



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(8): 1958-1962
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www.thepharmajournal.com

Received: 03-05-2023

Accepted: 05-06-2023

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Assessment of livelihood security of dairy farmers in aspirational districts of Karnataka

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Abstract

Dairying is one of the main source of livelihood and also provides nutritional support for millions of farmers in rural areas. India is still a developing country; several Indian areas are still underdeveloped. As a result, in 2018, Government of India under the NITI Aayog introduced the Aspirational Districts Programme (ADP), to identify the most underdeveloped districts of our country based on 49 Key Performance Indicators (KPI) under five thematic areas. In this context, the current study was carried out in the aspirational districts of Karnataka state viz. Raichur and Yadgir districts, determine how important dairying is for dairy producers' financial security. 200 respondents, including an equal number of dairy farmers and non-dairy farmers, were chosen at random to provide the primary data. To analyse the livelihood security of dairy farmers in aspirational districts a composite 'Livelihood Security Index' (LSI) was developed which consists of seven indicators. Propensity Score Matching (PSM) method was used to statistically compare dairy and non-dairy farmers. The study's key findings showed that most dairy farmers (52.00%) belonged to a medium level of livelihood security, whereas the majority of non-dairy farmers (43.00%) had low livelihood security. Dairy farmers had a composite index score of 0.68, which was higher than the 0.59 for non-dairy farmers. The PSM method showed that dairy producers' livelihood security is 14.10% higher than that of non-dairy farmers. According to the findings of the current study, dairy farmers in the aspirational districts of the state of Karnataka were found to have superior livelihood security than non-dairy farmers. Therefore, one of the crucial measures for ensuring the livelihood of farmers in our country's Aspirational districts is developing dairy-based developmental programs.

Keywords: Farmers, were chosen, dairy-based

1. Introduction

India is widely regarded as an agrarian nation, "Agriculture is not something we can stall temporarily. No matter what happens to the planet, life must go on. According to an economic report from 2021-22, the agriculture and related sector was the most resilient to the COVID-19 shock, growing by 3.6% in 2020-21 and 3.9% in 2021-22. The livestock sector, which makes up 25.60% of all agricultural GDP and 4.11 percent of the nation's GDP, is crucial to the growth of the Indian economy. India will have 304 million bovine population, 192.49 million cows, and 109.85 million buffaloes in the year 2020-21, making it the world's greatest milk producer. According to 20th livestock census, the State of Karnataka comprises of 84.6 lakh cattle and 29.8 lakh buffaloes. It's contribution to total milk production in 2019-20 is 903.6 crore kgs and per capita availability of milk is 344 gms/day, which contributes to rank Karnataka at 11th place in milk production at national level (Livestock census, 2019-2020). In addition to assuring food security for millions of rural households, lowering rural poverty and inequality, and boosting economic growth, especially for those living in rural areas, the dairy industry is self-sufficient. The livelihood of almost 70 million households depends on the dairy industry.

1.1 Livelihood

The oxford dictionary defines livelihood as 'a means of living'. The definition distinguishes it from a simple synonym for income since it emphasises the process of obtaining a livelihood rather than the end result in terms of income or consumption. According to Ellis (2000) [2], livelihood is defined as 'the activities, assets, and access that together determine the living gained by a person or household'. A sufficient stock and flow of food and currency with a person or a family to fulfil their fundamental requirements is described as livelihood.

1.2 Livelihood security

Livelihood security entails safe ownership of, access to, and income-generating activities, including reserves and assets, to manage risks, lessen shocks, and be ready for the unforeseen. According to (Frankenberger, 1996), "adequate and sustainable access to income and resources to meet basic needs" is the definition of livelihood security.

1.3 Aspirational districts

India is still a developing country, it is quickly progressing in human development index. In this regard in 2018, the Government, of India under the NITI Aayog launched the Aspirational Districts Programme (ADP), which selected the underdeveloped districts based on 49 key performance metrics spread over five thematic areas: education, health and nutrition, financial inclusion and skill development, agriculture and water resources, and basic infrastructure. The program's broad objectives include collaboration, convergence and competition between districts, which are accomplished by monthly delta rankings. ADP aims to improve the living standards of resource poor, farm families and achieve long-term goals by integrating central and state development programmes and schemes, as well as an improved farming method in the identified 117 districts quickly and effectively. Additionally, districts are encouraged to develop and share best practises that support advancement across socio-economic themes. Another purpose of the programme is to look at the progress of the blocks in each district. Raichur and Yadgir, districts are identified as Aspirational Districts in Karnataka state. (GoI, Niti Aayog, 2018)^[4].

2. Methodology

The Aspirational districts of the state of Karnataka were the location of the current study. The Raichur, Bellary and Koppal Co-operative Milk Producers Societies Union Ltd., which is responsible for the Raichur area, purchases 1.50 lakh kgs of milk on average every day (rbkmul.org). The Kalaburgi-Bidar and Yadgir Co-operative Milk Producer's Societies Union Limited, which includes Yadgir, purchases 0.48 lakh kg of milk every day on average (kmfnandini.coop). The Cattle breeds found in these regions are Deoni, Khillari, Javari and buffalo breeds are Dharwadi and Murrah.

Sampling plan

Two blocks from each district were selected randomly, i.e. Raichur and Sindhanur blocks of Raichur; A total of 50 respondents from each block were chosen at random; 25 of those were dairy farmers, while the remaining 25 were not. So, 200 respondents in total from two districts were chosen for the study (Fig. 3.1). It is typical in social research to list all of the particular variables that were utilized, along with the theories behind them and the methods used to measure them. A thorough review of the literature and professional input helped us pinpoint the pertinent parameters for our investigation.

Livelihood security index

The Livelihood Security Index (LSI) was created to explore the state of farmer's livelihood through dairy farming in aspirational districts of Karnataka. This implies that the livelihood security of the respondents who were practicing dairy farming i.e., dairy farmers were compared with the

farmers who do not practicing dairying i.e., non-dairy farmers; as a result, we can better examine the significance of dairy farming in securing livelihood of the respondents in the study area.

Development of livelihood security index

a) Selection of dimensions

The concept of livelihood security is multifaceted. By consulting several literatures on the "Livelihood security index", a comprehensive list of seven components was compiled. The following indicators of livelihood security were chosen for this research:

1. Food and Nutritional security
2. Economic security
3. Health security
4. Educational security
5. Social security
6. Institutional security
7. Infrastructural security

(b) Determination of scale values

The scale values were determined using the Normalized Rank Order Method, as given by Guilford (1954)^[5].

$$p = \frac{[(R_i - 0.5) * 100]}{n}$$

Where

R_i = stands for the rank value of the dimension i in the reverse order as 7 to 1 and

n = indicates the number of dimensions ranked by the judges.

(c) Relevancy test

The Relevancy Weightage (RW) and Mean Relevancy Score (MRS) were worked out for all the selected indicators individually by using the following formula,

$$\text{Relevancy Weightage (RW)} = \frac{f_{xi*3} + f_{xii*2} + f_{xiii*1}}{f_{x*3}}$$

Where,

f_{xi} = Number of More Relevant response

f_{xii} = Number of Relevant response

f_{xiii} = Number of Least Relevant response

f_x = Total number of Judges

f_{x*3} = Maximum possible score

$$\text{Mean Relevancy Score (MRS)} = \frac{f_{xi*3} + f_{xii*2} + f_{xiii*1}}{F_x}$$

Where,

f_{xi} = Number of more relevant response

f_{xii} = Number of Relevant response

f_{xiii} = Number of Least relevant response

f_x = Total number of Judges

(d) Compilation of the composite index

As each LSI dimension has a different number of indicators, the range of total scores for each dimension varied. In order to transform the overall score for each dimension into a unit score, the following simple range and variance were used:

$$U_{ij} = \frac{Y_{ij} - \text{Min } Y_{ij}}{\text{Max } Y_j - \text{Min } Y_j}$$

Where,

U_{ij} = Unit score of the i^{th} respondents on j^{th} dimension

Y_{ij} = Value of the i^{th} respondent on the j^{th} dimension

Max Y_j = Maximum score on the j^{th} dimension

Min Y_j = Minimum score on the j^{th} dimension

Thus, the score obtained was divided by the sum of scale values in order to get the LSI for each respondent.

$$LSI_i = \frac{\sum U_{ij} * S_j}{\text{Sum of scale values}}$$

Where

LSI_i = Livelihood Security Index of i^{th} respondent

U_{ij} = Unit score of the i^{th} respondent on j^{th} component

S_j = Scale value of the j^{th} component

\sum = Sum

Propensity score matching (PSM) technique

Propensity Score Matching constructs a statistical comparison group between dairy (treatment) and non-dairy farmers (control), which means participants should belong to same socio economic status.

3. Results and Discussion

3.1 Livestock Possession

Among dairy producers, more than half (57.00%) had a medium level of livestock ownership (4-6 animals), compared to 26.00% who had a low level (less than three) and 17.00% who had a high level (more than seven) of cattle.

3.2 Livelihood security of dairy and non-dairy farmers

Comparative study was conducted between two groups of farmers i.e. dairy and non-dairy farmers in the study region to determine the function of dairy farming in obtaining livelihood security by the respondents. The farmers who possessed at least one milch cattle at the time of investigation were considered as a dairy farmer while the other group who do not possess any milch cattle were categorised as a non-dairy farmer. Then the indicator values and the composite index value have been compared between the dairy and non-dairy farmers.

Using the Propensity Score Matching (PSM) method, it was found that dairy farmers' livelihood security was 14.10% higher than that of non-dairy farmers.

From the figure it is evident that the background characteristics of both dairy and non-dairy farmers overlapped each other and it reveals that the livelihood of both respondents can be statistically comparable with respect to their characteristics.

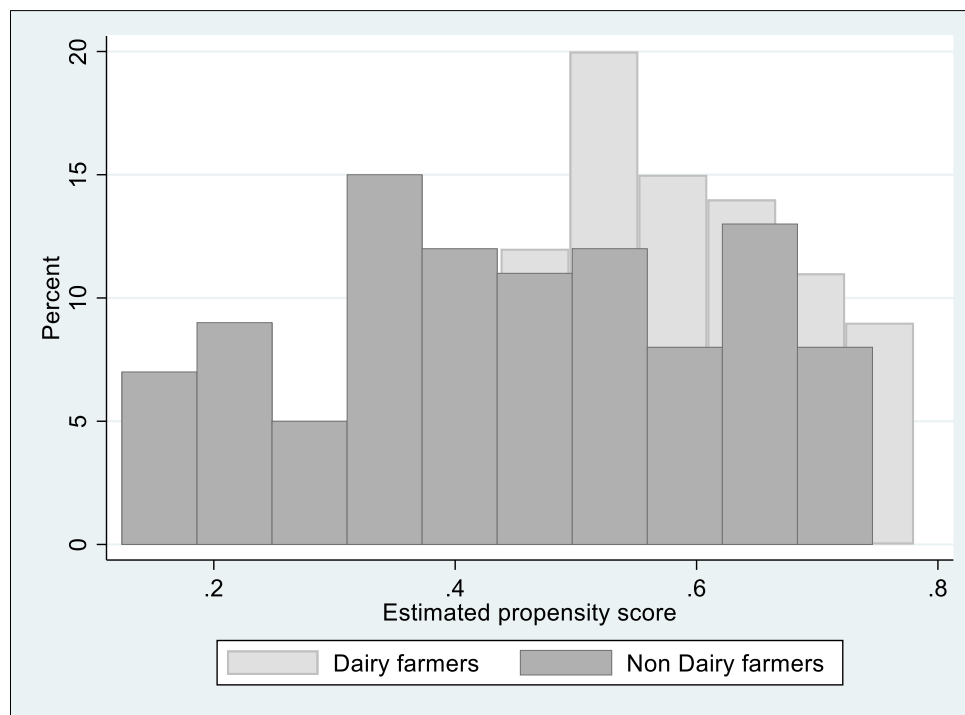


Fig 1: Graph showing the frequency distribution of propensity score of dairy and non-dairy farmer

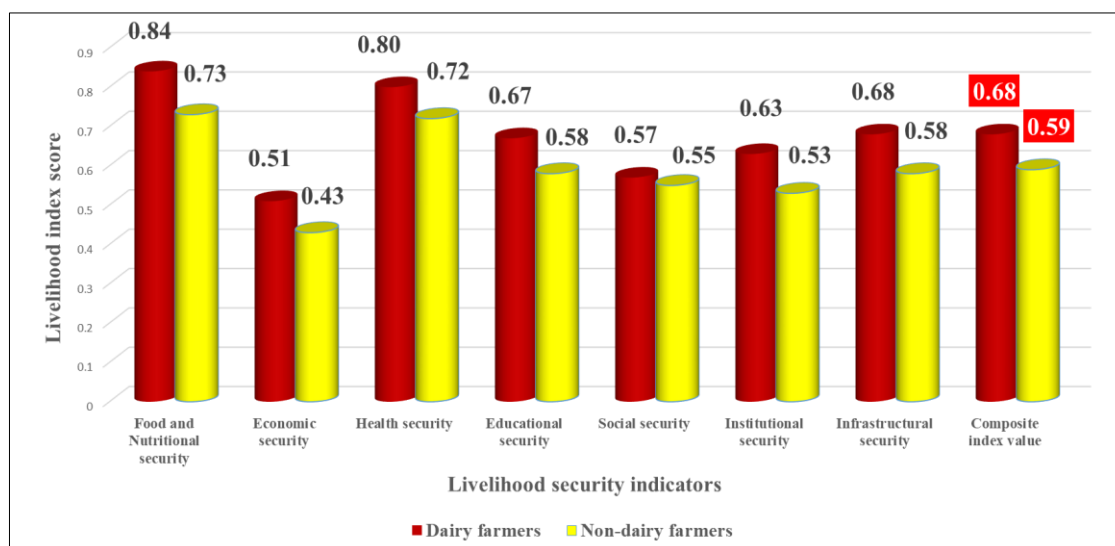
3.3 Livelihood security index of different indicators

The overall composite livelihood index of dairy farmers was found to be 0.68 and for non-dairy farmers it was 0.59. In the case of dairy producers, the category 'Food and nutritional security' was found to have the highest average index value, at around 0.84. Followed by 'Health security' (0.80), 'Infrastructural security' (0.68), 'Educational security' (0.67), 'Institutional security' (0.63), 'Social security' (0.57) and 'Economic security' at last with a composite index value 0.51.

In the case of non-dairy farmers 'Food and nutritional security' got the highest average index value of 0.73. Followed by 'Health security' (0.72), 'Educational security' (0.58), 'Infrastructural security' (0.58), 'Social security' (0.55), 'Institutional security' (0.53) and 'Economic security' (0.43). In comparison with above data it could be observed that both dairy farmers and non-dairy farmers had better 'Food and nutritional security' and low 'economic security'. The detailed comparison is listed below in separate indicators.

Table 1: Composite Livelihood Security Index values of Dairy and Non-dairy farmers

Indicators	Index value		$\chi^2 - p$ value
	Dairy farmers	Non-dairy farmers	
Food and Nutritional security	0.84	0.73	0.001
Economic security	0.51	0.43	0.045
Health security	0.80	0.72	0.014
Educational security	0.67	0.58	0.005
Social security	0.57	0.55	0.156
Institutional security	0.63	0.53	0.004
Infrastructural security	0.68	0.58	0.020
Composite index value	0.68	0.59	

**Fig 2:** Distribution of the respondents according to their livelihood index score

3.4 Overall livelihood security index

52.00 percent of dairy farmers had a medium level of livelihood security from their farming, whereas 39.00 percent and 9.00 percent of dairy farmers, respectively, had high and poor levels. While among non-dairy farmers, low degree of livelihood security was the case for 47% of them, followed by medium level (41%) and high level (12%) of livelihood security.

Dairy farming has a significant role in enhancing the food and nutritional security of rural households by providing them with year-round income and employment, which also improves economic security. As a result, dairy farmers have greater livelihood security than non-dairy farmers. Whereas in the case of non-dairy farmers, agriculture is primarily dependent on erratic climatic factors, production risks, and marketing risks as a result of which the farmers were left with low income from agriculture, were unable to meet their household's essential needs, and had a poor level of overall livelihood security. Results are comparable with (Shivangavva, 2022) [9].

4. Conclusion

In the light of the above findings, it may be concluded that, 'livelihood security' of the dairy farmers was observed to be significantly higher than the non-dairy farmers by 14.10 per cent in Aspirational districts of Karnataka State. The overall livelihood security index for the dairy farmers was at 0.68 in case of non-dairy farmers it was 0.59. Even though dairy farmers secure a better livelihood in every aspect, still there are some needs to be taken to ameliorate the dairying sector in the study area. The medium level of experience in dairy

farming reveals that there is a need to improve the knowledge domain among the existing cattle management practices. Livelihood security of dairy farmers was found to be better secured than non-dairy farmers in the Aspirational districts of Karnataka state. Hence, strengthening dairy based developmental programmes can be one of the important interventions for securing the livelihood of farmers in Aspirational districts of our country.

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