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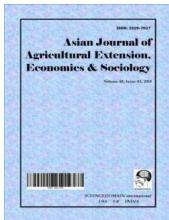
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Contribution of Integrated Farming System for Livelihood Security of Tribal's in Pachamalai Hill of Tiruchirappalli District

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Out of 115 million operational holdings in India, about 80 per cent of Indian farmers are marginal and small farmers. To achieve sustainable development in income and employment to fulfill the basic needs of the farmers in plains and also in hilly areas, an integrated farming system plays a vital role in India. The present study was undertaken to recognize the contribution of integrated farming system on livelihood security and sustainable development of Tribal people. Primary data was collected from the Tribal people of Pachamalai hill situated in Tiruchirappalli district of Tamil Nadu. Most of the respondents were involved in the adoption of integrated farming system, but the components are based on size of land holding, economic conditions, knowledge, experience and interest of the respondent etc. Eight different components of Integrated farming system were

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considered in the study. Among them agriculture with backyard poultry, livestock and piggery which are adopted by most of the respondents. Farmers responses that integrated farming system has increased the economic yield per unit area by providing income to the farmers round the year, providing food, nutritional security and increasing input usage by the result of expected output. Hence it is essential to create awareness to improve knowledge, skill and attitude regarding the adoption of more components of integrated farming system. Therefore it was concluded from the study that integrated farming system is a multidimensional farming approach, which is very effective in solving many problems of achieving farmers' livelihood security.

Keywords: Agriculture; integrated farming system; livelihood security; tribal people.

1. INTRODUCTION

Globally, extreme poverty continues to be a rural phenomenon. The incidence and severity of poverty especially in India are much higher in tropical and subtropical mountainous regions, which are often poorly connected with markets and are inhabited mainly by ethnic minorities. Poverty is recognized as a significant constraint to agricultural growth in upland areas, because of poor people tend to concentrate their limited resources on low-value food crops to ensure subsistence security and the difficulties they face in mobilizing production and investment resources [1]. Thus, people in mountainous areas tend to be poorer and more food insecure compared to those in plain [2].

About 80 per cent of Indian farmers are marginal and small farmers. To achieve sustainable development in income and employment to full fill the basic needs of the farmers in plains and also in hilly areas, an integrated farming system plays a vital role in India [3]. Integrated farming is a commonly and broadly concept used to explain a more integrated approach to farming as compared to the monoculture approaches. It refers to agricultural systems that integrates both livestock and crop production. Integrated farming system has revolutionized conventional farming of livestock, aquaculture, horticulture, agro-industry and allied activities [4]. It could be crop-fish integration or any other livestock-fish integration, crop-fish-livestock integration or combinations of crop, livestock, fish and other enterprises. Integrated farming systems are less risky if managed efficiently, as they benefit from synergies among enterprises, diversity in produce, and environmental soundness [5]. The approach aims at increasing income and employment from small-holding by integrating various farm enterprises and recycling crop residues and among products within the farm

itself [6]. Farming system approach is an important solutions to face this peculiar situation as in this approach the different enterprises can be carefully undertaken and the location specific systems are developed based on available resources which will result into sustainable development [7]. Therefore, present investigation was undertaken to study the effect of integrated farming system on the sustainable development of Tribal people in Pachamalai hill of Tiruchirappalli district.

2. METHODOLOGY

A study was undertaken to assess the effect of integrated farming system on sustainable development and contribution of IFS for livelihood security of Tribal people in Pachamalai hill of Tiruchirappalli district. Through field survey and farmers meeting at farm-level, the information was collected during March, 2017. A samples of 100 farmers was selected. An interview schedule was developed to collect the data on farmers' adoption levels of integrated farming system in addition to household characteristics, farm size, production, input use, and income. The survey included also several open-ended questions to elicit farmers' perceptions regarding the systems and the broader aspects of changes in their welfare.

3. RESULTS AND DISCUSSION

Figures in Table 1 shows that the majority of the respondents were middle aged (35-50 years). Regarding educational status, the extremes were low viz., illiterate (2%) and collegiate (9%) and majority are with higher secondary education (25%). Majority the respondents were agriculture based with a good farming experience of more than 10 years. Regarding communication sources, television comes first followed by fellow farmers, friends and relatives.

Table 1. Profile characteristic of farmers

S. No	Characteristics	Frequency	S. No	Characteristics	Frequency
1.	Age		6.	Communication sources	
	Young (<35)	19		Radio	49
	Middle (35-50)	57		Television	100
	Old (>50)	24		News paper	78
2.	Educational status			Magazine	37
	Illiterate	2		Through farmers	99
	Functionally literate	7		Friends	95
	Primary	15		Relatives	86
	Middle	24		Neighbours	75
	Secondary	18		Village leaders	86
	Higher secondary	25		Government officials	28
	Collegiate	9		NGOs	46
3.	Occupational status		7.	Different IFS components adopted	
	Agriculture as primary	99		Agriculture	100
	Agriculture as secondary	1		Backyard poultry	97
4.	Farming experience			Goat rearing	57
	Low (<5 years)	15		Cattle rearing	15
	Medium (5-10 years)	32		Piggery	19
	High (> 10 years)	63		Mushroom production	-
5.	Farm size			Fishery	-
	Small (< 2 ac)	22		Rabbit rearing	2
	Marginal farmer (2-5 acre)	49			
	Large farmer (>5 acre)	29			

Table 2. Reasons for the adoption of integrated farming system in Pachamalai hill

S. No.	Developmental strategies	Number of respondents (%)		
		Low	Medium	High
1.	Food security	-	18	82
2.	Nutritional security	0	25	75
3.	Employment generation	0	45	55
4.	Income security			
	Low (<Rs.25000 per year)	-	25	-
	Medium (<Rs.250000-50000 per year)	-	-	32
	High(>Rs.50000 per year)	43	-	-
5.	Trans-migration	2	15	83
6.	Infrastructure development	11	24	65
7.	Education	-	12	88
8.	Reduced agricultural input cost	0	7	93
9.	Effective utilization of farm outputs	0	5	95
10.	Entrepreneurship development	23	51	26

It is observed in the Table 1 that majority of the farmers adopted agriculture, backyard poultry, goat rearing for their sustainable lively-hood, followed by cattle rearing and piggery, involvement in fishery and mushroom production is almost nil. The reasons for the high adoption of agriculture, backyard poultry and goat rearing might be due to the fact that they are traditional farming practices very easy to adopt and maintain at minimum cost. The feed requirement for backyard poultry and goat rearing is fetched

from their own fields is regarded as one of the most significant factors in adopting the backyard poultry and livestock. Marketing of eggs, milk and birds is quite convenient and easy, which also contribute to the high rates of adoption. The reason for the none adoption of fishery and mushroom production might be attributed to the lack of awareness and training. [8] also stated that the lack of training facilities, high market price fluctuations, lack of credit facilities and high input costs were found to be the major

Table 3. Farmers suggestions to promote integrated farming system in hilly areas

S. No.	Suggestions	Percent
1.	Government scheme should be increased	100.00
2.	Provide timely input subsidy	100.00
3.	Provide financial support to farmers	100.00
4.	Arrange regular training to the famers	98.00
5.	Need exposure visit to new technology	100.00
6.	Provide critical inputs based on location specific requirement	100.00
7.	Provide technical know -how and follow up service	100.00
8.	Model units should be established in every block	100.00
9.	Establish direct marketing facility	100.00
10.	Encourage farmers club and producers commodity group	100.00

constraints to adoption of farming systems by small and marginal farmers. Large number of respondents reported that adoption of integrated farming system has increased the economic yield per unit area through providing money around the year, provided nutritional security, food security and increased input usage depending on the expected output. The results are in close proximity with the findings of [3] and [9]. [10] and [11] who reported that food security and employment generation was highly feasible under integrated farming system, which helps in reducing migration of tribal people to rural areas.

It is observed in Table 3 that lack of information and knowledge for each practice in the adoption of new system was the main constraint in the adoption of technology in the field. [12] stated that the technology adoption is a graded process in which a farmer has to pass through different stages like awareness, interest, evaluation, training and adoption. The next factor for non adoption of fishery and mushroom production was due to lack of skill and lack of adequate input for setting up of new production unit. The respondents also suggested that the technical guidance and local markets were very crucial for starting up the new system for this area. [13] revealed that less reliable markets and non-availability inputs are the major constraints to promote integrated farming system in this area. However, the government schemes and policies are required to harness and unleash the potential of small holder producers to build their sustainable livelihoods of tribal people. Similar views were expressed by [9].

4. CONCLUSION

It is evident from the study that majority of the farmers of study were middle age group with higher secondary education. They are following integrated farming system based on their

traditional knowledge and information through mass media. The integrated farming system enables the agriculture production system sustainable, profitable and productive in hilly region. Further involvement in integrated farming system only could develop the confidence level and socio economic status of tribal people. Hence, it is clear that the following interventions are required for them to adopt the integrated farming system in a sustainable and profitable manner. Thus there is a need to organize training programmes, establishment of model demo unit consisting of various components along with models of integrated faming systems to encourage the farmers to involve in integrated farming system in a systematic manner. So, that the farmers become aware of the concept of integrated farming system model for adoption. Moreover, it is necessary to face the challenges posed by present economic, political and technological environment. Under this study it was observed that integrated farming system became an integral part of their life, which not only helps in livelihood security and sustainable development of tribal people, but also ensures food security.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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