



Socio-economic Determinants Influence on NiliRavi Buffalo Farmers Choice of Milk Marketing Channels in Punjab

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ABSTRACT

A total of 120 NiliRavi buffalo farmers from two districts of Punjab were selected for the study. The average production, consumption and marketed surplus of the milk are found to be higher for the Firozpur farmers in comparison with their counterpart. About 70 per cent of NiliRavi farmers preferred organised marketing channels to dispose surplus milk. The distance of dairy cooperatives (Govt. or Private) / dairy FPOs with regular & assured market and support in availing loan for purchase of animals and inputs were main reasons for opting organised marketing channels. Advance payment for purchase of inputs and door step milk collection were important factors for choosing unorganised milk marketing channels. The results of binomial logistic regression revealed that Nili-Ravi farmer with younger age and large number of NiliRavi milch buffalo holdings preferred organised milk marketing channels to dispose surplus milk rather than unorganised channels. The organised milk marketing channels needs to be strengthened and promoted for regular and assured milk marketing and also use these channels as centre for the supply of NiliRavi superior germplasm to propagate their population.

INTRODUCTION

In India, milk production has grown at a compound annual growth rate of about 6.2 per cent to reach 209.96 million tonnes in 2020-21 (Economic Survey, 2021-22). The milk contributes about 65 per cent of value added income in the livestock sector. In India, every one fifth of the agriculture income comes from dairy farming. The value of output from milk increased from Rs. 88,092 crores in 1999-00 to the Rs. 4,95,841 crores in 2017-18, which is higher than the value of output from food grains (Economic Survey, 2018-19). India endowed with 19 buffalo breeds with a total population of 109.9 million headcounts (NBAGR and Livestock census, 2019). In which about 54.60 per cent of the buffaloes are descript type and remaining are non-descript (Breed Survey, 2019). Among descript type about 42.80 per cent of

buffaloes are Murrah type followed by Mehsana (4.00%), Surti (2.20%), Jaffrabadi (1.90%), Bhadawari (1.80%), Banni (0.70%), Pandharpuri (0.50%), Marathwadi (0.20%) & NiliRavi (0.62%) (Breed Survey, 2019). It clearly indicates that Murrah type buffaloes are dominating buffalo breed in the country due to its higher milk yield and better fat. However, NiliRavi breed is also comparable with well-known Murrah buffalo in terms of productive and reproductive parameters. A NiliRavi breed is more adaptive to adverse climatic conditions and converts poor roughages into nutritious and quality food (Ismal et al., 2020). Despite good qualities of the breed, NiliRavi buffalo population is declining drastically and breed characters have been diluted as a result of mixing with other breeds in the country (Vij & Tantia, 2005). The NiliRavi breeding tract is found in Amritsar, Firozpur and Gurdaspur districts of Punjab (Kathiravan et al., 2007).

Punjab state experienced decline in the crop husbandry income and shrunken employment opportunities because of over exploitation of the resources under rice-wheat cropping system (Dhanda et al., 2022). The state recorded 133.47 lakh tonnes of milk production with per capita availability of 1035 grams per day, highest in the country (NDDDB). In the state, about 56.76 per cent of the milk is produced by buffaloes followed by crossbred (39.98%) and indigenous cows (3.26) (BAHS, 2021). The state has reported second highest average monthly income from animal husbandry with the amount of Rs. 5,303 and in which 91.6 per cent of the total income comes from milk production alone (NSSO, 2013). The income standards of dairy farmers mainly depends on choice of milk marketing channels and selling price of the milk. Progressive milk producers, enroute milk supervisors, friends, relatives being major information source (Singh et al., 2014), the organised marketing suffers. In Punjab, there are two types of marketing channels for dispose of surplus milk i.e., un-organized/traditional and organized channels. Un-organized milk marketing channels are milk vendors, halwaies, tea shops etc. whereas organized milk marketing channels are dairy co-operatives, private companies, dairy Farmers’ Producers Organizations (FPOs) etc. Therefore, marketing of the surplus milk of NiliRavi buffaloes plays critical role in acceptance and propagation of the buffalo breed in the state. Hence, in the present study, socio-economic characteristics of the Nili-Ravi buffalo farmers and their influence on the choice of milk marketing channels in Punjab state was conducted.

METHODOLOGY

A multi stage stratified sampling technique was used. At the first stage, Punjab was selected purposively as it is the breeding tract of NiliRavi buffalo. In the second stage, two districts namely Firozpur and Sangrur were selected based on the highest NiliRavi buffalo population in breeding and non-breeding tract of the breed, respectively. In the third stage, Firozpur & Guru Har Sahai blocks from Firozpur district and Sangrur & Bhawanigarh blocks from Sangrur district were selected, respectively. In the final stage, 30 NiliRavi buffalo farmers from each block were selected randomly purposively. The dairy farmer with at-least one NiliRavi in-milk buffalo during data collection was considered as NiliRavi buffalo farmer. In the present study, a total of 120 Nil-Ravi buffalo farmers were interviewed personally with the help of structured pre-tested interview schedule to furnish the required information.

The analysis was done using descriptive statistics, Garret Ranking Technique (GRT) (Garret & Woodworth, 1969) and binomial logistic regression. Using Garret chart per cent position was converted into scores.

A binomial logistic regression was used to recognize the discrete choice nature of the dependent variable (Karli et al., 2006; Priscilla et al., 2016; Gogoi et al., 2022). The model postulates that P_i , the probability that i^{th} NiliRavi buffalo farmer choice of the milk marketing channel is a function of an index variable Z_i , summarizing a set of explanatory variables. Z_i is equal to the logarithm of the odds ratio, i.e., the ratio of probability that NiliRavi buffalo farmers likely to choose the organised milk marketing channels to the probability that they choose the un-organised milk marketing channels. Z_i is expressed as a linear function of explanatory variables X_i . Mathematically, the logistic regression model is expressed as:

$$P_i = F(Z_i) = F(X_i) = \frac{1}{1 + e^{-Z_i}}$$

$$Z_i = \ln\left\{\frac{P_i}{1 - P_i}\right\} = \alpha + \sum_{k=1}^M \beta_k X_{ki}$$

Where, P_i = Probability that i^{th} NiliRavi buffalo farmer chose the organised milk marketing channel, $i = 1, 2, \dots, N$ = Number of NiliRavi buffalo farmers, $k = 1, 2, \dots, M$ = Number of explanatory variables, α = constant, β = unknown parameter

The parameters used in the regression model were estimated using the maximum likelihood method. The index variable Z_i indicating whether NiliRavi buffalo farmer chose the organised or unorganised milk marketing channel is linear combination of a set of explanatory variables and the functional form for the same is given below:

$$Z_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_6 X_{6i}$$

RESULTS AND DISCUSSION

Milk production, consumption and marketed surplus

The production, family consumption and marketed surplus of milk among NiliRavi farmers in Firozpur and Sangrur district are depicted in the Table 2. Overall the average milk production, family consumption and marketed surplus per day per household were found to be 14.45, 5.20 and 9.25 kg, respectively. The milk used for family consumption includes milk consumed as raw milk as well as in the form of milk products (such as curd, lassi, ghee etc.). There is statistically significant difference between the average milk production, consumption and marketed surplus among the NiliRavi dairy farmers of Firozpur and Sangrur district. This difference may be due to greater number of NiliRavi buffalo holdings in Firozpur district than in Sangrur district. The per cent of marketed surplus to the total milk production was found to be 64.81 and 62.98 per cent in Firozpur and Sangrur district

Table 1. Average milk production, consumption and marketed surplus among NiliRavi buffalo farmers

S.No.	Particulars	Firozpur	Sangrur	Overall	Z-statistics
1	Milk production (kg/household)	16.15	12.74	14.45	1.68**
2	Milk used for family consumption (kg/household)	5.68	4.72	5.20	2.56***
3	Marketed surplus of milk (kg/household)	10.47	13.03	9.25	1.72**
4	Marketed surplus as per cent of household milk production (%)	64.81	62.98	64.00	-

** and *** Indicates that significant at 5 and 1% level of confidence

respectively. Even in entire Punjab state, one-third of the milk was found to be consumed at households and two-third portion of the milk was available as marketed surplus (Brar et al., 2018).

Different milk marketing channels

Milk is a highly perishable commodity and needs to dispose surplus milk as early as possible. Two important milk marketing channels i.e., organised and un-organised milk marketing channels. In the present study, about 70.83 and 29.17 per cent of the NiliRavi farmers preferred organised and un-organised milk marketing channels, respectively to dispose surplus milk. Among the selected districts, about 60.00 and 40.00 per cent of the NiliRavi buffalo farmers in Firozpur and Sangrur district prefer organised milk marketing channels, respectively. The remaining 40.00 and 18.33 per cent of the NiliRavi farmers in Firozpur and Sangrur, respectively prefer un-organised milk marketing channels. In Sangrur district most of the dairy farmers prefer organised milk marketing channels because of well-established dairy cooperative network system in the district. However, the majority of the NiliRavi buffalo farmers in both the districts preferred organised milk marketing channels.

Reasons to choose different milk marketing channels

The reasons for the choice of organised milk marketing channels were depicted in the Table 3. The regular and assured market for the dispose of surplus milk is ranked first reason with

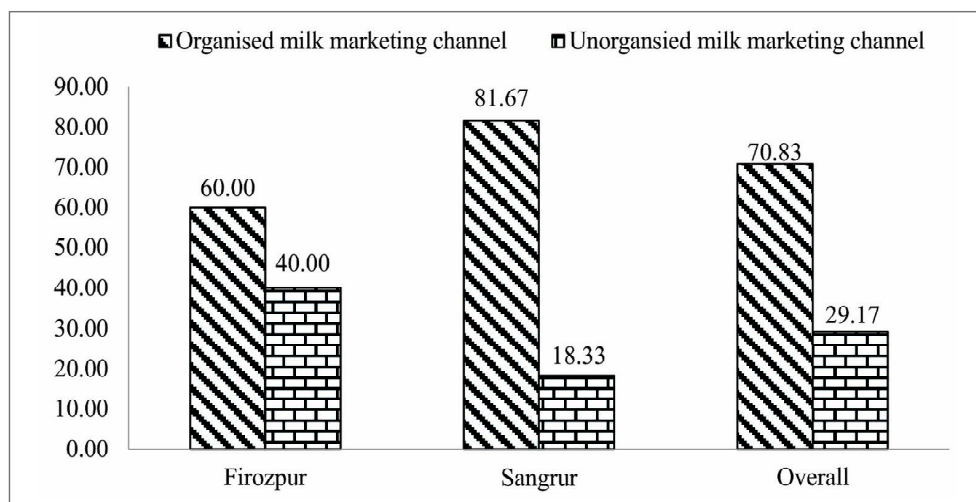
highest Garret score. The sampled NiliRavi buffalo farmers felt that secured and guaranteed market for sale of surplus milk is necessary for sustainable income from buffalo husbandry. The regular & timely payment is the second most important reason to choose organised milk marketing channels. Regular & timely payments help the dairy farmers in purchasing the required inputs for milk production in time. Dairy cooperatives (government/private) and dairy FPOs make payment on fortnight basis to the dairy farmers. The third reason to choose organised milk marketing channel is for its support in availing dairy farm loan. Many landless, small and marginal farmers join the organised milk marketing channels with expectations of getting loan from financial institutions assisted by these organised milk marketing channels. The distance of the milk society from the farm is fourth major reason for the choice of organised milk marketing channels followed by transparency in quality checks, provides veterinary services, less variation in milk price, milk society is run by localites and unavailability of unorganised milk marketing channels based on the Garret ranking score. This study observed that there was no difference between reasons for choice of organised milk marketing channels among NiliRavi farmers of both Firozpur and Sangrur district.

The important reasons to choose the un-organised milk marketing channels among the NiliRavi buffalo farmers in Firozpur and Sangrur district is depicted in Table 4. Door step milk collection is first and foremost reason to sell milk to un-organised milk

Table 3. Reasons to choose organised milk marketing channels by NiliRavi buffalo farmers

S.No.	Parameters	Total score	Mean score	Rank
1	Regular and assured market	6414	75.46	1
2	Regular and timely payment	6075	71.47	2
3	Assistance in availing dairy farm loan	5100	60.00	3
4	Society is near to my home	4188	49.27	4
5	Transparency in quality checks	4172	49.08	5
6	Provides veterinary services	4040	47.53	6
7	Less variation in milk price	3735	43.94	7
8	Society is run by my relative/friend/localite	3477	40.91	8
9	Provides input at low cost	3448	40.56	9
10	No other market options	1457	17.14	10

Figure 1. Choice of milk marketing channels among NiliRavi farmers in Punjab



marketing channels. The NiliRavi farmers with greater operational land holdings prefer unorganised milk marketing channels because farmers are busy in agriculture activities throughout the year. The second important reason is to avail advance amount for the purchase of farm inputs. In unorganised milk marketing channels, milk vendors and halwaias provide advance amount to dairy farmers in order to lure these famers towards them. The regular and timely payment is the third important reason to select unorganised milk marketing channel followed by regular & assured market, transparency in quality checks, less variation in milk price, vendor/processor is well known & trustworthy, provide inputs at low cost, no strict quality checks and no other market options. Among the respondents, the transparency in milk quality checks has important role and ranked five on Garret score in both organised and unorganised milk marketing channels selection. Like organised milk marketing channels, the reasons to opt unorganised milk marketing channels are also not different among NiliRavi farmers of Firozpur and Sangrur district.

Socio-economic determinants influencing choice of milk marketing channel

The binomial logistic regression results of how socio-economic characteristics influence the NiliRavi buffalo farmers to choose different milk marketing channels is depicted in Table 5. The results revealed that parameters like educational level, marketed surplus of milk and number of milch NiliRavi buffalo holdings has positive influence on the NiliRavi buffalo farmers to become member of the organised milk marketing society. Whereas, other variables like land holdings, age of the respondents and family size

Table 4. Reasons to choose unorganised milk marketing channels by NiliRavi buffalo farmers

S.No.	Parameters	Mean score	Rank
1	Door step milk collection	71.66	1
2	Provide advance to purchase inputs	69.09	2
3	Regular and timely payment	65.40	3
4	Regular and assured market	63.80	4
5	Transparency in quality checks	51.03	5
6	Less variation in milk price	48.00	6
7	Vendor/processor is well known and trustworthy person	41.43	7
8	Provide input at low cost	37.43	8
9	No strict quality checks	30.14	9
10	No other market options	17.00	10

Table 5. Socio-economic determinants of NiliRavi buffalo farmers in choice of milk marketing channels

Parameters	Estimated coefficient	Standard error	P-value
Constant	-1.272	0.023	0.373
Age of the NiliRavi buffalo farmer (X ₁)	-0.049	0.082	0.035**
Educational level of the respondents (X ₂)	0.137	1.427	0.637
Family size (X ₃)	-0.039	0.274	0.711
Number of NiliRavi buffaloes (X ₄)	0.101	0.026	0.054**
Land holdings (X ₅)	-0.051	0.048	0.536
Marketed surplus of milk (X ₆)	0.030	0.137	0.318

Note: **indicates significant at 5% level

have negative relationship in preference for the organised milk marketing channels. The results are partially supported by Singh et al., (2016). However, in the present study, age of the respondents and number of the NiliRavi holdings found to be statistically significant. It implies that NiliRavi farmers with young age and large number of NiliRavi buffalo holdings prefer organised milk marketing channels to dispose surplus milk.

CONCLUSION

In the present study, it was found that NiliRavi buffalo farmers of Firozpur district possess greater number of NiliRavi buffaloes with large operational land holdings in comparison with NiliRavi farmers in Sangrur. Due to large number of NiliRavi buffaloes, the average milk production, milk consumption at household level and marketed surplus is found to be higher for the farmers in Firozpur district in comparison with their counterparts. Among the selected NiliRavi buffalo farmers, about 70.83 and 29.17 per cent of them preferred organised and unorganised milk marketing channels, respectively for disposing surplus milk. The binomial logistic regression revealed that young NiliRavi buffalo farmers with large number of NiliRavi buffalo holdings prefer organised milk marketing channels to dispose surplus milk. Therefore, this study calls for strengthening organised milk marketing channels for regular & assured market for milk as well as to use these channels in the supply chain of NiliRavi superior germplasm to propagate its population in this breeding tract.

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