



# Integrated Farming System for a Sustainable Livelihood

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## Authors' contributions

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

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## ABSTRACT

This paper discusses about the success story of farmer practicing Integrated Farming System (IFS) for sustainable livelihood. Present study was conducted during 2018-19 in Bayyaram village of Bayyaram mandal in Khammam district of Telangana State. A case study method was followed to document the success of IFS farmer. Mr. Vidyasagar hails from Bayyaram village of Bayyaram mandal in Khammam district of Telangana State. He adopted different IFS components such as Horticulture, Dairy, Poultry, Piggery and Fishery units. He closely supervised multiple enterprise units and followed new technologies in IFS to get sustainable livelihood. He used new methods of

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cultivation in IFS and believed that diversification with various components of farming systems results in desired profitability for IFS farmers. Hence, integration of different components with higher input recycling increased farm productivity of different farm components and also he was able to provide employment opportunities to other farmers through IFS.

*Keywords: Integrated farming system; input recycling; higher income; success.*

## 1. INTRODUCTION

India having 2.4 per cent of global geographical area and it supports more than 17 per cent of the total world population. Indian economy is mainly agriculture oriented where small and marginal farmers are the core of the Indian rural economy constituting 82% of the total farming community but possessing only 44% of the total operational land [1]. This reduction in cultivable land is mainly due to urbanization and industrialization where the average size of land holding decreased. The change in food consumption pattern had dominated the grain crops and moving towards the non-grain crops and animal products resulting in an efficient utilization of resources to develop and to meet the food and nutritional demand of the growing population.

Due to weather aberrations and depleting natural resources farmers were shifted towards a diversified agricultural enterprise like dairy, poultry, pigeon, fishery, sericulture, apiculture etc., which are best suited to their agro-climatic and socio-economic condition. Hence, Integrated Farming System was adopted and represents an appropriate combination of farm enterprises (cropping systems, horticulture, livestock, fishery, forestry, poultry) available to the farmer to raise them for profitability. IFS interact adequately with environment without disrupting the ecological and socioeconomic balance on one hand and attempts were made to meet the national goals on the other. Diversification with various components of farming systems had resulted in a desirable profitability by which young farmers were motivated towards IFS.

Integrated farming systems seems to be the answer by solving the problem of decreasing food production, decreasing income and improving nutrition of the small scale farmer with limited assets and without other impact effects on a agro-ecosystem. Thus, this has an impact on cropping system, where the amount of by product can be as higher than marketable produce. A well designed capacity building, development of new technologies and financial institutions have to be strengthened on farming systems to motivate the farmers towards IFS.

A number of success stories on Integrated Farming System in different parts of the countries were documented by scientists, agriculture officers, NGOs and private agencies. Some of the success stories related to IFS in India were reviewed for further strengthening of adoption on IFS, for increasing farmers income to gain more net profits.

Mr. Muttuppa Pujari hails from Hasanapur village, in Gulbarga district of Karnataka state. He got Rs. 4 to 5 lakhs net profit from his 8 acres of land. Apart from agriculture, he reared goats, cattle and fish. He planned and made proper strategy on convergence of each component for effective implementation at a farm level in order to increase production and productivity. In future, Mr. Pujari planned to start commercial goat, poultry and fish farming in partnership in order to increase his net income. He stated that farming with interest and zeal and also courage is required to take calculated risk is required in order to make the best profits [2].

## 2. MATERIALS AND METHODS

To document the success story of IFS farmer case study method was followed. Case study is an intensive study of an individual, group of individuals, institution, program, company, phenomenon, situation or complex contemporary question, bounded for the object, context, and time, based on detailed data obtained from multiple sources of evidences and analyzed through a combination of methods that favor the understanding of the object of the study in a multi-dimensional way. Case study is a in-depth study of a particular situation. Case study is a in-depth study of a particular situation. Case study is a method and it is used to narrow down a very broad field of research into easily researchable topic.

## 3. RESULTS AND DISCUSSION

Mr. Vidyasagar, a farmer of 58 years age belongs to Bayyaram village of Bayyaram mandal in Khammam district of Telangana State. He studied upto 10<sup>th</sup> class only due to poor economic conditions. Due to lack of sufficient

resources and technical guidance he did not get expected yields even though having sufficient land for cultivation. Mr. Sagar has 4.8 ha (12 acres) of land. He cultivated only mango at the initial stages of farming. Due to climate variability farmer got less profits even though made more investment. Due to less market prices of produce, he developed interest and started thinking innovatively by establishing multiple enterprises.

Mr. Sagar maintained dairy unit *i.e.*, 4 buffaloes (2 milching Buffalos) and he got regular income throughout the year from dairy unit. Regular vaccinations, deworming and other medications were attended well in time. He prepared own concentrate feed at home and reduced cost of the enterprise duly increasing milk quality.

He started poultry enterprise initially with rearing of 15 birds and developed incubator of 700 egg capacity in his poultry unit. Mr. Sagar purchased eggs from farmers and hatched in machine for

production of chicks. With the help of this incubator Mr. Sagar could produce about 700 chicks per month. Later, and could sell @ Rs. 35 per chick. By this the farmer could realize good profits and it has become a profitable enterprise for him.

Piggery unit (10 piglets) the farmer sold piglets at better price. He expanded the unit with little more number of piglets and could generate net income of 3 lakhs from this unit.

Mr. Sagar recycled wastage of one enterprise output as input for other enterprise unit. This is one of the success models adopted by him in the Integrated Farming System where all the by-products are converted from one form to another and used as pesticides and fertilizer for plants. Therefore, Mr. Sagar was able to reduce cost of cultivation and increased his income over a period of 3 years by maintaining multiple enterprises in his farm.

### Resource recycling of farm enterprises

Output of one enterprise unit	Input for other enterprise unit
Dairy – Dung	Composted and used for crops
Poultry – Excreta	Used for fish feeding
In Mango orchard- fallen fruits of mango and leaves of mango	Used for feeding of pigs
In farmer field – Grasses and insects	Eaten by hens

Mr. Sagar having regular contacts with Agricultural officers, Scientists and Progressive farmers and obtained farm information regularly from them and also through magazines and Vyavasaya panchangam. As a member of farmers associations he had developed network and learnt new ways of farming. Farmer regularly attended trainings conducted by different agriculture and allied sectors department officials. Hence, the knowledge levels on different enterprises was increased. He received many awards and medals. He is now sharing his experience with fellow farmers and motivating them. He encourages the youth to take up agriculture and allied activities such as poultry, piggery, goat and sheep rearing, horticulture, fishery and value addition in millets for increasing profit at the farm gate. His novel approach of progressive farming has pushed him on the path of economic progress. He has achieved success because of his hardworking, close supervision of different enterprise units and by following of scientific methods cultivation.

### IFS components, yield and net income of Mr. Vidyasagar

**Total land holding - 4.8 ha**

#### 1. Before IFS intervention

Cropping System	Area	Yield	COC (Rs.)	GR (Rs.)	NR (Rs.)
Mango	4.8 ha	48 t	4,80,000	12,00,000	7,20,000
Mango: Rs. 25 kg <sup>-1</sup>					

## 2. After IFS intervention

Type of IFS unit = Horti + Dairy + Poultry + Piggery unit

### i. Horticulture unit

Orchard	Area	Yield	Kharif & rabi (Rs.)		
			COC (Rs.)	GR (Rs.)	NR (Rs.)
Mango	4.8 ha	45 t	4,20,000	13,50,000	9,30,000

*Mango: Rs. 30 kg<sup>-1</sup>*

### ii. Fodder crops (As an intercrop in mango orchard)

Fodder crop	Area	Yield	COC
Super napier	0.12 ha	29.8 t	17,200
Cowpea	0.04 ha	1.35 t	1,300
<b>Total</b>			<b>18,500</b>

### iii. Returns from livestock unit (Units in mango orchard)

Particulars	Production		COC (Rs.)	Gross Returns (Rs.)		NR (Rs.)
	Milk	Dung		Milk	Dung	
Dairy (2 milching Buffalos)	4,380 lit/yr	36 tonnes of dung	1,30,520 + 18,500 = 1,49,020	1,75,200 lit/yr = 2,11,200	36,000 (dung)	62,180
Poultry (700 birds)	1050 kg of meat		78,600	3,15,000		2,36,400
Piggery (10 piglets)	1300 kg		90,000	3,90,000		3,00,000
<b>Grand total</b>						<b>5,98,580</b>

Cattle: Rs. 21,900/animal/yr; Milk: Rs. 40 lit<sup>-1</sup>; Dung: Rs. 1000 /t  
Poultry unit COC = Rs. 78,600; Piglet: 130 kg; Pig cost: Rs. 300 kg<sup>-1</sup>

Net returns from IFS unit = Horti + Dairy + Poultry + Piggery  
= Rs. 9,30,000 + Rs. 62,180 + Rs. 2,36,400 + Rs. 3,00,000  
= Rs. 15,28,580

Additional income generated through IFS unit = Rs. 15,28,580 - Rs. 7,20,000  
= Rs. 8,08,580

The above findings are inline with the findings of Pankaja et al. [3] and Muttanna [2], [4,5].

## 4. CONCLUSION

Integration of various enterprises with location specific combinations had increased productivity of different farm enterprises. Better understanding nature and capacity of the interaction among various farm enterprises, higher rate of input recycling helped to farmer to gain more profits. Mr. Sagar obtained higher economic benefits by adoption of IFS. Mr. Sagar achieved success through adoption of different farm enterprise units and he became role model for other farmers to take up IFS in farming.

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### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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