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Economic empowerment of scheduled caste farmers through livestock based integrated farming system approach

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Abstract

The study was conducted in purposively selected Bengaluru Urban district. Total sample of 242 respondents were purposively selected for the study. Data was analyzed by using appropriate statistical tools. The results revealed that, majority of the respondents belongs to medium level of education, land holding, cropping pattern, livestock possession, mass media exposure, extension participation, social participation, scientific orientation, training undergone, participation in development programme, willingness towards agriculture and access to extension personnel and, high level of innovativeness, risk orientation, management orientation, level of aspiration and access to resources. Further low level of cosmopolitaness. It was observed that livelihood security improved from less satisfied (44.21%) to highly satisfied (37.19%) level. Overall scores indicated that 48.37 percent increase in before and after implementation of project. Livestock component generates 323 mandays employment and provides additional net income of Rs. 68860 to beneficiary farmers. In 2018 reported that the average gross income of farmers increased to Rs. 118564 from both crop and livestock enterprises of IFS against Rs. 12062 before implementation of the project. As such, they are getting 3.41 rupee income for every one rupee investment under IFS. The characteristics such as Cropping pattern, Innovativeness, Training undergone, Willingness towards IFS and Access to extension personnel exhibited positive and significant relationship with farmer's livelihood security. Hence, the concerned development departments should organize the demonstrations, trainings, field days, exposure visits etc., to educate the farmers about IFS. The positive and significantly related characteristics need to be considered while selecting the farmers for the extension educational programmes to enhance their livelihood security.

Keywords: Integrated farming system, scheduled caste and livelihood security

Introduction

Agriculture has always been considered as the back-bone of our country. In India 58 % of rural population is engaged in agriculture and 80% of population live, directly or indirectly on income delivered from agriculture (Harshitha *et al.*, 2018) [4]. The operational farm holding in India is declining and over 85 million out of 115 million are below the size of 1 ha (Manjunatha *et al.*, 2014) [7]. Due to ever increasing population and decline in per capita availability of land in the country, practically there is no scope for horizontal expansion of land for agriculture. Only vertical expansion is possible by integrating farming components requiring lesser space and time and ensuring reasonable returns to farm families. The Integrated Farming System therefore assumes greater importance for sound management of farm resources to enhance the farm productivity and reduce the environmental degradation, improve the quality of life of resource poor farmers and maintain sustainability. There are 115 million operational holdings in the country and about 80 % are marginal and small farmers (Manjunatha *et al.*, 2014) [7]. Most of the scheduled caste farmers comes under small and marginal category of land holding and agricultural labourers. They are directly or indirectly depending on

agriculture for their livelihood. The per capita land holding of SC farmers is 1.3 ha as against state average of 1.74 ha. These farmers are doing farming activity to fulfill the basic needs of house hold including food (cereal, pulses, oilseeds, milk, fruit, honey, meat, etc.), feed, fodder, fiber, etc. but their main focus was individual components but not in a integrated manner and this made attention about Integrated Farming System.

At the ICAR and State Agricultural Universities level, lot of efforts have been made aiming at increasing the productivity of different components of farming system i.e. crops, horticultural crops, livestock (dairy, goatry, piggery), poultry (chicken, ducks, quail, pigeons), lac cultivation, apiculture, sericulture, mushroom cultivation, organic manures production, bio- gas etc. individually but lacking in their integration by following farming system approach. The integration is made in such a way that product of one component should be the input for other enterprises with high degree of complimentary effects on each other. The University of Agricultural Sciences, Bangalore implemented the project entitled "Livelihood Improvement of Scheduled Caste (SC) Farm Families through Integrated Farming System (IFS)" with the financial support from the

Government of Karnataka under Scheduled Caste Sub Plan (SCSP) during the period from 2014-15- to 2018-19. The project aims at sustainable development of agriculture among the farmers by bringing them to mainstream and also efficient management of soil, water, crop and IPM practices in crop husbandry. Further, it integrate dairy, poultry, sheep, piggery, fishery, sericulture, agro-forestry and other related enterprises with crop husbandry which increases the overall net income. With this background, the present study is conceptualized with following objectives

1. To know the personal and socio-psychological characteristics of respondents
2. To measure the livelihood security of SC farmers practicing Integrated Farming System
3. To analyze the impact of Integrated Farming System on development of SC farmers
4. To know the relationship between personal and socio-psychological characteristics of respondents with their livelihood security.

Methodology

The study was conducted in purposively selected Bengaluru Urban district of Karnataka based on the implementation of the project entitled "Livelihood Improvement of Scheduled Caste (SC) Farm Families through Integrated Farming System (IFS)" by University of Agricultural Sciences, Bangalore during 2014-15 to 2018-19. Three taluks were selected namely Anekal, Bangalore North and Bangalore South from Bengaluru Urban district. Two grama panchayats from each taluk and three (03) to four (04) villages/ grama panchayats were selected based on maximum number of SC farm families. All the farm families having land holding 1 to 5 acres land were considered as beneficiaries (respondents) of the project. Total sample of 242 respondents were purposively selected for the study. Data was analyzed by using appropriate statistical tools.

Results and Discussion

It was observed from Table 1 that, the majority respondents belonged to medium level of education, land holding, cropping pattern, livestock possession, mass media exposure, extension participation, social participation, scientific orientation, training undergone, participation in development programme, willingness towards agriculture and access to extension personnel. This finding can be explained on the basis of the fact that the rural social environment was the major cause for such trend. As the rural people are still traditional bound, they don't prefer to continue their children education, the distance of higher study centres from villages also might have prevented the parents from providing higher education to their children. Participation in extension activities and development programmes provided opportunities for them to improve their knowledge about IFS technologies and to be rational in decision making and in adoption of new technologies. Nowadays villages have more number of social organisations such as village panchayat, taluk panchayat, farmer co-operatives etc., might have made them to take part in it. Further, the government policy of reservation to SC farmers in these organization might have enhance their participation in social organisation. The above trend in

cropping pattern and livestock possession is noticed because all respondents received inputs like improved seeds, planting material and livestock components like cow or sheep and poultry birds through project and getting optimum production, productivity and net income. The study results were supported by the findings of Sujay Kumar (2012) [12], Mamathalakshmi (2013) [6] and Rokonuzzaman (2013) [10].

The study conferred that respondents belonged to high category of innovativeness, risk orientation, management orientation, level of aspiration and access to resources. High level of innovativeness, risk orientation, management orientation and level of aspiration due to the fact that most of the respondents were aware about new ideas, as they attend different training programs and field visits which is conducted by development department and state agricultural universities which make opportunity to exploit the potentialities of IFS enterprises. Such individuals would be possessing more entrepreneurial characteristics like innovativeness, achievement motivation etc. Further low level of cosmopolitaness. It could be due to the fact that the village does not had better road connectivity and transport facilities, which enabled the respondents not to visit city to sell their produce, to purchase inputs, to meet the officers of developmental departments / project staff to seek advice or to derive benefits as well as for domestic purposes and entertainment.

A critical appraisal of Table 2 indicated that in Bengaluru Urban district, it was observed that the livelihood security of respondents before implementation of project indicates that 44.21 percent of respondents were less satisfied, followed by 33.06 percent and 22.73 percent of respondents were belonged to satisfied level and highly satisfied level of livelihood security, respectively. After implementation of project 37.19 percent of respondents were belonged highly satisfied category followed by 31.82 percent and 30.99 percent of them were belonged to less satisfied and satisfied categories of livelihood security, respectively.

The data depicted in Table 3 indicated that, the improvement in different dimensions of livelihood security before and after the implementation of project in Bengaluru Urban district. It was noticed that maximum percent (66.21) increase was observed in employment security followed by living amenities (65.57 %), economic efficiency (51.08 %), social equitability (44.16 %), ecological security (39.12 %), assets (36.46 %) and coping strategies against stress (35.15 %). Overall scores indicates 48.37 percent increase in before and after implementation of project.

Relationship between personal, psychological and socio-economic characteristics of respondents with their livelihood security

The findings in the (Table 4) implied that, five (05) out of 18 characteristics found to have significant relationship with livelihood security. The characteristics such as Cropping pattern, Innovativeness, Training undergone, Willingness towards IFS and Access to extension personnel exhibited positive and significant relationship with farmer's livelihood security at 1 percent level.

Livelihood security and cropping pattern

It is existent from the results that there was a positive and

significant relationship between cropping pattern and livelihood security. Farmers mainly depend on farming for their livelihood, increasing the cropping intensity gives better income. This in turn influences livelihood security of the respondents.

Livelihood security and innovativeness

Innovativeness had a positive and significant relationship with livelihood security of respondents. The possible reason might be that innovativeness of an individual is closely associated with change, adopting innovative ideas and practices leading to security for the life. The findings are in conformity with the results obtained by Devarajaiah (2010) [2] and Mamathalakshmi (2013) [6].

Livelihood security and training undergone

The exposure of respondents to trainings increases their confidence level and skills to do varied works as a result earnings also increases. Hence, training received had positive and significant relationship with livelihood security of respondents. The findings are in conformity with the results obtained by Hardeep Kaur (2007) [3] and Mamathalakshmi (2013) [6].

Livelihood security and willingness in agriculture

It is clear from the results that there was a positive and significant relationship between willingness in agriculture and livelihood security. As farmers mainly depends on farming, willingness to do agriculture, to utilization of available resources, which leads to higher productivity, profitability, generates employment and finally income of farm. This in turn influences livelihood security of respondents.

Livelihood security and access to extension personnel

The access to extension personnel of the respondents was found to be significantly correlated with their livelihood security. The respondents had regular contact with the

agriculture officers, KVK scientists and farm scientists of UAS, Bangalore through project. Due to their regular contact with the extension professionals the respondents have developed favourable attitude towards the IFS and other side improving their livelihood.

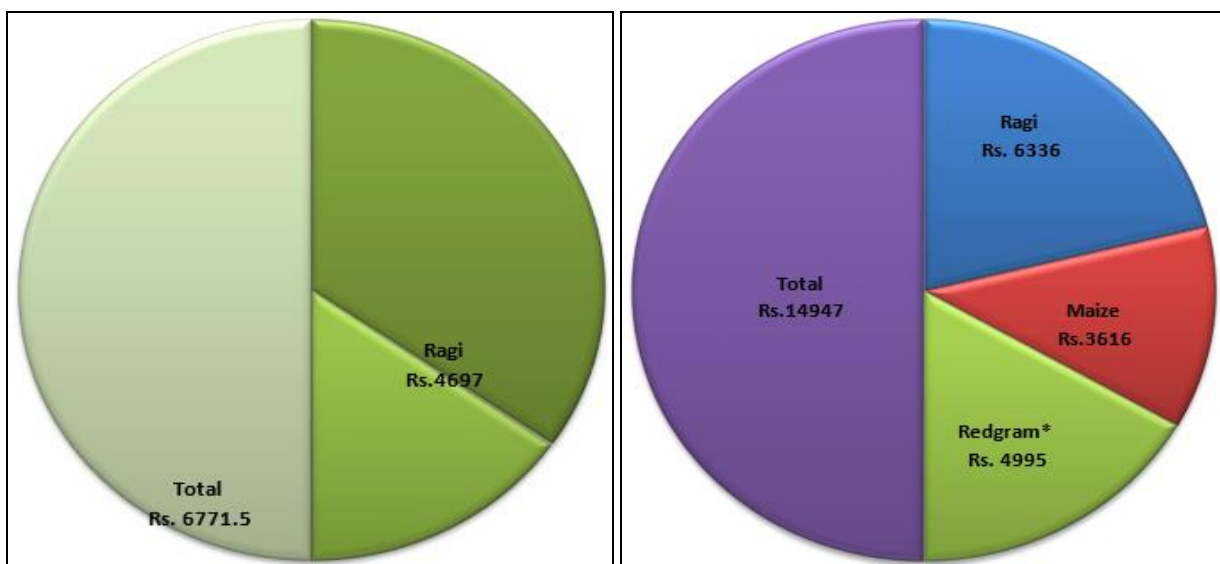
Extent of contribution of personal, psychological and socio-economic characteristics to livelihood security of respondents

The regression test was applied to ascertain the contribution of independent variables to the livelihood security of respondents and the results are presented in Table 5.

The results of multiple linear regression analysis showed that variables such as innovativeness, management orientation, training undergone and access to extension personnel had significantly contributed at 0.01 percent level of probability. Cropping pattern and extension participation had significantly contributed at 0.05 percent level of probability. The R2 value of 0.313 indicated that all 18 variables had contributed to the tune of 31.3 percent of variation in livelihood security.

Data presented in Table 6 indicated that, after implementation of the project, the average yield of ragi and maize increased to 63.64 percent and 58.33 percent, respectively. IFS beneficiary farmers introduced cow, sheep and backyard poultry as livestock components in their farm and redgram as intercrop along with crop component. Livestocks component generates 323 mandays employment and provides additional net income of Rs. 68860 to beneficiary farmers.

In 2018 reported that the average gross income of farmers increased to Rs. 118564 from both crop and livestock enterprises of IFS against Rs. 12062 before implementation of the project. In total he could realize about Rs. 83807 net profit by adopting IFS in their farm. As such, they are getting 3.41 rupee income for every one rupee investment under IFS.



Crop component before implementation of project Crop component after implementation of project

Fig 1: Income of IFS farmers from crop component before and after implementation of IFS project in Bengaluru Urban district

Table 1: Distribution of respondents according to their personal and socio-psychological variables (N=242)

Sl. No.	Variables	Category	Number	Percent
1.	Education	Low	48	19.83
		Medium	145	59.92
		High	49	20.25
2.	Land holding	Marginal	49	20.25
		Small	103	42.56
		Big	90	37.19
3.	Cropping pattern	Low	70	28.93
		Medium	101	41.74
		High	71	29.34
4.	Livestock possession	Low	82	33.88
		Medium	84	34.71
		High	76	31.40
5.	Cosmopolitaness	Low	89	36.78
		Medium	69	28.51
		High	84	34.71
6.	Innovativeness	Low	87	35.95
		Medium	64	26.45
		High	91	37.60
7.	Mass media exposure	Low	75	30.99
		Medium	98	40.50
		High	69	28.51
8.	Extension participation	Low	70	28.93
		Medium	102	42.15
		High	70	28.93
9.	Social participation	Low	64	26.45
		Medium	108	44.63
		High	70	28.93
10.	Scientific orientation	Low	63	26.03
		Medium	96	39.67
		High	83	34.30
11.	Management orientation	Low	78	32.23
		Medium	75	30.99
		High	89	36.78
12.	Level of aspiration	Low	70	28.93
		Medium	73	30.17
		High	99	40.91
13.	Risk orientation	Low	74	30.58
		Medium	79	32.64
		High	89	36.78
14.	Training undergone	Low	74	30.58
		Medium	126	52.07
		High	42	17.36
15.	Participation in the developmental programme	Low	49	20.25
		Medium	140	57.85
		High	53	21.90
16.	Willingness towards IFS	Low	75	30.99
		Medium	94	38.84
		High	73	30.17
17.	Access to extension personnel	Low	65	26.86
		Medium	105	43.39
		High	72	29.75
18.	Access to resources	Low	70	28.93
		Medium	84	34.71
		High	88	36.36

Table 2: Distribution of respondents according to their livelihood security in Bengaluru Urban district (N=242)

District	Category	Before		After		Change in Percent
		Number	Percent	Number	Percent	
Bengaluru Urban	Less satisfied	107	44.21	77	31.82	-10.31
	Satisfied	80	33.06	75	30.99	-1.87
	Highly Satisfied	55	22.73	90	37.19	13.47
	Total	242	100.00	242	100.00	

Table 3: Dimension-wise analysis of livelihood security pattern among respondents in Bengaluru Urban district (N=242)

SI. No.	Dimension	Mean Value		Percentage increase
		Before	After	
1.	Assets	960	1310	36.46
2.	Living amenities	822	1361	65.57
3.	Economic efficiency	415	627	51.08
4.	Ecological security	588	818	39.12
5.	Social equitability	634	914	44.16
6.	Coping strategies against stress	660	892	35.15
7.	Employment security	728	1210	66.21
	Overall Livelihood Security	4807	7132	48.37

Table 4: Relationship between independent variables with the Livelihood Security of IFS farmers (N=242)

SI. No.	Independent variables	Correlation co-efficient (r)
1.	Education	-0.041
2.	Land holding	-0.015
3.	Cropping pattern	0.169**
4.	Livestock possession	0.047
5.	Csmopoliteness	-0.085
6.	Innovativeness	0.353**
7.	Mass media exposure	-0.104
8.	Extension participation	0.103
9.	Social participation	0.053
10.	Scientific orientation	-0.007
11.	Management orientation	0.0176
12.	Level of aspiration	0.124
13.	Risk orientation	0.018
14.	Training undergone	0.337**
15.	Participation in the developmental programme	0.039
16.	Willingness towards ifs	0.204**
17.	Access to extension personnel	0.260**
18.	Access to resources	0.124

NS: Non-Significant; *: Significant at 5% level; **: Significant at 1% level.

Table 5: Multiple regression analysis of independent variables of respondents with their livelihood security (N=242)

SI. No	Variables	Regression coefficient (b)	Std. Error of regression co-efficient (SE _b)	't' value
1.	Education	-.013	.254	-.050
2.	Land holding	.247	.493	.501
3.	Cropping pattern	.060	.028	2.095*
4.	Livestock possession	-.023	.067	-.345
5.	Cosmopoliteness	-.023	.157	-.148
6.	Innovativeness	.526	.150	3.510**
7.	Mass media exposure	-.077	.137	-.564
8.	Extension participation	.315	.148	2.127*
9.	Social participation	.023	.091	.250
10.	Scientific orientation	-.173	.119	-1.451
11.	Management orientation	-.331	.099	-3.353**
12.	Level of aspiration	.046	.079	.587
13.	Risk orientation	-.015	.088	-.172
14.	Training undergone	.967	.267	3.616**
15.	Participation in the developmental programme	.200	.340	.588
16.	Willingness towards ifs	.004	.086	.051
17.	Access to extension personnel	.290	.080	3.631**
18.	Access to resources	.082	.066	1.234

R²= 0.313, F= 5.32 NS: Non-Significant; *: Significant at 5% level; **: Significant at 1% level.

Table 6: Economic analysis of Integrated Farming System (IFS) components before and after implementation of project in Bengaluru Urban district (N=242)

Crop Component	Before									After									Change in yield (%)	Change in Income (%)	Emply. Gene. in (Mandays/ac.)	Emply. Gene. of Beneficiary farmers (Mandays)
	Avg. Land Holding (Acre.)	Avg. Yield (Ql./ac.)	Avg. yield of Beneficiary farmers (Ql./ac.)	Price (Rs./Ql.)	Prod. Cost/ac. (Rs.)	Prod. Cost of Beneficiary farmers(Rs.)	Gross Income (Rs./ac.)	Net Income (Rs./ac.)	B:C Ratio	Avg. Yield (Ql./ac.)	Avg. yield of Beneficiary farmers (Ql./ac.)	Price (Rs./Ql.)	Prod. Cost/ac. (Rs.)	Prod. Cost of Beneficiary farmers(Rs.)	Gross Income (Rs./ac.)	Net Income (Rs./ac.)	B:C Ratio					
Ragi (n1=139)	0.66	5.50	3.63	1550.00	5800.00	3828.00	8525.00	4697.00	2.23	9.00	5.94	1900.00	7500.00	4950.00	11286.00	6336.00	2.28	63.64	32.39	85.00	56.10	
Maize (n2=103)	0.45	6.00	2.70	1310.00	3250.00	1462.50	3537.00	2074.50	2.42	9.50	4.28	1425.00	5500.00	2475.00	6091.88	3616.88	2.46	58.33	72.23	66.00	29.70	
Redgram*										1.50	1.67	3800.00	1200.00	1332.00	6327.00	4995.00	4.75			6.00	6.66	
Total						5290.50	12062.00	6771.50	2.28					8757.00	23704.88	14947.88	2.71		96.53		92.46	
Livestock Component	Body live wt. or Ltrs/ sheep or poultry or pig or cow		Price/kg or Ltr		Cost		Gross Income (Rs.)	Net Income (Rs.)	B:C Ratio	Body live wt. or Ltrs/ sheep or poultry or pig or cow		Price/kg or Ltr		Cost	Gross Income (Rs.)	Net Income (Rs.)	B:C Ratio	Change in yield (%)	Change in Income (%)	Emply. Gene. (Mandays)	Emply. Gene. of Beneficiary farmers (Mandays)	
Cow (n1=130)										1620.00		28.00		17000.00	45360.00	28360.00	2.67				228.00	
Sheep (n2=112)										120.00		400.00		9000.00	48000.00	39000.00	5.33				95.00	
Poultry*(n3=160)										10.00		150.00			1500.00	1500.00						
Total														26000.00	94860.00	68860.00	3.65				323.00	
Grand total						5290.50	12062.00	6771.50	2.28					34757.00	118564.88	83807.88	3.41		96.53		415.46	

* Inter crop

Conclusion

The results revealed that the livelihood security improved from less satisfied to highly satisfied level, out of seven dimensions of livelihood security maximum increase was noticed in employment security. Further, respondents earned Rs.3.41 income for every one rupee investment under IFS. Hence, encourage the farmers to practice IFS which helps to increase their livelihood by organizing extension educational programmes by the concerned development organisations. The characteristics such as Cropping pattern, Innovativeness, Training undergone, Willingness towards IFS and Access to extension personnel exhibited positive and significant relationship and contributed to the tune of 31.30 percent of variation in livelihood security of respondents. Hence, concerned departments and organizations should give more emphasis towards amplification of these characteristics to enhance livelihood security of farmers practicing IFS.

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