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COMPARATIVE ANALYSIS OF LIVELIHOOD SECURITY OF THE FARMERS PRACTICING DIFFERENT FARMING SYSTEMS IN MANDYA DISTRICT OF KARNATAKA

Shwetha, N.V.¹, Sharad Sachan^{1*} and Y. N. Shivalingaiah²

¹School of Agriculture, Lovely Professional University, Punjab, India

²Department of Agricultural Extension, University of Agricultural Sciences, Bangalore, Karnataka, India

*E-mail: shwethanv.26050@lpu.co.in

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ABSTRACT

The survey was conducted during 2018-19 in Mandya district of Karnataka to analyse the livelihood security of the farmers practicing divergent farming systems. From Mandya district two taluks were considered i.e., K.R.Pete and Pandavapura. Major farming systems in each taluk were identified after thorough discussion with extension professionals of line departments and interaction with farmers and two predominant farming systems were selected from each taluk i.e., 'paddy+dairy' and 'paddy+dairy+horticulture' farming systems from K.R.Pete taluk and 'sugarcane+dairy' and 'sugarcane+dairy+horticulture' farming systems from Pandavapura taluk. For each farming system 30 respondents were selected, hence the total respondents selected was 120. A comprehensive scale was developed to measure livelihood security of the respondents adopting divergent farming systems. The study revealed that, under 'paddy+dairy' farming system, more than half (66.66 %) of the farmers fall under poor level of livelihood security. In 'paddy+dairy+horticulture' farming system more than two fifth (43.33 %) of the respondents fall under average extent of livelihood security. In case of 'sugarcane+dairy' farming system, 40.00 % of the respondents fall under to poor extent of livelihood security. In case of 'sugarcane+dairy+horticulture' farming system, more than half (53.33 %) of the farmers belonged to average level of livelihood security. Furthermore, the results also showed that, there is a symbolic difference between livelihood security of farmers practicing 'paddy+dairy' and 'paddy+dairy+horticulture' farming systems at 1 per cent level of consequence. The U (6.00) value indicated that, there is a symbolic difference between livelihood security of farmers practicing 'sugarcane+dairy' and 'sugarcane+dairy+horticulture' at 1 per cent level of significance. The Chi-square value (24.40) indicates there is a symbolic difference between livelihood security of the farmers practicing 'paddy + dairy', 'paddy + dairy + horticulture', 'sugarcane + dairy' and 'sugarcane + dairy + horticulture'. It was noticed that 'sugarcane + dairy + horticulture' practicing farmers have better livelihood security than other farmers in Mandya district.

Keywords: Livelihood security, farming system, Mann-Whitney U test, Kruskal Wallis test

INTRODUCTION

The agricultural sector is the backbone of Indian economy contributing majorly to the country's Gross Domestic Product (GDP). As on February 2018, it was estimated that over 58 per cent of rural Indians depend on farming for their livelihood and this sector contributes around 17 to 18 per cent to the country's GDP. In India the major source of livelihood is agriculture, hence, agricultural development has received the most important priority in the programmes of planned change and generate higher income and also create adequate employment opportunities for rural people by maximizing the productivity not only in the field of agriculture but also in the field of off farm and other allied enterprises with special importance on animal husbandry, poultry, small scale agro-industries and handicrafts through proper identification and development of indigenous knowledge and traditional skills. A framing system consists of different components which depend on each other. A system is defined as a set of components that are inter-related and interacting among themselves. Hence, system approach is applied to the field of agriculture for efficient utilization of all available resources with the rural mass and to maintain sustainability in production and getting higher net returns. Livelihood is the methods for

individuals use to help themselves, to endure and to thrive. Livelihood is an outcome of why and how people organize to transform the environment to fulfil their needs through technology, labour, power, knowledge and social relations. Livelihoods are also shaped by the more extensive financial and political frameworks inside which they operate. Livelihood is additionally about making and grasping new opportunities. The gradual decline in farm land holding has become more difficult to produce required food and other agricultural products for the family. The situation is continued to weaken due to repeated failure of monsoons on one side and on the other side, due to increasing population and decrease in per capita availability of land. Further, there is no scope for horizontal expansion of land and only vertical expansion is possible by integrating various farm components (Behera *et al.*, 2001).

In this scenario, an attempt was made to analyses the level of livelihood security of the respondents under different farming systems and to assess under which farming system the livelihood security was better in selected area. With this direction, the study was under taken with the following objectives.

1. To analyse the livelihood security of the farmers

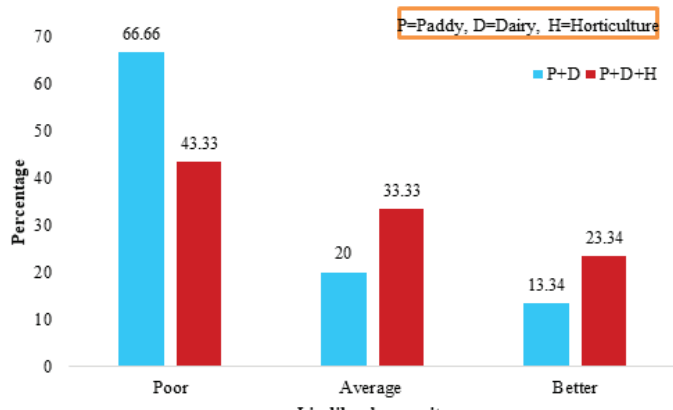


Fig. 1: Livelihood security of farmers practicing paddy+dairy and paddy+dairy+horticulture

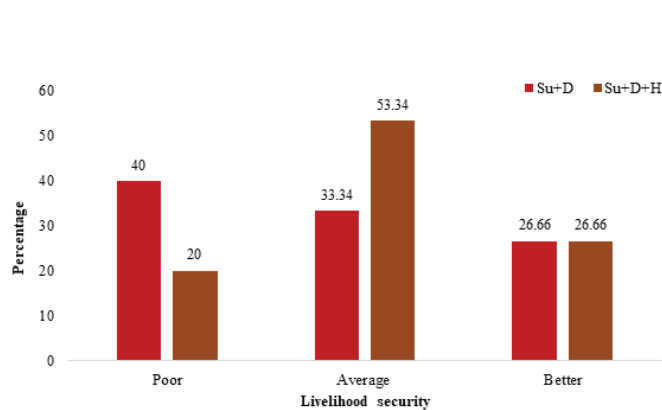


Fig. 2: Livelihood security of farmers practicing sugarcane+dairy and sugarcane+dairy+horticulture farming system

Table 1: Classification of the farmers based on livelihood security level under paddy based farming system in K.R.Pete taluk

Sl. No.	Farming system	Livelihood security level	Frequency	Percentage
1	Paddy+Dairy Mean=73.66 SD=24.27 (n1=30)	Poor (<61.52 score)	20	66.66
		Average (61.52-85.80 score)	06	20.00
		Better (>85.80 score)	04	13.34
2	Paddy +Dairy +Horticulture Mean=134.26 SD=16.11 (n6=30)	Poor (<126.20 score)	20	66.66
		Average (126.20-142.32 score)	06	20.00
		Better (>142.32 score)	04	13.34

Table 2: Classification of the farmers based on livelihood security level under Sugarcane based farming system in Pandavpura taluk

Sl. No.	Farming system	Livelihood security level	Frequency	Percentage
1	Sugarcane+Dairy Mean=86.53 SD=18.37 (n3=30)	Poor (<77.34 score)	12	40.00
		Average (77.34-95.72 score)	10	33.34
		Better (>95.72 score)	08	26.66
2	Sugarcane+Dairy +Horticulture Mean=155.43 SD=18.49 (n4=30)	Poor (<146.20 score)	06	20.00
		Average (146.20-164.65 score)	16	53.34
		Better (>164.65 score)	08	26.66

Table 3: Comparison between livelihood security of the farmers practicing ‘paddy+dairy’ and ‘paddy+dairy+horticulture’ farming systems in K.R.Pete taluk

Sl. No.	Farming system	N	Frequency	Percentage
			Mean rank	Sum of ranks
1	Paddy + Dairy	n1=30	16.78	503.50
2	Paddy+Dairy+Horticulture	n2=30	44.22	1326.50
Mann-Whitney U			38.500**	

**Significant at 1 per cent level

Table 4: Comparison between livelihood security of the farmers practicing ‘sugarcane+dairy’ and ‘sugarcane+dairy+horticulture’ farming systems in Pandavara taluk

Sl. No.	Farming system	N	Frequency	Percentage
			Mean rank	Sum of ranks
1	Sugarcane+Dairy	n3=30	15.21	441.00
2	Sugarcane+Dairy+Horticulture	n4=30	49.80	1489.00
Mann-Whitney U			6.00**	

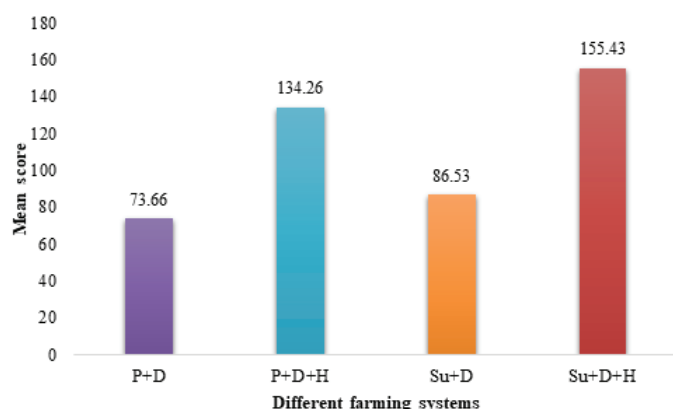
**Significant at 1 per cent level

Table 5: Comparison between livelihood security of the farmers practicing different farming systems in Mandya district

Sl. No.	Farming system	N	Mean score	Chi-square value
1	Paddy+Dairy	n1=30	73.66	24.40**
2	Paddy+Dairy+Horticulture	n2=30	134.26	
3	Sugarcane+Dairy	n3=30	86.53	
4	Sugarcane+Dairy+Horticulture	n4=30	155.43	

Table 6: Dimension wise level of livelihood security of the farmers practicing different farming systems in Mandya district

Sl.No.	Dimensions	Scores	Percentage of scores	Rank
A.	Paddy + dairy farming system (n1=30)			
1	Food and nutritional security	92	61.33	II
2	Economic security	85	56.00	V
3	Ecological security	91	60.66	III
4	Social security	95	63.33	I
5	Psychological security	88	58.66	IV
6	Physical security	84	56.00	VI
B.	Paddy +dairy+horticulture farming system (n2=30)			
1	Food and nutritional security	103	68.66	II
2	Economic security	101	67.33	III
3	Ecological security	105	70.00	I
4	Social security	99	66.00	IV
5	Psychological security	96	64.00	V
6	Physical security	88	58.66	VI
C.	Sugarcane +Dairy farming system (n3=30)			
1	Food and nutritional security	92	61.33	VI
2	Economic security	101	67.33	III
3	Ecological security	110	73.33	I
4	Social security	105	70.00	II
5	Psychological security	98	65.33	IV
6	Physical security	95	63.33	V
D.	Sugarcane+Dairy farming system (n4=30)			
1	Food and nutritional security	105	70.00	III
2	Economic security	112	74.66	II
3	Ecological security	98	65.33	IV
4	Social security	115	76.66	I
5	Psychological security	95	63.33	V
6	Physical security	92	61.33	VI

**Fig. 3:** Comparison between levels of livelihood security among farmers under different farming systems in Mandya district

practicing different farming systems in Mandya district.

2. To compare the livelihood security of the farmers practicing different farming systems in Mandya district.

MATERIALS AND METHODS

The investigation was conducted by using ex-post facto research design in Mandya district of Karnataka. The Mandya district was selected because of existence of diversified farming systems. From Mandya two taluks having different agro ecological situation was considered. From each taluk, six villages were selected. From each village, 10 respondents were selected. Hence, the total respondents were 120 respondents. 'Paddy based farming system' and 'Sugarcane based farming systems' were

purposefully selected from K. R. Pete and Pandavapura taluks of Mandya district respectively. By considering available secondary data and in discussion with line department officials and other local leaders major farming systems in each taluk were identified and two- predominant farming systems were selected from each taluk *i.e.*, 'paddy+dairy', 'paddy+dairy+horticulture' farming systems from K. R. Pete taluk and 'sugarcane+dairy', 'sugarcane+dairy+horticulture' farming systems from Pandavapura taluk. These are the predominant farming systems in selected taluks. The present research was carried out in order to know which combination of farming system was viable and which farming system contributing more towards farmers' livelihood security. The following independent variables like age, education, family size, farming experience, land holding, irrigation potential, cropping intensity, innovative proneness, risk orientation, achievement motivation, management orientation, scientific orientation, deferred gratification, decision making ability, mass media exposure, extension participation, economic motivation and information seeking behaviour were taken for the study to know their relationship and their contribution to livelihood security.

In order to measure the livelihood security of the respondent adopting divergent farming systems, a comprehensive scale was developed based on the interaction with experts. The livelihood security scale consists of 39 statements and the responses on extent of livelihood security were obtained on a five point continuum representing 'very greater extent', 'greater extent', 'moderate extent', 'least extent' and 'very least extent' assigning a weightage of 5,4,3,2, and 1 respectively for positive statements and the scoring was overturned for negative statements (Chaudhari *et al.*, 2007). The livelihood security score was calculated by adding up the scores obtained by the respondents on all 39 statements. The livelihood security score of this scale is ranging from a minimum of 39 and maximum of 195. The respondents were given their level of livelihood security for 39 statements included in the scale. Based on their scores, livelihood security level was categorized *i.e.*, poor, average and better. The collected data were scored, tabulated and analysed using frequency, percentage, mean, standard deviation, Mann-Whitney U test, Kruskal Wallies (one way ANNOVA) test.

RESULTS AND DISCUSSION

The outcome from the Table 1 and Fig 1 indicates the livelihood security of the farmers practicing paddy based farming system. In case of 'paddy+dairy' practicing farmers, more than three fifth (66.66 %) of the farmers belonged to poor level of livelihood security, which is followed by 20.00 per cent and 13.34 per cent of the farmers selected were belonged to average and better level of livelihood security respectively. This may be due to the reason that the farmers are growing only paddy in command area because the land which is not suitable for cultivating other crops except sugarcane and paddy

because of excess water. Further, farmers are also not obtaining remunerative prices for the paddy. Most of the farmers of study area rearing local breeds of cow which are giving low milk yield leads to low income and poor livelihood security.

The outcome from the Table 1 with respect to 'paddy+dairy+horticulture' farming system, more than two fifth (43.33 %) of the farmers fall under average level of livelihood security, followed by 33.33 per cent and 23.34 per cent of the farmers fall under to poor and better level of livelihood security respectively. The reason might be that the farmers along with paddy, they are cultivating horticultural crops like tomato, carrot, pumpkin etc. particularly in tail end which will contribute additional income and employment to the farmers. Hence, most of the farmers under 'paddy+dairy+horticulture' are belonged to average level of livelihood security compared to poor level of livelihood security under 'paddy+dairy' farming system.

Farmers practicing 'paddy+dairy+horticulture' have better mean score (134.26) compared to farmers practicing 'paddy+dairy' (73.66) farming system. The probable reason may be that diversification of farm with cultivating horticultural crops like tomato, banana, pumpkin, coconut etc. and dairy enterprise. Hence, farmers are getting more income and continued employment which results in better livelihood security compared to 'paddy+dairy'. Dairy enterprise is considered as the complimentary and supplementary enterprise which ensures income and employment and improves soil fertility that leads to livelihood security. The results are in line with the study done by Ponnuswamy *et al.*, (2015).

An examination of Table 2 and Fig 2 revealed that, in case of 'sugarcane+dairy' farming system, two fifth (40.00 %) of the farmers fall under poor level of livelihood security, which is followed by 33.34 percent and 26.66 percent of the farmers belonged to average and better level of livelihood security respectively. Since, sugarcane is an annual crop where farmers are not getting regular income and employment and have to wait for 18 to 20 months to get income. Further, the minimum support price providing by government is not remunerative for sugarcane growers. The delayed harvesting results in reduced sugar/TSS content lead to low yield and income this might be the reasons for poor level of livelihood security.

In case of 'sugarcane+dairy+horticulture' farming system, more than half (53.34 %) of the respondents fall under average level of livelihood security, followed by 26.66 per cent and 20.00 per cent of the respondents belonged to better and poor level of livelihood security respectively. This might be due to decrease in availability of irrigation water for farmers of Pandavapura, they started cultivating horticultural crops like tomato, carrot, beans etc. which enable them to get regular income and employment. The farmers are practicing dairy as one of the component in their farm, which is also contributing towards farmer's

livelihood security. Combination of these components may be the reason for average and better level of livelihood security.

Farmers practicing 'sugarcane + dairy + horticulture' have better mean score (155.43) compared to farmers practicing 'sugarcane + dairy' (86.53). The probable reason may be that diversification of farm with cultivating horticultural crops like tomato, banana, pumpkin, beans, carrot etc., farmers are getting more and constant income and assured employment all round the year results in better livelihood security compared to 'sugarcane + dairy'. The outcomes are in line with the study reported by Ponnu swamy *et al.*, (2015), Mamatha Lakshmi (2013), Suresh, *et al.*, (2008).

The Mann-Whitney U test was applied to compare the livelihood security of farmers under 'paddy + dairy' and 'paddy + dairy + horticulture' farming systems which is depicted in Table 3. The results shows that there is positive and significant difference between livelihood security of farmers practicing 'paddy + dairy' and 'paddy + dairy + horticulture' farming systems at one per cent level in K. R. Pete taluk. The mean rank of farmers practicing 'paddy + dairy+ horticulture' was 44.22 as against to 'paddy + dairy' (16.78). The farmers who are practicing 'paddy + dairy + horticulture' have better livelihood security than the farmers practicing 'paddy+ dairy'. This may be due to reason that along with paddy and dairy, the farmers are cultivating horticultural crops that generate additional income and employment to the family members all round the year which leads to better livelihood status.

The results of the Mann-Whitney U test from the Table 4 explains there is a positive significant difference between livelihood security of farmers practicing 'sugarcane + dairy' and 'sugarcane + dairy + horticulture' farming systems at one per cent level in Pandavapura taluk. The mean rank of farmers practicing 'sugarcane + dairy + horticulture' is high (49.80) as compared to 'sugarcane + dairy' (15.21). The farmers who are practicing 'sugarcane + dairy + horticulture' have better livelihood security than the farmers practicing 'sugarcane+ dairy'. The possible reason may be that since the irrigation water availability in Pandavapura taluk was decreased over the years and farmers came to know the advantage of practicing horticulture in their farm along with sugarcane and dairy. Cultivating horticultural crops that results in generating extra income and employment to the family members. Diversification and intensification of farm with cultivating horticultural crops minimizes the risk in the study area. The outcomes are in line with the study reported by Yashodhara (2015).

The Kruskal- Wallies one way ANOVA was used to test the significant difference between livelihood security of the respondents adopting different farming systems in Mandy district which is depicted in the Table 5 and Fig 3. The test was tuned out to a positive and significant difference among different farming systems *viz.* 'paddy + dairy', 'paddy + dairy + horticulture', 'sugarcane + dairy' and 'sugarcane + dairy + horticulture' at one per cent level.

The data revealed that mean score of 'sugarcane + dairy + horticulture' farming system was more (155.43) followed by 'paddy + dairy + horticulture' (134.26), 'sugarcane + dairy' (86.53) and 'paddy + dairy' (73.66). The reason might be that, the 'sugarcane + dairy + horticulture' fetches higher and assured income and employment generation to farmers throughout the year. Further, it leads to consumption of nutritious food items, establishing social linkages, recognition in the society, purchasing land, constructing own houses, sending children to higher education, leadership development and confidence building. These are the other reasons for better livelihood security among 'sugarcane + dairy + horticulture' and 'paddy+dairy+horticulture' farming system. Lowest mean score with respect to 'paddy + dairy' and 'sugarcane+dairy' farming system may be due to high cost of production, poor price for the produce, low yield due to incidence of pest and diseases and resource constraints.

Dimension-wise analysis of livelihood security of farmers under different farming systems in Mandya district was done and results are depicted in Table 6.

The results from the Table 6 indicates that, in case of 'paddy + dairy' farming system social security (63.33 %, rank I), food and nutritional security (61.33 %, rank II), ecological security (60.66 %, rank III) and psychological security (58.66 %, rank IV) were the major dimensions of livelihood security. Where as in case of 'paddy + dairy + horticulture' farming system ecological security (70.00 %, rank I), food and nutritional security (68.66 %, rank II), economic security (67.33 %, rank III) and social security (66.00 %, rank IV) were the important dimensions of livelihood security. The probable reason for the above findings that since paddy is the staple food of the farmers. Hence, the food and nutritional security fetches first rank under paddy-based farming system.

In case of 'sugarcane +dairy' farming system, ecological security (73.3 %, rank I), social security (70.00 %, rank II), economic security (67.33 %, rank III) and psychological security (65.33 %, rank IV) were the important dimension of livelihood security. Likewise in case of 'sugarcane + dairy + horticulture' farming system, social security (76.66 %, rank I), economic security (74.66 %, rank II), food and nutritional security (70.00 %, rank III) and ecological security (65.33 %, rank IV) were the important dimensions of livelihood security. The findings are in accordance with the study reported by Kowshalya (2016).

The probable reason for the above findings might be that diversification of farming improves water use efficiency, promote recycling of farming waste, reduces vulnerability to adverse climatic conditions etc. Further, farmers adopting 'paddy + dairy' and 'paddy + dairy + horticulture' farming system the food may be available throughout the year, hence their food and nutritional security is good. Further, combination of different enterprises results in assured income and improved economic condition leads to recognition to farmers in society and ensures employment

to family members round the year. Construction of new house, purchase of equipment's etc. which lead to physical security. Practicing diversified farming systems helps in improving farmers' knowledge by participating different extension programmes organized by line departments which give confidence to try new ideas in farming and it gives higher satisfaction for the farmers.

CONCLUSION

The different farming systems practiced by farmers have provided effective recycling of produce of one component as input to the other component. The study indicated that the farmers under 'paddy + dairy' and 'paddy + dairy + horticulture' farming systems had poor level of livelihood security due to lack of remunerative price for paddy. Hence, it is necessary to provide minimum support price for paddy, provide technical guidance and conduct training programmes to motivate farmers to take up diversification in farm and to adopt scientific methods so that they can sustain their income and livelihood security. The farmers practicing 'sugarcane + dairy' farming system had poor livelihood security as compared to 'sugarcane + dairy + horticulture' farming system, where farmers had average livelihood security. So, 'sugarcane + dairy + horticulture' farming system need to be popularized by providing assured market for horticultural produce and providing minimum support price for sugarcane. It also provided flow of cash to the farmers round the year by way of disposal of milk, vegetables and sugarcane. The 'sugarcane + dairy + horticulture' farming system has contributed higher proportion to the total income in the existing farming systems.

REFERENCES

- Behera, U. K., Jha, K. P and Mahapatra, I. C., 2001. Generation of income and employment – A success story, *Intensive Agriculture*, 39(7-8): 9-14.
- Chaudhari, R. R., Hirevenkanagoudar, L. V., Hanchinal, S.N., Mokashi, A. N., Katharki, P. A. and Banakar. B., 2007, A scale for measurement of entrepreneurial behaviour of dairy farmers. *Karnataka J. Agric. Sci.*, 20(4): 792-796.
- Kowshalya, K.S., 2016, Impact of Integrated Farming System Demonstration (IFSD) programme on livelihood and nutritional security of farmers of Mandya district. *Ph.D. (Agri.) Thesis (Unpub.)*, Univ. Agric. Sci., Bangalore.
- Mamathalakshmi, N., 2013, An analysis of livelihood security among agricultural labourers in Karnataka. *Ph.D. (Agri.) Thesis (Unpub.)*, Univ. Agric. Sci., Bangalore.
- Ponnuswamy, K., Shukla, A. K. and Kundan Kishore, 2015, Studies on sustainable livelihood of farmers in horticultural based farming system. *Indian J. Hort.*, 72(2): 285-288.
- Suresh, A., Gupta, D. C. and Mann J.S., 2008, Returns and economic efficiency of sheep farming in semi-arid regions: A study in Rajasthan. *Agric. Econ. Res. Review*, 21(2): 227-234.
- Yashodhara, B., 2015, A Comparative analysis of livelihood status in irrigated and rainfed farming situations in central dry zone of Karnataka. *PhD. (Agri.) Thesis (Unpub.)*, Univ. Agric. Sci., Bangalore.