Socioeconomic Status and its Association with Economic Motivation among the Dairy Entrepreneurs of Kerala

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ABSTRACT

The study analyzed the socioeconomic variables of the dairy entrepreneurs of Kerala (India) and their relationship with economic motivation; specifically, in the three physiographical regions of highland, midland and lowland. Data were collected through survey using structured interview. The results revealed that maximum number of dairy entrepreneurs were male and belonged to elderly group. They were educated mostly up to secondary level and had dairying experience of fewer than 13 years. Largely herd size was between 12-22 animals; and possession of farm assets was weaker than household assets. Majority of the entrepreneurs had gross annual income of below ₹25 lakh from sale of milk and milk products; and local/private sales were more beneficial than co-operative sales. The results showed variance in the socioeconomic variables among the three divisions and hence demands exclusive entrepreneurship development strategies. Regression analysis showed that while milk production and household assets were positively related; experience and sales to dairy cooperatives were negatively related to the economic motivation of the dairy entrepreneurs.

INTRODUCTION

Kerala state ranks 14th among the milk-producing states of the country; with a share of just 1.5 percent of the total milk production. The annual milk production of the state is undulating with a recent reduction from 25.48 lakh MT (2018-19) to 25.44 lakh MT (2019-20), along with the per capita availability of milk declining from 200 g/day to 198 g/day during the same period (NDDB, 2021); which is far below the national average of 406 g/day and the RDA of 300 g/day endorsed by ICMR (NIN, 2020). The figures indicate the gap in requirement and availability; which is estimated to be 34%. The floods in Kerala during 2018 and 2019 affected milk production by loss of cattle; destruction of fodder plots and cattle sheds; reflected in the decrease in milk procurement by dairy co-operatives (GoK, 2019). Also the advent of the COVID-19 pandemic disrupted the

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procurement and marketing systems; and decelerated the race of the state to attain milk self-sufficiency in the subsequent years.

A study conducted by the Kerala State Planning Board with the technical consultancy of the National Council of Applied Economics Research (NCAER) found that if the growth trend in the number of in-milk animals and milk yield continues to be the same in the future (business-as-usual scenario), total milk production would decline to 19.13 lakh MT in 2030 from 27.91 lakh MT of 2012-13 (GoK, 2014). The major constraints to increasing production, productivity and profitability of milk production in the state are increased price of cattle feed, non-remunerative price of milk, high cost of credit, lack of cattle management skills and green/dry fodder shortage (Sreeram et al., 2018). The key challenge is to make the sector remunerative. A crucial element to address these constraints is to facilitate entrepreneurial initiative, business linkages and know-how to ensure competitiveness. This requires the transformation of small livelihood family dairy farms in Kerala (owning 87.7% of the total cattle of the state) into highly competitive market-oriented small to medium-sized commercial dairy farms. (GoK, 2014). Also another document released by Government of Kerala reiterates this phase shift to entrepreneurship with encouragement to establish profitable dairy farms. (GoK, 2019).

The above analysis and recommendations on the dairy scenario of Kerala demand appropriate interventions in developing entrepreneurship to enhance and manage the milk production gap for the future on one hand; and project dairying as a profitable and venturesome enterprise for employment generation on the other. For this, it is important to understand the present socioeconomic status of the dairy entrepreneurs of the state so that policies and plans can be framed to facilitate their growth from the present level to highly commercial entrepreneurs; and promote the entry of fresh dairy entrepreneurs. Further, the economic motivation of the dairy entrepreneurs was studied as it has a predictive capacity regarding the willingness to become an entrepreneur; along with the relationship of the socioeconomic variables to it.

METHODOLOGY

The study followed a Survey Research Design (non-experimental) using cross-sectional survey. It used structured interviews for data collection, with the intent of generalizing from a sample to a population (Sivakumar et al., 2017). The respondents were dairy entrepreneurs operationally defined as 'a person engaged in dairying activity who has a minimum herd size of 4 crossbred dairy animals, selling 75

percent of the produced milk per day to the market throughout the year and the sold milk is not less than 10 liters per day'. Data was collected from 240 dairy entrepreneurs during 2019-20; 80 each from the physiographic divisions of highland, midland and lowland (CESS, 1984) selected randomly from 4 blocks each of three districts. The districts were Wayanad (highland), Ernakulam (midland) and Thiruvananthapuram (lowland).

The variables studied were gender, age, education, land holding, herd size, possession of assets (household and farm), annual income, experience in dairying, milk production and sales; and economic motivation. Direct questioning and structured schedules were used for the measurement of the variables. Economic motivation was operationally defined 'as the degree to which a dairy entrepreneur was oriented towards profit maximization in dairy farming and the relative value placed by the entrepreneur on economic ends'. The scale developed by Supe and Singh (1969) was used with adequate modifications. It consisted of six statements (5 positive and 1 negative) with response categories from

strongly agree to strongly disagree with scores ranging from 5 and 1 for positive statements and reverse for negative statement.

The respondents were classified into three categories using Cumulative Square Root of Frequency (CSRF) method (MTC, 2001) for family size, experience, herd details, possession of household and farm assets, annual income, milk production and milk sales. Age was classified in accordance with National Youth Policy (GoI, 2003). Education was classified as per Indian standard classification of education (GoI, 2014) and land holding based on agriculture census (GoI, 2016). Gender and ownership of assets were expressed using frequency and percentage. The expected frequencies of economic motivation were classified into equal class intervals and the respondents were categorized into low, medium and high using mean and standard deviation.

FINDINGS AND DISCUSSION

The results of the study are discussed below with added tables and figures followed by description.

Table 1: Distribution of Respondents According to Age, Gender, Education, Family Size and Experience in Dairying

Variables	Categories	Highland (n=80)		Midland (n=80)		Lowland (n=80)		Total (n=240)	
		F	%	F	%	F	%	F	%
Age	Young (Up to 35 years)	8	10.00	6	7.50	7	8.75	21	8.75
	Middle (36-50 years)	39	48.75	39	48.75	28	35	106	44.17
	Elderly (>50 years)	33	41.25	35	43.75	45	56.25	113	47.08
	Mean	48.93		49.45		50.32		49.57	
	SD	9.40		9.08		9.87		9.43	
Gender	Male	64	80.00	63	78.75	52	65.00	179	74.60
	Female	16	20.00	17	21.25	28	35.00	61	25.40
Education (Years of study)	Illiterate (0)	0	0.00	0	0.00	3	3.75	3	1.25
	Primary(1-5)	2	2.50	1	1.25	6	7.50	9	3.75
	Upper Primary (6-8)	11	13.50	6	7.50	10	12.50	27	11.25
	Secondary (9-10)	32	40.00	26	32.50	28	40.00	86	35.80
	Sr. Secondary (11-12)	19	23.75	17	21.25	10	12.50	46	19.20
	Graduate(13-15)	13	16.25	25	31.25	18	22.50	56	23.35
	PG and above(>15)	3	3.75	5	6.25	5	6.25	13	5.40
	Mean	10.95		12		10.56		11.17	
	SD	2.73		2.76		3.91		3.23	
Family Size	Large(>7)	7	8.75	0	0.00	4	5.00	11	4.60
	Medium (5-7)	43	53.75	45	56.25	32	40.00	120	50.00
	Small (<5)	30	37.50	35	43.75	44	55.00	109	45.40
	Mean	5.1		4.6		4.6		4.8	
	SD	1.84		1.06		1.55		1.53	
Experience in dairying (Years)	High (> 25)	16	20.00	13	16.25	15	18.75	44	18.30
	Medium (13-25)	24	30.00	18	22.50	23	28.75	65	20.10
	Low (< 13)	40	50.00	49	61.25	42	52.50	131	54.60
	Mean	13.96		12.74		14.31		13.67	
	SD	10.48		10.23		10.06		10.23	

From Table1, it could be seen that most of the respondents belonged to elderly age group of above 50 years; Majority of the dairy entrepreneurs were male;. A higher number of the respondents in the three regions had studied up to secondary level ; There was difference in family size between the three regions, with lowland having majority of small families (55%); while highland and midland having more medium sized families (5-7 members); Majority of the dairy entrepreneurs in the three regions had low experience of below 13 years, which meant that there was increase in new entrants to this sector since last two decades, which is positive.

The average land holding was higher in highland, followed by midland and lowland as presented in Table 2. The average operational land holding of Kerala as per Agricultural Census was 0.22 ha (GoI, 2016). Hence it was inferred that the dairy entrepreneurs of the three regions were holding comparatively more land when matched with the average land holding of the state. A glance at the table shows that a good percentage of entrepreneurs in both highland and midland were having fodder cultivation; but the per capita land area was below 1 ha. Though as per NDDB (2016), only 43% of dairy farmers cultivated fodder; the study showed that a higher percentage of dairy entrepreneurs (81.25%) cultivated fodder. It is understood that the entrepreneurs recognize the significance of fodder cultivation more than dairy farmers.

Table 2. Distribution of Respondents Based on Landholding, Land Under Fodder and Possession of Cross-Bred Animals

Variables	Categories	Highland (n=80)		Midland (n=80)		Lowland (n=80)		Total (n=240)	
		F	%	F	%	F	%		%
Landholding	Marginal (< 1 ha)	42	52.50	63	78.75	76	95.00	181	75.30
	Small (1-1.99 ha)	18	22.50	14	17.50	4	5.00	36	15.00
	Semi Medium (2-3.99ha)	13	16.25	3	3.75	0	0.00	16	6.70
	Medium (4-9.99 ha)	7	8.75	0	0.00	0	0.00	7	3.00
	Large (> 10 ha)	0	0.00	0	0.00	0	0.00	0	0.00
	Mean	1.46		0.56		0.26		0.76	
	SD	1.65		0.55		0.33		1.14	

Variables	Categories	Highland (n=80)		Midland (n=80)		Lowland (n=80)		Total (n=240)	
		F	%	F	%	F	%		%
	SD	1.65		0.55		0.33		1.14	
Land Under Fodder	No Fodder	2	2.50	17	21.25	26	32.50	45	18.75
	Below 1 ha	60	75.00	57	71.25	53	66.25	170	70.85
	1 ha to 1.99 ha	13	16.25	4	5.00	1	1.25	18	7.50
	2 ha to 3.99 ha	5	6.25	2	2.50	0	0	7	2.90
	Above 4 ha	0	0	0	0	0	0	0	0.00
	Mean	0.71		0.39		0.19		0.46	
	SD	0.58		0.42		0.25		0.51	
Cross bred animals	High(>22)	16	20.00	20	25.00	10	12.50	46	19.20
	Medium (12 -22)	35	43.75	31	38.75	32	40.00	98	40.80
	Low (<12)	29	36.25	29	36.25	38	47.50	96	40.00
	Mean	17.69		18.75		16.39		17.61	
	SD	15.68		12.16		20.81		16.56	

Crossbred Animals

Kerala has the highest crossbred cattle population; where 94% of the cattle are crossbred (GoI, 2020). Majority of the herd strength as per the study was medium (12-22 animals) in highland and midland region; while majority was low (47.50%) in lowland with a stock below 12 animals. The average number of crossbred animals in the three regions did not have any noteworthy difference with the mean of 16-18 animals. The number of indigenous animals was very low and among all the respondents only 12 had kept them. And 42 respondents had kept buffalo; but mostly for the purpose of meat than for milk.

Possession of Assets

Majority of the entrepreneurs had owned television, mobiles, refrigerator and two-wheelers as household assets. The possession of each and every item was comparatively higher in midland and lower in lowland. Washing machine and four-wheelers were also possessed by nearly 40% of the entrepreneurs; with their numbers relatively less in lowland. Data presented in Fig 1 shows that more number of entrepreneurs of the highland used farm

equipment; while lowland numbers were the least. About 68.80% of highland and 58.80% of lowland entrepreneurs used milking machine; while it was only 19% in lowland, where there was more dependency on milkers. Rubber mat was possessed by a larger number of entrepreneurs in the three regions. From the figure, it is clear that the highland entrepreneurs adopted technology at a faster rate and the lowland entrepreneurs were mostly traditional. The midland dairy entrepreneurs were in the middle of them.
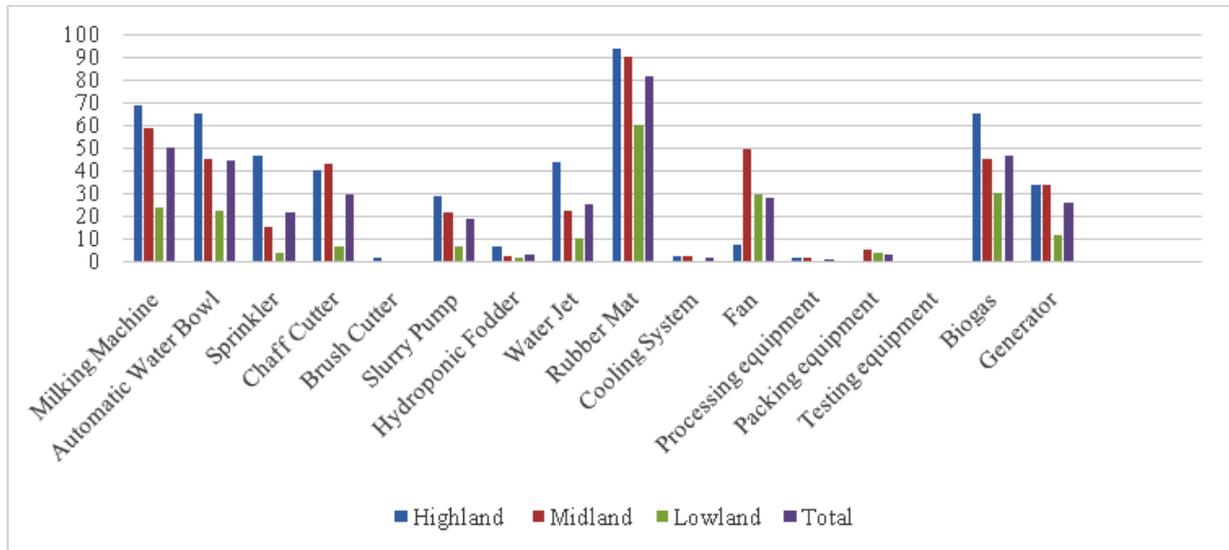

Fig 1: Possession of Dairy Farm Assets

Milk Production Per Household

Majority of the dairy entrepreneurs produced less than 200 litres per day (above 65% in all regions) on their farms, while few were producing between 200-1200 litres/day. Only one entrepreneur each in highland and lowland had production above 1200 litres as seen in Table 3. The average production was lowest in lowland owing to the less productive animals and lag in technology adoption by the entrepreneurs in coastal areas. Sreeram et al (2018) in their study noted average milk production of 13.1 litres per day and Prasad et al (2017) found the milk production range between 10-15 litres per day among the dairy farmers of Kerala. The milk production was higher among dairy entrepreneurs and in the present study the average per day was 116.90 litres.

Annual Income from Milk and Milk Product Sales

The gross annual income from the sale of milk and milk products is divulged in the table. Majority of the entrepreneurs belonged to the low income category of below ₹25 lakh in the three regions. The number of entrepreneurs in each category

was comparable in the three regions. The net income received depended on the cost of production; and an earlier survey by Kerala Cooperative Milk Marketing Federation pegged ₹ 28 as the average production cost per litre of milk when the price paid to cooperative member was ₹30-32 (NDDB, 2016). It was apparent that the profit margins were less in dairying and gain to the entrepreneur was through local sales, where a better price was received than cooperatives. Also, the income was directly proportional to the herd size of the entrepreneur and the productivity of his crossbred animals.

Table 3. Distribution of Households Based on Milk Production and Annual Income from Milk Sales

Variables	Categories	Highland (n=80)		Midland (n=80)		Lowland (n=80)		Total (n=240)	
		F	%	F	%	F	%	F	%
Milk Production (Litres)	High(> 1200)	1	1.25	0	0.00	1	1.25	2	0.85
	Medium (200-1200)	10	12.50	12	15.00	5	6.25	27	11.25
	Low (< 200)	69	86.25	68	85.00	74	92.50	211	87.90
	Mean	123.55		128.50		98.65		116.90	
	SD	158.53		113.88		180.97		153.59	
Annual Income from Milk sales (in Lakh)	High (>₹75 lakh)	1	1.25	1	1.25	1	1.25	3	1.25
	Medium (₹25-₹75 lakh)	12	15.00	20	25.00	9	11.25	41	17.10
	Low (<₹25 lakh)	67	83.75	59	73.75	70	87.5	196	81.65
	Mean	16.50		19.56		13.93		16.66	
	SD	21.71		17.66		23.22		21.03	

Milk Sales to Dairy Cooperatives

Similar to production, the sales to dairy cooperatives were also following the trend where majority entrepreneurs were pouring less than 200 litres of milk to dairy cooperatives in the three regions. The average sales were higher in highland; while no marked difference in midland and lowland. There was no notable difference in the average price paid by cooperatives in

the three regions; as the same price chart was followed by the three cooperative milk unions of Kerala.

Local Sales of Milk

The highest percentage of entrepreneurs in highland (82.50%) did not have local sales; as the region lacked market due to surplus local milk production. A smaller number of entrepreneurs (17.50%) sold milk below 30 litres locally in the highland region. But local sales were comparatively higher in midland and lowland region. The average local sales were highest in midland region; evident from the fact that the entrepreneur travels more distance to sell milk (2.16 km) and gains higher price (₹50) when compared with the other regions. The gains in dairying for the entrepreneur were mainly through local sales as there was an average difference of ₹11.23 between the price received from cooperatives and local sales.

Entrepreneurs selling milk to Private agencies

Apart from cooperatives and local sales, dairy entrepreneurs also sold milk to private dairies, vendors, milkers and to other entrepreneurs. The number of entrepreneurs involved in these sales is also given in Table 4. Only very few undertook these sales (that too only in midland and lowland); where the price received was higher than the cooperatives. The entrepreneurs also travelled a longer distance (average 1.87 km) for these sales.

Economic Motivation: Majority of the entrepreneurs belonged to medium category of economic motivation in the three regions (Table 4). Exception was with the midland entrepreneurs having equal levels of high and medium economic motivation (48.75% each). There were very negligible entrepreneurs with low economic motivation. It was understood that the dairy entrepreneurs of Kerala state had taken up dairying not as an ancillary source, but a primary source with the motivation to get adequate monetary returns. The results agree with the findings of Sarita et al (2016) and Khuman et al (2014), who studied about the dairy farmers of Haryana and Assam respectively.

Table 4: Distribution of Respondents Based on Economic Motivation

Categories	Highland (n=80)		Midland (n=80)		Lowland (n=80)		Total (n=240)	
	F	%	F	%	F	%	F	%
High (>21)	32	40.00	39	48.75	23	28.75	94	39.20
Medium (14-21)	48	60.00	39	48.75	55	68.75	142	59.20
Low (<14)	0	0.00	2	2.50	2	2.50	4	1.60

The results of the multiple regression analysis to estimate the relationship between economic motivation of the dairy entrepreneurs and the socioeconomic variables are given in Table 5.

Table 5. Correlates of Dairy Entrepreneur's Economic Motivation
(Multiple Linear Regression Estimates)

Dependent variable	Economic motivation
Education	0.11(0.076)
Experience (log)	-1.17***(0.23)
Gender (1/0)	-0.50(0.49)
Family Size	-0.12(0.12)
Milk production (log)	0.80*(0.31)
Share of milk sold to DCS	-3.07**(0.96)
Share of milk sold to PDP	-0.73(2.69)
Dairy Farm Assets (log)	0.076(0.19)
Household Assets Value (log)	0.56*(0.23)
Area (Base: Midland)	
Highland	0.33(0.55)
Lowland	-0.72(0.53)
Constant term	14.1***(3.00)
N	219
R^2	0.38
adj. R^2	0.35
F	14.8

Standard errors in parentheses
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The table shows that experience and economic motivation were negatively and significantly correlated; which means that as age advances, orientation towards profit maximization was less among dairy entrepreneurs. Young dairy entrepreneurs have higher economic motivation. Milk production and economic motivation were positively related; which indicate that if the milk produced by the entrepreneur household was more, then higher was his relative value on economic ends. It was also seen that higher the milk sales to the dairy cooperatives (DCS), lower was the economic motivation as it was a risk free market option for the dairy entrepreneurs. Further, household assets and economic motivation was positively related; higher the economic motivation then higher the assets. The area (Midland, Lowland and Highland) doesn't assert economic motivation; though it is higher in highland.

Other variables didn't have any significant relation with economic motivation of the dairy entrepreneur.

CONCLUSION

The study concluded that at present, dairying was more of an elderly male-dominated enterprise in Kerala; and hence necessitates attracting youth and women to the sector through inventive dairy entrepreneurship development activities. The higher education level and lower family size of entrepreneurs shall encourage increasing herd size to establish commercial family farms; provided there is timely and adequate government support. Despite limited land holding, dairy entrepreneurs were inclined to fodder cultivation; wherein usage of leased land, common property resources, intercropping, seasonal fodder crops and fodder conservation techniques shall assure required fodder availability. The interest of the entrepreneur is limited to crossbred cattle; which suggests refining germplasm using semen of higher exotic inheritance, sexed semen, embryo transfer etc. The entrepreneurs had possession of indispensable household assets, but were deficient in dairy farm assets; which can be enhanced through technical and financial support. Though gross income from dairying was superior, the cost of production pulls it down to subsistence level of net income. Cost reduction techniques require immediate attention in extension. The less experience of the dairy entrepreneur is attributed to their late entry to the sector; which recommends motivating and assisting youth for early farm establishment. The data outcomes point to support the dairy entrepreneurs to sell more milk locally and to private agencies than cooperatives to raise income. Majority of the entrepreneurs had medium level of economic motivation; and among the socioeconomic variables, experience in dairying and milk sales to dairy cooperatives had significant and negative relationship; while milk production and household assets had positive relationship with economic motivation. The three physiographical divisions had their own merits and demerits for dairying, and hence urge separate development strategies for self-reliance in dairying.

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