremost reason which affect the prices received by dairy farmers in milk marketing. Lack of suitable

transportation facility was ranked second as some of them live far away from the collection centre. Farmers also stated that they are facing problems due to delays in getting the price of milk and ranked this third. Milk holiday and timing of milk collection and measurement of milk at collection centre were ranked 4th and 5th, respectively in milk marketing.

Rank estimation

The samples were collected randomly from small, medium and large dairy farmers of the Madhepura district. The sample size is fixed to 120. Where, the number of small, medium and large farmers were 40 in each category. It can be simply understood by considering the following Table 6. Table 6 describes the total rank given by each respondent on different factors which caused the problem in marketing and sales of milk to the milk cooperative

centre. It was observed that maximum respondents i.e., 39 dairy farmers were given 1st rank to the lesser prices paid by milk cooperative. On the other hand, the 2nd highest rank was given to lack of suitable vehicle for carrying milk to cooperative centre and so on which briefly explain the rank given by the total sample dairy farmers on different factors which causes problems in selling milk to cooperative centre.

Table 6: Rank estimation of total sample dairy farmers.

SN	Constraints	R1	R2	R3	R4	R5	TOTAL
1	Lack of suitable transport	29	37	26	19	11	120
2	Low price of milk	39	35	18	13	13	120
3	Delay in getting price of milk	24	22	44	13	17	120
4	Milk holiday	14	13	15	35	43	120
5	Timing of milk collection	10	13	15	40	42	120

Source: Primary source

*Note: R1- Rank 1, R2- Rank 2 and so on.

Table 7: Estimation of Garrett value for each percent position value.

Rank	$100(R_{ij}-0.5)/N_j$	Percent Position Value	Garrett Value
R1	$100(1-0.5)/5$	10.00	75
R2	$100(2-0.5)/5$	30.00	60
R3	$100(3-0.5)/5$	50.00	50
R4	$100(4-0.5)/5$	70.00	40
R5	$100(5-0.5)/5$	90.00	24

Table 8: Estimation of total score by multiplying Garrett value with the respective rank Garrett value.

SN	Problems	R1*75	R2*60	R3*50	R4*40	R5*24	TOTAL
1	Lack of suitable transport	2175	2220	1300	760	264	6719
2	Low price of milk	2925	2100	900	520	312	6777
3	Delay in getting price of milk	1800	1320	2200	520	408	6248
4	Milk holiday	1050	780	750	1400	1032	5012
5	Timing of milk collection	750	780	750	1600	1008	4888

Source: Primary survey

*Note: R1*77 means Total number of respondents given first factor as Rank 1 multiply with respective Garrett value i.e.,77 and others are estimated like that.

Table 9: Estimation of average score of the total respondents.

SN	Problems	Total	Average score	Rank
1	Lack of suitable transport	6719	55.99	2 nd
2	Low price of milk	6777	56.47	1 st
3	Delay in getting price of milk	6248	52.07	3 rd
4	Milk holiday	5012	41.77	4 th
5	Timing of milk collection	4888	40.73	5 th

Source: Primary Survey

*Note: Average Score = Total score/ Total Respondents

Percent position value estimation

Percent position values were calculated by considering the formula i.e., $100(R_{ij}-0.5)/N_j$; to evaluate the Garrett value, the percent position value is essential to rank the exact causes for a particular phenomenon or problem.

Estimation of Total Score given by Sample respondents

The total score of each factor rank will be estimated by multiplying the Garrett value with the respect given value. Hence, the total score is essential to calculate the average score given by the total respondents under different factors of a particular phenomenon. Table 8 describes the calculation procedures of the Total Score of the sample respondents. The total score is calculated by multiplying Garrett Value with the respective rank given by the respondents on each factor of the sample. Hence, on the first rank, the Garrett value is 75 and the number of respondents given Rank 1 is 39. So, by multiplying this two, we are getting the total score i.e., 2925. Hence, all the estimation processes go in the same direction on every factor with their respective rank given by the number of dairy farmers.

Estimation of Average Score

Under Garrett value ranking techniques, the average score will be calculated by dividing the total score by the total sample of dairy farmers. The highest percentage average score indicates the 1st rank whereas the lowest percentage average score indicates the last rank of the total estimated factors rank. The study had shown the various problems in marketing and sales of milk to the cooperative centre, which is presented in Table 9. From this table, it could be seen that five marketing problems were identified by the dairy farmers. Out of those, lower prices of milk paid by cooperative was ranked as the foremost one. These results might be due to the huge difference between buying and

selling prices of milk by the milk cooperative. Similar results were also validated by Paudel (2014). The non-availability of automated milk transporting vehicles ranked second. Lack of knowledge and non-availability of advanced mechanized vehicles among dairy farmers for milk transportation in the study region lead to acidification of milk due to higher temperature exposure (Paudel, 2014). The third most challenging problem faced by dairy farmers was a delay in credit of milk price by the cooperative. Some other factors responsible for causing problems in the marketing of milk were milk holidays due to strike or banda, improper timings of milk collection by the cooperative as identified by the sample dairy farmers. Farmers suffer a significant loss in this case since there is no other milk market. Despite their desire to sell their extra milk output, farmers are obligated to consume it.

Conclusion

The present investigation was focused on identifying the various constraints faced by the sample dairy farmers in the study area. Therefore, based on the survey, interview and secondary data it can be concluded that dairy farmers of Madhepura district were facing both economic and marketing constraints in selling milk to milk cooperative recentres and running the dairy business. In economic constraints, high cost of improved animals, cattle feed, lack of veterinary facilities were found commonly in the study area. Dairy farmers are getting lower prices for the milk, lack of transporting vehicles, delay in credit of money were the major marketing constraints.

Conflict of interest

The authors declare that they have no conflict of interest.

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