Original Research Article

Relative Economics of Farmers Practicing Different Farming Systems and their impact on livelihood security in Chikkaballapur district of Karnataka

Abstract

The study was undertaken in Mandya district of Karnataka state to assess the livelihood security of farmers practicing different farming systems and their relative economics. From Mandya district two taluks were selected *i.e.*, Pandapura and K.R.Pete. 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 randomly, constituting the total sample size of 120. A comprehensive scale was developed to measure livelihood security of the farmers practicing different farming systems. The six dimensions were identified under livelihood security namely food and nutritional security, economic, ecological, social, psychological and physical security to assess the farmers livelihood security practicing different farming systems. In case of 'paddy + dairy' farming system social security (63.33%), in case of 'paddy + dairy + horticulture' farming system ecological security (70.00%), in case of 'sugarcane + dairy' farming system economic security (73.33%) and in case of 'sugarcane + dairy + horticulture' farming system social security (76.66%), was ranked I. The highest benefit cost ratio was observed or found in case of 'sugarcane+dairy+horticulture' (1:2.62) followed by 'Sugarcane+dairy' (1:2.47), 'sugarcane+dairy+horticulture' (1:2.3) and 'paddy+dairy' (1:1.43).

Comment [D1]: Add your recommendation

Keywords: Farming system, livelihood security, correlation, path analysis, and benefit cost ratio

Introduction

Indian agriculture is known for its multi-functionalities of providing employment, livelihood, food, nutrient and ecological securities. Indian agriculture employs 58 per cent of the total work force and it is the major source of poverty alleviation, empowerment of the

agrarian folk and it is the corner stone of development for India. As a result of sustained efforts food grain production has increased from 50.8 million tons in 1950-51 to 241.56 million tons in 2010-2011 (Harish, 2012).

Traditional farming system used by farmers in India are based on centuries of experiences characterized by mixed farming involving crop production with one or more enterprises like dairy, poultry, sericulture, piggery, sheep, goat, fisheries and bee-keeping. Their main aims were to achieve stability of production, provide subsistence for the family and guard against weather aberration and other environmental stresses.

In recent times it is advocated that farming system that are ecologically, biologically and socio-economically sound not only involve crop production but are also dependent upon their integration with other enterprises like animal production, horticulture and vegetable production etc. At its origin the farming system concept takes care of most important components like soil, water, crops, livestock, labour etc. while assessing the need of farming system approach in Indian context, Swaminathan (1990) described that having attained food security for the nation; the future strategy would necessitate a change in priorities through diversification to encompass farm level horticulture, agro-forestry, animal production and fisheries into the subsistence level-farming avocation. To sustain the natural resources and farm income and also to meet the diversified demand for food, fodder and fuel of increasing population, the adoption of appropriate farming system which suits to the farmers resources are of at most importance.

In India, where majority (78%) of the farming community belongs to small and marginal farmers having only 32.5 per cent of the total operational area, specialized farming may not be viable and sustainable in the long run. The average size of the farm in India has been declining and over 80 million out of 105 million operational holdings are below the size of 1.0 ha.(Mahapatra and Bapat, 1992) and poses a serious problem in general in India and in Karnataka in particular. The farmers particularly those belonging to small and marginal category are unable to meet both the ends with the income from cropping alone. With gradual decline in farm size, it has become increasingly difficult to produce enough food and other farm produces for the family. The situation is further weakened due to repeated failure of monsoons on one side and on the other side, due to ever increasing population and decline in per capita availability of land. Further, there is hardly any scope for horizontal expansion of land and only vertical expansion is possible by integrating various farm enterprises (Behera *et al* 2001).

Livelihood is the means for people use to support themselves, to survive and to prosper. It is an outcome of how and why people organize to transform the environment to meet their needs through technology, labour, power, knowledge, and social relations.

Livelihoods are also shaped by the broader economic and political systems within which they operate. In general, almost half of the world's population does not have the socio-economic and political means to realize their economic and social rights. One of the major causes of the poverty is the lack of viable livelihoods in the developing world (Mamathalakshmi, 2013). In this scenario, an attempt was made to analyse the livelihood security of farmers under different farming systems and to assess under which farming system the livelihood security was better in selected area. The present study was undertaken with following objectives:

1. To estimate the relative economics of the farmers under major farming systems.
2. To analyse dimension wise livelihood security of farmers practicing different farming systems.

Materials and Methods

The present investigation was undertaken in Mandya district of Karnataka during the year 2018-19. These districts were purposively selected due to existence of diversified farming systems that's meant for making comparison. From Mandya district two taluks were selected *i.e*., Pandapura and K.R.Pete. 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.

The ten respondents practicing different farming systems were randomly selected from each village. Hence, the total farmers from 12 villages was 120 ("paddy+dairy"-30, "paddy+dairy+horticulture"-30, "sugarcane+dairy"-30 and "sugarcane+dairy+horticulture" -30)

Eighteen independent variables namely, age, education, family size, farming experience, land holding, cropping intensity, irrigation potential, innovative proneness, risk orientation, achievement motivation, management orientation, scientific orientation, mass media exposure, deferred gratification, decision making ability, extension participation, economic motivation and information seeking behaviour were selected for the study. The

developed and standardised livelihood security scale was used to quantify the dependent variable (livelihood security). To estimate relative economics the total cost production of each crop, yield obtained per crop, total gross income were considered. Eighteen independent variables selected for the study were quantified by using structured schedule and standardized scale developed by different authors. Personal interview method was followed to collect the data. The data was analysed using mean, standard deviation, correlation and path analysis.

Results and Discussion

The relative economics of major farming systems practiced by farmers in Mandya is presented in Table 1 and table 2. The data in the table 1 revealed that in case of 'paddy+dairy' farming system, average total cost of production was Rs.23,933.00, gross income was Rs. 34,443.00 and net income was Rs. 10,509.70. With respect to 'paddy+dairy+horticulture' farming system net income was Rs. 49,250.00 where total cost of production was Rs. 71,150.00 and gross income was Rs. 1, 20,400.00. The total benefit cost ratio under 'paddy+dairy' farming system was 1.43 where benefit cost for paddy was 1.32 and for dairy it was 2.35. The total benefit cost ratio under 'paddy+dairy+horticulture' farming system was 1.69 where benefit cost for paddy was 1.41 for dairy it was 2.36 and for horticulture it was 1.78.

Table 1:Relative economics of major farming systems practicing by farmers in K.R.Pete taluk of Mandya district

In rupees

Farming systems	Crops	Total cost of production	Gross income	Net income	Benefit cost ratio
P+D (n=30)	Paddy (per acre)	21,333.30	28333.00	6999.7.00	1.32
	Dairy (per cross breed of cow per month)	2600.00	6110.00	3510.00	2.35
	Total	23933.30	34443.00	10509.70	1.43
P+D+H (n=30)	Paddy(per acre)	22400.00	31800.00	9400.00	1.41
	Dairy (per cross breed of cow per month)	2750.00	6500.00	3750.00	2.36
	Horticulture (per acre)	46000.00	82100.00	36100.00	1.78
	Total	71150.00	120400.00	49250.00	1.69

P+D= Paddy+ dairy, P+D+H=Paddy+dairy+horticulture

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Table 2: **Relative economics of major farming systems practicing by farmers in Pandavapura taluk of Mandya district**

In rupees

Farming systems	Crops	Total cost of production	Gross income	Net income	Benefit cost ratio
Su+D (n=30)	Sugarcane (per crop)	27090.91	67000.00	39909.09	2.47
	Dairy (per cross breed of cow per month)	2663.63	6500.00	3836.37	2.44
	Total	29754.54	73500.00	43745.46.00	2.47
Su+D+H (n=30)	Sugarcane (per crop)	29181.82	86000.00	56818.18.00	2.94
	Dairy (per cross breed of cow per month)	2900.00	7650.00	4750.00	2.63
	Horticulture (per acre)	51000.00	124500.00	73500.00	2.44
	Total	83081.82	218150.00	135068.20	2.62

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Su+D=Sugarcane + dairy, Su+D+H= Sugarane+dairy+horticulture

The data in the table 2 revealed that, in case of 'sugarcane+dairy' farming system, average total cost of production was Rs.29,757.54, gross income was Rs. 73,500.00 and net income was Rs. 43,745.46. With respect to 'sugarcane+dairy+horticulture' farming system net income was Rs. 1,35,068.20 where total cost of production was Rs. 83,081.82 and gross income was Rs. 2,18,150. The total benefit cost under 'sugarcane+dairy' farming system was 2.47 where benefit cost for sugarcane was 2.47 and for dairy it was 2.44. The total benefit cost ratio under 'sugarcane+dairy+horticulture' farming system was 2.62 where benefit cost for sugarcane was 2.94 for dairy it was 2.63and for horticulture it was 2.44.

The highest benefit cost was observed or found in case of 'sugarcane+dairy+horticulture' (1:2.62) followed by 'sugarcane+dairy' (1:2.47), 'paddy+dairy+horticulture' (1:1.69) and 'paddy+dairy' (1:1.43). The probable reason for reduced the above results may be that because of availability of irrigation water for farmers in Pandavapura, they are cultivating horticultural crops like banana, tomato, coconut etc. along with sugarcane. Hence, these horticultural crops contributing more towards farmers benefit with reduced cost of production.

To assess the livelihood security of farmers practicing different farming systems, six dimensions were identified *viz.* food and nutritional security, economic security, ecological security, social security, psychological security and physical security. Dimension-wise analysis of livelihood security of farmers under different farming systems in Mandya district was done and results are depicted in Table 3 and discussed in the following paragraph.

Table 3: 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 (n_5=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 (n_6=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 (n_7=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 (n_8=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

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The results from the Table 3 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 personality development (58.66 %, rank IV) were the major dimensions of livelihood security. Likewise in '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 from the Table 2 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 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 lead to provide recognition to farmers in society and ensures employment to farm family members round the year. Construction of new house, purchase of equipment's etc. lead to physical security. Combination of farming systems helps in improving farmers knowledge, gives confidence and it gives higher satisfaction.

Conclusion

The different farming systems practiced by farmers have provided effective recycling of produce of one component as input to the other component. It also provided flow of cash to the farmers round the year by way of disposal of milk and vegetables. 'Sugarcane +dairy+horticulture' farming system contributed higher proportion to total income with reduced cost of production. So, the economic security dimension and ecological security of livelihood security ranked first. Hence, 'sugarcane+dairy+horticulture' farming system needs to be popularized among farmers wherever horticulture crops possible along with sugarcane can be taken up through appropriate extension interventions of developmental departments to strengthen the livelihood security of the farmers in Mandya district of Karnataka.

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Comment [D6]: At least you need to have 10 references for acceptance to publish but you only have 7 references.

Comment [D7]: Your referencing is not accordingly in all these references. It should be the Author, year, title, journal, volume, no. location

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