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Sustainability of migratory pastoralism through value addition during Covid-19 pandemic in Kachchh district

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ABSTRACT

This study was conducted among the Maldhari community to understand the sustainability of migratory pastoralism during Covid-19. Bhuj and Lakpat Talukas of Kachchh district, Gujarat were selected to study the effect of profile variables on the annual income and net income of the families. The study revealed that family size and taluka were the significant factors influencing total income whereas taluka was the only significant factor influencing net income. Due to reduced sale of milk resulting from Covid-19, most of the milk was converted into *khoa* and the income generated from its sale was the major source of income for the migratory families. Cow dung fetched a minimal price which served as major source of their livelihood with no input cost. The value addition with better marketing facilities can significantly enhance the income of the pastoralists in the Kachchh district.

Keywords: Covid-19, Migratory, Net income, Total income, Value addition

The Indian pastoralism has not been studied extensively; the nomenclature as well as different terminologies are not well documented (Blench 2001). Marginalization, whether through the expansion of cities, mechanization in agriculture sector following the Green Revolution, has meant that pastoralists had to constantly shift in search of other production landscapes during their mobility (Sharma *et al*. 2003, Axelby 2016, Mehta and Srivastava 2019). However, it is strongly believed that without the participation of the pastoral people, the Sustainable Development Goals of the United Nations cannot be achieved in the regions where pastoral people live (Cordone *et al*. 2009).

The present study was conducted in the Lakhpat and Bhuj taluka of Kachchh district of Gujarat which is predominantly the home of Maldhari Community. Banni grassland is spread over Lakhpat and Bhuj taluka and it covers about 2600 sq km area which is the largest natural tropical semi-arid grassland in Indian subcontinent (Banni 2018, Ramble 2018). Maldharis have existed in this region from more than past 400 years and the area witnesses extreme heat in summers to floods during monsoons and biting cold in winters (Kumar *et al*. 2015). The major source of income for the community is from livestock rearing which is also the predominant occupation for the pastoralists (Manjunatha *et al.* 2019*)*. Maldharis value pastoralism and their animals as a 'way of life' and not just an income source. They value the adaptation, feed diversity, health and wellbeing and not just the milk production (Raina and Dey 2016).

The restrictions imposed on free travel during Covid-19 affected the livelihoods of millions of pastoralists. It deprived the pastoralists of grazing areas as well as significantly affected their income. Therefore, this study was undertaken to identify the parameters contributing significantly to net income of the Maldharis, the social cultural aspects of the community and to study the value addition being done by utilizing the limited resources. The study will be another step in contributing to doubling the tribal and rural sector income in present context (Chand 2017).

MATERIALS AND METHODS

Research design: The survey was conducted in Bhuj and Lakhpat talukas from August 2019- March 2020 over a period of 8 months and data of 28 respondents were collected.

Location of the study: Kachchh is an arid district in the north-west of Gujarat which has a total of 10 talukas (Sub-Districts) and 877 inhabited villages. The Kachchh located between 22°44'8" to 24°41'30" North latitude and 68°7'23" and 71°46'45" East, forms the western most part of India and constitutes the Kachchh district of Gujarat state. This district has occupied 45652 sq. km area of Gujarat state. This district has 10 talukas namely Bhuj, Gandhidham, Anjar, Rapar, Mandvi, Bhachau, Mundra, Nakhtrana, Abdasa and Lakhpat. The study was conducted in 5 different villages of Bhuj and Lakhpat talukas of Kachchh district. A detailed interview schedule was prepared to collect the data by personal interviews as well

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as group discussions; in addition, a detailed questionnaire form was also prepared to cover the data in a holistic approach. The net income was estimated on the basis of the data collected and the prices as prevailing in the year 2020 for different commodities.

Statistical analysis: A general linear model was implemented in SPSS v21.0 in order to determine the association between dependent variable, viz. total income and net income and various independent factors. Taluka was grouped into two, village into five, age into three, size of cattle herd into three and size of milch cattle herd into three categories whereas the family size was considered as a covariable. Analysis of variance (or Mean Sum of Squares values) was done and the consequent p-value was indicative of significant association with the dependent variable.

$$Y_{ijklmno} = T_i + V_j + A_k + C_l + b(F_m - F) + M_n + e_{ijklmno}$$

where, $Y_{ijklmno}$, total income (or Net income); T_i, i^{th} taluka; V_j, j^{th} village; A_k, k^{th} age; C_l, l^{th} size of cattle herd; $b(F_m - F)$, m^{th} family size taken as a covariable in the model; M_n, n^{th} size of milch cattle herd; $e_{ijklmno}$, random error.

RESULTS AND DISCUSSION

The socio-economic profile of Maldharis was studied and the distribution of respondents as per their socio-economic profile and selling prices of milk, *khoa* and cow dung is given in Table 1, 2 and 3 respectively. Approximately 46% of the Maldharis aged between 36 to 50 years were deriving their income from pastoralist system and primarily, livestock rearing. The family size varied significantly with most of families having 5 to 6 members corresponding to 57% of the total studied population and about half (46%) of the Maldhari farmers belonged to the middle age group (36-50 years of age). The study conducted by Kumar *et al.* (2013) reported 70.83% of the Maldhari dairy farmers belonged to the joint families and only 29.17% of them belonged to nuclear families which correlated with the results of present study where 57% families were medium sized which is similar to joint families. Nishi *et al*. (2011) in a study on age group of Maldhari farmers revealed that majority (70.83%) of them belonged to middle age group followed by old age and 14.17% were from young age group.

Table 1. Distribution of respondents as per their socio-economic profile (n=28)

Particular	Category	Frequency (f)	Percentage (%)
Age (years)	Young (Up to 35)	4	14.29
	Middle (36 to 50)	13	46.43
	Old (>50)	11	39.29
Family size (No. of members)	Small (Up to 4)	8	28.57
	Medium (5 to 6)	16	57.14
	Large (>6)	4	14.29
Herd size (No. of animals)	Small (Up to 70)	7	25.00
	Medium (71 to 101)	14	50.00
	Large (>101)	7	25.00
Milking cows (No. of animals in milking)	Small (Up to 23)	8	28.57
	Medium (24 to 35)	12	42.86
	Large (>35)	8	28.57
Milk yield (lit/day)	Low (Up to 135)	8	28.57
	Medium (136 to 202)	11	39.29
	High (>202)	9	32.14

Table 2. Average selling prices of milk, *khoa* and cow dung

Commodity	Mean
Average milk price (₹/lit.)	29
Average *khoa* price (₹/kg)	252
Average cow dung price (₹/Month)	3046

Table 3. Distribution of respondents according to the selling prices of milk, *khoa* and cow dung by them

Particular	Category	Frequency (f)	Percentage (%)
Average milk price (₹/lit.)	Less than 30	9	32.14
	Up to 30	12	42.86
	More than 30	7	25.00
Average *khoa* price (₹/Kg)	Less than 250	4	14.29
	Up to 250	10	35.71
	More than 250	14	50.00
Average cow dung price (₹ On th)	Less than 2000	2	7.14
	2000 to 3000	16	57.14
	More than 3000	10	35.71

Also, half of the pastoral families had herd size of 71 to 101 animals (50%) from which they had primary source of income for their livelihood. The number of milch cattle were little higher in medium size families (42%). In contrast to the present findings, Pagar (2011) reported that 45.83% of the Maldhari dairy farmers had small herd size followed by 43.33% of Maldhari dairy farmer possessing medium level of herd size while 10.84% of them had large herd size in a research carried out in Junagadh District.

Thus, milch cattle and family size were important factors contributing to the income of Maldharis. In one of the major studies, Jost (2002) also reported that the two most important contributors of animal husbandry in pastoralism are herd size and its composition. Both are considered as very important in relation to environmental conditions, need of pastoralist families and the need to minimize risk.

The net income of the Maldhari community ranged between ₹1 lakh to 2 lakhs in the selected talukas for the population studied. In another study on the Maldhari pastoralists, slightly higher net income has been reported in which 15% of families earned more than ₹2 lakhs whereas about 60% of the Maldhari dairy farmers belonged to medium level of annual income group, and the rest 25% of the families had less than ₹ one lakh income (Rani 2009).

The milk yield per day varied considerably according to the herd size owned by a family unit and it may be ranging from 95 L/day to 280 L/day with 32% pastoralist farmers

having more than 202 L/day from milking cows. The value addition in the form of *khoa* production and cow dung selling were important features of the study and Maldhari farmers derived much benefit from the sale of byproducts as shown in Table 3. Hartmann *et al.* (2009) also estimated that 60-80% of food and income sources of the pastoral communities is derived from livestock and livestock products (milk and ghee).

Due to insufficient storage facilities and considering lower shelf life of milk, the value addition is being regularly done by the Maldhari pastoralists by converting milk into *khoa* which is predominantly used in preparing Indian sweets. However, due to COVID 19, the sale of milk was reduced, hence, more of the milk was converted into byproducts like *khoa*. A little income was being derived from cow dung but it was not due to value addition of cow dung but simple collection of cow dung according to its quality. Average selling prices of milk, *khoa* and cow dung are given in Table 2. The prices are estimated by adding and taking the mean of different prices in different villages as collected by individual interviews. The significant income is generated from sale of milk and khoa whereas cow dung fetched a minimal price which is an additional benefit with no input cost. The further value addition of cow dung, cow urine and other products while providing better marketing facilities can significantly enhance the income of the pastoralists in the Kachchh district.

Further, distribution according to the selling prices of milk, *khoa* and cow dung as given in Table 3 showed the differences in prices in different families of the villages of Bhuj and Lakhpat talukas. The significant number of families were selling milk at a price up to ₹30 relating to 42% of the total number. The selling price of milk was little low as compared to previous years as the pastoralists were recovering from the Covid-19 pandemic. The positive sign for the economic prosperity of the area during pandemic and potentially in near future also is sale of *khoa* which was fetching more than ₹250/kg for 50% of the families in the area which stressed on the need of more value addition of cow products in near future. The additional income from cow dung was between ₹2000 to 3000 for 57% of the families and more than ₹3000 for 35% of the families in the studied population.

Factors affecting annual income of households: The general linear model was used to study the effect of different factors on Annual and Net income. A total of 6 dependent variables, viz. no. of milch cattle, family size, taluka, village, age and no. of cattle were used to study effect on independent variables, Annual and Net income of the families in the Bhuj and Lakhpat talukas. The annual income was estimated by summation of income received from milk, *khoa* and cow dung whereas in net income, the expenditure spent on cow in the form of feed and mineral mixture was subtracted from the annual income.

Family size and taluka were the significant factors influencing total income of the households with the inhabitants of Lakhpat taluka earning significantly higher than their counterparts in Bhuj taluka. It could be due to greater cattle size and milch cattle size with the former than the latter which consequently, results in higher productivity and earnings. In addition, the income generated from *khoa* was higher in Lakhpat taluka than the Bhuj taluka.

Taluka was the only significant factor influencing net income of the households with the inhabitants of Lakhpat taluka earning greater net income then their Bhuj counterparts. This could again be attributed to larger herd sizes in Lakhpat taluka which leads to higher total income and subsequently, higher net income.

Scanty literature was available on the research carried out in this aspect, which makes this study unique and one step ahead in betterment of the Maldharis or in general, pastoralists.

Maldharis in the Bhuj and Lakhpat taluka are rearing cattle since ages. In addition, they are also doing value addition in the form of *khoa* and cow dung which is helping them to fetch the extra income and making the whole system sustainable. But, due to lack of support in the form of policy interventions and acknowledging the role of Maldhari pastoralists in conservation and management of biodiversity and natural resources, the population of this esteemed community is declining at a rapid pace. In view of this, there is need for policy intervention both at the state and central level to develop measures for improving the livelihood options, education and skill development to youth and women for sustainable income and improving economic conditions of pastoralists. The policy regarding better market linkages between pastoralists and organized market by involving cooperatives, NGOs, SHGs, FPOs can be introduced to help them earn more income for their products. Similarly, awareness camps along the routes of pastoralists should be organized by state government to ensure the vaccination of their animals against FMD, Brucellosis etc. and for any other health query related to their animals. Further, the creation of special provisions for pastoralist rights for instance, a separate budget allocation especially, in case of disease outbreaks (Covid-19) or any other natural calamity is the need of the hour so that they can have enough fodder for their animals and their livelihood is not threatened.

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