

International Journal of Agriculture Extension and Social Development

Volume 7; Issue 6; June 2024; Page No. 425-428

Received: 16-03-2024
Accepted: 18-04-2024

Indexed Journal
Peer Reviewed Journal

Enhancing rural livelihoods through diversified agriculture for sustainable livelihood: A case study of an innovative farmer from northern agro-climatic zone of Telangana state

¹DRK Saikanth, ²M Jaganmohan Reddy, ³V Sudha Rani, ⁴Baby Akula and ⁵D Srinivasa Chary

¹Ph.D. Agricultural Extension, PJTSAU, Hyderabad, Telangana, India

²Professor and Director EEI, Hyderabad, Telangana, India

³Professor, Director of Extension, PJTSAU, Hyderabad, Telangana, India

⁴Professor, Department of Agronomy, PJTSAU, Hyderabad, Telangana, India

⁵Associate Professor., Department of Statistics and Mathematics, PJTSAU, Hyderabad, Telangana, India

DOI: <https://doi.org/10.33545/26180723.2024.v7.i6f.738>

Corresponding Author: DRK Saikanth

Abstract

The scientific basis for advocating diversified agriculture as a sustainable approach in India is robust, rooted in the interplay of ecological balance, economic stability, and social welfare. Diversified agriculture encompasses a variety of farming practices that reduce dependence on single-crop cultivation, integrating multiple crop species and livestock to create a holistic farming system. This integration proves vital for risk mitigation, allowing farmers to withstand climatic and market fluctuations more effectively by spreading potential losses across a broader portfolio of agricultural products. Economically, this approach facilitates increased income streams through high-value crops and added products such as honey and dairy, which fetch higher market prices. Scientifically, the benefits extend to enhanced soil fertility through natural processes such as nitrogen fixation by leguminous plants and improved nutrient cycling in integrated crop-livestock systems. In India, rising population demands linked with reduced availability of agricultural resources ultimately result in declining productivity. This requires an urgent need to reorient agricultural research programmes from an individualistic enterprise approach to need developed holistic approach to the integrated farming system. An Integrated Farming System (IFS) is a mixed farming system created up at least two interdependent but logically connected sections of a crop and livestock enterprise. It is an eco-friendly approach in which the waste of one component becomes the input of another component, thus making more effective use of resources from the farm. This paper discusses about the success story of farmer practicing Integrated Farming System (IFS) for sustainable livelihood. The Present case study method was followed to document the success of IFS farmer. Mr. M Mallikarjun Reddy during 2022-23 in Pedda Kurumapally village, Choppadandi Mandal, Karimnagar district, Telangana State. He adopted different IFS components such as Agriculture, Horticulture, Dairy, Poultry, sheep and Fishery units. He closely supervised multiple enterprise units and followed new technologies in IFS to get sustainable livelihood. He used new methods of 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 youth and other farmers through diversification of enterprises.

Keywords: Diversification, Integrated farming system (IFS), livelihood, case study, input recycling, higher income, success.

1. Introduction

Agriculture and allied sector is unique because of its diversity and location specific requirements, necessitating adaptation of technologies to a range of agro ecological conditions. Earlier it was subsistence farming, where a farmer produced whatever quantity was necessary to sustain his farm and family with the advancement of technology, there are lots of changes in the society and its waves are reflected in the agricultural sector also. With the paradigm shift from green revolution to evergreen revolution, the focus on livelihood diversification needed to be broadened to adopt sustainable livelihood approach. Livelihood security is an important mechanism for economic growth and it can be facilitated by technological breakthrough, changes in consumer demand and suitable government

policy and development of requisite infrastructure. Small holdings are not well suited to farm mechanisation, and these factors, along with the farming community's poor economic situation and lack of resources, are solely to blame for the slow expansion of the Indian agricultural sector. Our country's population is anticipated to reach 1370 million by 2030 and 1600 million by 2050 (Gupta *et al.*, 2020) ^[1].

According to the country's current situation, land under cultivation may continue to decline, and by 2030, more than 20% of the existing cultivable area will be used for non-agricultural activities (Gill *et al.*, 2005) ^[2]. The underpinning for the success of the agricultural system is the preservation of biodiversity, diversification of cropping and farming methods and maximal recycling (Singh and

Ravisankar, 2015) [3]. Hence, there is a great need to create an area specific Integrated Farming System (IFS) approach in order to address the multi-dimensional issues that are now present in agriculture and related industries. Diversified agriculture supports a wider range of biological diversity at both the species and ecosystem levels (Sanderson *et al.*, 2013) [4].

Due to weather aberrations and depleting natural resources farmers were shifted towards a diversified agricultural enterprise like dairy, poultry, 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.

In India, the availability of resources, agricultural practises and location-specific human demands for food, fodder, fuel and fiber influence the coexistence of various farming systems. Integrated Farming System (IFS) can be defined as the outcome of complex interactions between several interdependent components, in which a single farmer allocates specific quantities and quality of the four inputs of production that he has access to land, labour, money, and management (Mahapatra, 1994) [5]. IFS is one of the most effective methods for improving farm households' productivity, profitability, nutritional security, quality of life, employment creation and sustainability of the farm households, especially among small and marginal farming communities (Behera *et al.*, 2013) [6]. IFS also promotes ecological soundness and long-term sustainable agriculture (Swaminathan, 1987) [7]. IFS, as a part of FRS (Farming System Research), promotes a change in farming practices to boost productivity in the cropping pattern and takes care of outstanding resource utilisation (Jayanthi, 2006) [8]. Under the gradual decline of land holding, it is vital to include land-based enterprises like fisheries, poultry, apiaries, field and horticultural crops, etc., into the farmers' bio-physical and socioeconomic environments in order to increase farming's profitability and dependability (Behera *et al.*, 2004) [9]. Through IFS, environmental sustainability gets increased by reducing the use of harmful pesticides or artificial ingredients (Xavier, 2021) [10]. Here, the IFS strategy integrates several farm businesses and recycles crops by-products and residues on the farm itself in order to increase income and employment from small holdings (Behera and Mahapatra, 1999, Singh *et al.*, 2006) [11-12]. If effectively managed, integrated farming systems are frequently less risky and profit from synergies between enterprises, diversity in yield and environmental soundness (Lightfoot, 1990) [13]. In order to promote small and marginal farms throughout the country, IFS models have been proposed by a number of researchers (Rangaswamy *et al.*, 1996; Behera and Mahapatra, 1999; Singh *et al.*, 2017) [14, 15]. Hence, the present study is undertaken to document the innovative practices followed in Integrated Farming

System (IFS) by an innovative farmer Mr. M. Mallikarjun Reddy from Pedda Kurumapally village, Choppadandi Mandal, Karimnagar District, Telangana state.

2. Materials and Methods

To document the success story of innovative diversified farmer a 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. The case study method is a comprehensive study of a social unit comprised of a person, a group, a social institution, a district or a community (Young, 1996) [16]. It is the social microscope, as stated by Burgess (1993) [17]. A case study method was followed to study an innovative farmer who hailed from Pedda Kurumapally village, Choppadandi Mandal, Karimnagar District in Telangana state. He was possessively selected for the study due to his innovativeness in Integrated Farming and he bagged "IARI innovative farmer award 2021" and Best Farmer award on University Foundation Day, PJTSAU, Hyderabad. The farmer was personally inter-viewed and data was collected with the help of a semi-structured interview schedule.

3. Results and Discussion

Mr. Mallikarjun Reddy belongs to Pedda Kurumapally village, Choppadandi Mandal, Karimnagar District, Telangana state. He is an indomitable man and with positive vibes for hard work. Even though he was a software engineer most of the time he uses to think about agriculture because he observed many people from the village come to the city with health problems, he heard from a doctor that the reason for those health problems were toxic food. With that he decided to provide non-toxic food to his family and also to the society by doing agriculture without chemicals and he comes also from an agricultural family. After resigning to his software job in a multinational company he started developing interest in farming and started keeping himself remaining busy in the farm. He used to grow only Paddy and Cotton crops in his 12 acres of land but he was getting less net income from it. After he heard about KVK Karimnagar (farm science centre) and contacted the KVK Scientists, enquired about new technologies in agriculture and started participating in various trainings conducted by Krishi Vigyan Kendra (KVK) Karimnagar and Agriculture department, attended various exposure visits which helped him to update his knowledge and current information and new technologies in agriculture. He got an annual income of Rs. 5, 22, 160 from cultivation of paddy, Cotton.

He faced problems like labour scarcity, high cost of cultivation etc. He realised and adapted KVK interventions like Integrated farming system, improvement in crop productivity, saving in cost of cultivation etc., in the same piece of land. Now he is getting annual income of Rs 11, 62,855. Beside above-mentioned interventions he also developed a low-cost manual operated weeder. The weeder was made of locally available materials to reduce the cost of weeding, he is following Integrated farming approach and

rain water harvesting through farm ponds and open wells for entire agriculture land to increase ground water level.

He is generating 2KW Solar power through solar system and utilizing for agriculture, domestic purpose. He producing bio gas through utilization of animal and various types of organic wastes and utilization of animal slurry in agriculture land. He is also cultivating improved fodder varieties like Super Napier and Hedge lucerne. Among all

the innovations of him, growing of green fodder through Hydroponics to feed livestock shows his interest towards new technologies. Practicing Organic farming to preserve natural resources, development of low cost feed for animals from pulse crops, maintenance of Poultry farm and rearing of Vanaraja chicks are the other forms of income source to him.

Table 1: Before intervention and after intervention net income of the farmer

1) Before Intervention							
Component Description		Benchmark (Baseline period 2016-17)					
Components	Names	Area (Acre)/No	Production (Q/Liter/No)	Gross income (Rs.)	Net Income (Rs.)		
Field Crop1	Paddy	10acres	408 Qntl	5,99,760	4,81,760		
Field Crop2	Cotton	2 acres	11.50Qntl	52,900	40,400		
Total				6,52,660	5,22,160		
2) Status in 2020							
Component Description		Period 2020-21				% Increase over base year	
Components	Names	Area (Acre)/No	Production (Q/Liter/No)	Gross income (Rs.)	Net income (Rs.)	Production	Income
Field Crop1	Paddy	10 acres	575 QNTL	10,74,100	8,69,100	40.93	80.40
Hort. Crop 1	Vasu	1 acre	30 QNTL	1,80,000	91,300	100	100
Hort. Crop 2	Ginger	1 acre	5 QNTL	32,500	16,850	100	100
Livestock1	Cows	4 No	1925 Liters	92,125	39,125	100	100
Livestock2	Sheep rearing	21 No	-	1,80,000	1,15,880	100	100
Other enterprise	Fish farming	600 No	-	48,000	30,600	100	100
Total				16,06,725	11,62,855		122.70

Mr. M Mallikarjun Reddy 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. M Mallikarjun Reddy was able to reduce cost of cultivation and increased his income over a period of 4 years by maintaining multiple enterprises in his farm.

He also disseminating the innovative practices of Integrated farming approaches to the farmers through KVK by conducting awareness programmes like field trainings, farmers group discussions, field days in collaboration with ATMA and other line departments. Now farmers were in a position to understand the field problems while managing the integrated farming approaches for sustainable income in different conditions.

Recognition

Because of his hard work, innovativeness in agriculture and adaptation of new technologies provided by KVK and Agriculture Department, he was honored as with "IARI innovative farmer award" nominated by KVK, Jammikunta. The award taken by the farmer during the "Pusa Krishi Vigyan Mela 2021" being held at IARI, New Delhi during 25-27 February, 2021. Received Best Farmer award on the occasion of University Foundation Day, PJTSAU, Hyderabad. Participated as representative farmer from Telangana State to attend 5th National Youth Convention on "Next Generation Agri Innovations in Agri and Allied sector organized at IGKV-Raipur jointly with AIASA and ICAR on 20-21st January, 2020 and has also received awards and appreciations from District Collector, Karimnagar for his innovativeness in developing Integrated Farming System through integration of various enterprises in his farm.

Contributing factors for the success

Constant moral support from the family to achieve milestones in the field of agriculture, dairy, sheep, fishery and poultry farming.

Importance for farmers

He took up dairy farming and gave away a promising career as a software engineer, he is truly a role Model for other farmers in the district. He has proven that the adoption of technology in agriculture, horticulture, dairy farming will facilitate in maximising the profit and the technical backstopping backed with guidance, mentorship, and timely help about the latest trends in agritech sector help in reaping benefits.

Capacity building and training support provided by ATMA, KVK, SAU, ICAR along with his enthusiasm and timely appropriate institutional interventions raised his stature as a progressive farmer of the village within a short span of time. The use of the promising technology proved to be useful as the farmers were able to get a good production and net returns from the crops cultivated and other enterprises in comparison to the earlier times. Many farmers and youth visit his farm regularly to take a glimpse of his success and many have followed his footsteps. He became a role model for other young and enthusiastic farmers within Karimnagar and other adjacent districts.

4. Conclusion

Diversified agriculture holds significant potential for enhancing the sustainability and resilience of rural livelihoods in Telangana. By integrating various forms of crop and livestock farming, adopting non-traditional agricultural activities, and implementing innovative farming techniques, farmers can increase their income, mitigate risks, and ensure environmental sustainability. However, the

successful implementation of diversified agriculture requires overcoming structural, knowledge, and market related challenges through effective policy interventions, technological advancements, and strong community and institutional support. Integrated farming system made better utilization of resources, substantially with proper nutrition and feeding, diseases control and management, provides more profit. This case study finding showed the success of the Integrated Farming System (IFS) model followed by the farmer, where he integrated all the components of his farm and effectively used it with proper planning and management. Integration of various enterprises with location specific combinations had increased productivity of different farm enterprises. Better understanding of nature and capacity of the interaction among various farm enterprises, higher rate of input recycling helped the farmer to gain more profits. Mr. Mallikarjun obtained higher economic benefits by adoption of diversified farming and achieved success through adoption of different farm enterprise units and he became role model for other farmers to take up IFS in farming which improved his livelihood and has become an example for young farm graduates and other farmers to come forward and adopt such diversified farming activities in a scientific and well-planned manner.

5. Policy implications

This study recommends that concerted efforts need to be taken to develop and promote diversified farming as a viable option for achieving sustainable livelihood security. The benefits of IFS adoption could be extended to a larger population through policies that address the constraints in the adoption of technology, like extending credit facilities, education, and awareness. Improved access to technology will increase both the spread and intensity of IFS adoption. This also needs to be accompanied by sufficient infrastructure facilities at backward and forward production linkages.

6. References

- Gupta AK, Yadav D, Dungdung BG, Paudel J, Chaudhary AK, Arshad R. Integrated Farming System (IFS): A review paper. *Int J Eng J Appl Sci Technol.* 2020;4(9):134-7.
- Gill MS, Samra JS, Singh G. Integrated farming system for realising high productivity under shallow water-table conditions. *Research bulletins, Department of Agronomy, PAU, Ludhiana;* c2005. p. 1-29.
- Singh JP, Ravisankar N. Integrated Farming Systems for sustainable agricultural growth: Strategy and experience from research. In: *Integrated Farming systems for sustainable agriculture and enhancement of rural livelihoods. proceedings of national seminar, 13-14 December, Retired ICAR employees Association and ICAR-National Academy of Agricultural Research Management, Hyderabad;* c2015. p. 9-22.
- Sanderson MA, Archer D, Hendrickson J, Kronberg S, Liebig M, Nichols K, *et al.* Diversification and ecosystem services for conservation agriculture: Outcomes from pastures and integrated crop-livestock systems. *Renew Agric Food Syst.* 2013;28(2):129-44.
- Mahapatra IC. Farming system research: A key to sustainable agriculture. *Fertilizer News.* 1994;39(11): 13-25.
- Behera UK, Dass A, Rautaray SK, Choudhary AK, Rana DS. Integrated farming system research in India: An overview; c2013. p. 1-38.
- Swaminathan MS. In *International Symposium on Sustainable Agriculture.* International Rice Research Institute, Las Banos, Philippines; c1987.
- Jayanthi C. *Integrated farming system: A path to sustainable agriculture.* 2nd Ed., Department of Agronomy, Directorate of Soil and Crop Management Studies, TNAU, Coimbatore; c2006.
- Behera UK, Jha KP, Mahapatra IC. Integrated management of available resources of the small and marginal farmers for generation of income and employment in eastern India. *Crop Res.* 2004;27(1):83-9.
- Xavier S. Economic viability of integrated farming in Kerala. *Turk Online J Qual Inq.* 2021;7(12):3483-92.
- Behera UK, Mahapatra IC. Methodologies of farming systems research. In: Panda D, Sasmal S, Nayak SK, Singh DP, Saha S, Editors. *Recent Advances in Rice Farming Systems,* 17-19 Nov, Cuttack, Orissa, Central Rice Research Institute; c1999. p. 79-113.
- Singh K, Bohra JS, Singh Y, Singh JP. Development of farming system models for the north-eastern plain zone of Uttar Pradesh. *Indian Farming.* 2006;56(2):5-11.
- Lightfoot C. Integration of aquaculture and agriculture: a route to sustainable farming systems. *ICLARM Q.* 1990;13(1):9-12.
- Rangaswamy A, Venkataswamy R, Purushothaman, Palaniappan SP. Rice-poultry-fish integrated farming systems for lowlands of Tamil Nadu. *Indian J Agron.* 1996;41(3):344-8.
- Singh JP, Ravisankar N. Integrated Farming Systems for sustainable agricultural growth: Strategy and experience from research. In: *Integrated Farming Systems for Sustainable Agriculture and Enhancement of Rural Livelihoods. Proceedings of National Seminar, 13-14 December, Retired ICAR employees Association and ICAR-National Academy of Agricultural Research Management, Hyderabad;* c2017. p. 9-22.
- Young PV. *Scientific social surveys and research: An introduction to the background, content, methods, principles and analysis of social studies.* 4th Ed. Cliffs, NJ: Prentice-Hall; 1996. p. 247.
- Burgess. *Research Methods in Sociology.* In: Gurvitch G, Moore WE, editors. *Twentieth Century Sociology.* c1993. p. 26.