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Impact of integrated farming system on cropping pattern, income, employment and household consumption among farm households in Raipur District of Chhattisgarh

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Abstract

Integrated Farming System (IFS) integrates crop production with allied enterprises—dairy, horticulture, fishery, goatery, poultry, and piggery—to improve resource-use efficiency and livelihood security. This study assessed IFS impact on 31 farm households across eight villages in Arang and Dharsiwa blocks of Raipur district, Chhattisgarh (2025–26), using a pre-tested interview schedule and descriptive statistical analysis (averages, percentages, before-after comparison). Results show substantial gains across all indicators studied. Area under IFS rose from 0.41 ha to 1.54 ha per household, while cropping intensity increased from 107.32% to 150.41%. Average annual on-farm income grew from ₹1,10,720.40 to ₹2,04,821.60, lifting total household income by 64.63%. Employment expanded from 174 to 244 man-days per person annually. Household spending rose 21.79% on food (₹51,850.60 to ₹63,150.80) and 19.85% on non-food items (₹10,780.40 to ₹12,920.70), an overall consumption increase of 21.46%. The study concludes that IFS is an economically viable, sustainable strategy that enhances income, generates year-round employment, and improves household welfare for small and marginal farmers. Strengthening institutional credit, technical training, and extension support would aid wider adoption.

Keywords: Integrated farming system, cropping pattern, farm income, employment generation, household consumption, Chhattisgarh

1. Introduction

Indian economy is predominantly rural and agriculture oriented where the declining trend in the average size of the farm holding poses a serious problem. Indian agriculture possesses the responsibility of providing national as well as household food and nutritional security to its swarming millions. The linear growth in population and unplanned colonization lead to rapid fragmentation of land holdings and shrinkage in fertile cultivated land. In India, more than 70.00 per cent of the total population of the country still live in villages and mainly depend on agriculture and/or related enterprises. Marginal and small farmers constitute more than 84.97 percent of small and marginal holdings below 2.00 ha in 2010-11. Small and marginal holdings together operated 44.32 percent of land at the all-India level 29.00 per cent of the arable land (Akhtar *et al.*, 2014) ^[1].

In agriculture 84 per cent of the holding is less than 2 acres. Majority of them are dry lands and even irrigated areas depend on the vagaries of monsoon. In this context, if farmers concentrated on crop-production they will be subjected to a high degree of uncertainty in income and employment. The livelihoods of the small and marginal household families are the major concern. The small land holders are better contributors to the total production (78.00%) but weak in terms of generating adequate income and sustaining their own livelihood. Small holding (below 0.8 ha) does not generate enough income to keep a farm family out of poverty despite high productivity (Chand *et al.*, 2011) ^[2].

To support sustainable agriculture and improve the livelihoods of small and marginal farmers, the Government of India launched the National Mission for Sustainable Agriculture (NMSA) in 2014–15. Under its Rainfed Area Development (RAD) component, Integrated Farming System

(IFS) is promoted by integrating crop cultivation with horticulture, livestock, fisheries, agroforestry, and other allied enterprises. During 2016–17, RAD was implemented in 27 states, covering about 32,740 ha under IFS activities (Annual Report 2015–16, Department of Agriculture, Cooperation & Farmers Welfare).

The continuous decline in operational landholdings has become a major challenge to the sustainability and profitability of Indian agriculture. According to the Agriculture Census (2015–16), 86.08 per cent of operational holdings belong to small and marginal farmers, limiting their ability to generate adequate income and employment through crop production alone. Although the Government of India has promoted Integrated Farming System (IFS) as a sustainable farming approach, limited empirical evidence is available on its impact on cropping pattern, income, employment, and household consumption, particularly in Chhattisgarh. (Agriculture Census, 2015–16; NABARD All India Rural Financial Inclusion Survey (NAFIS), 2021–22)

Therefore, the present study was undertaken to assess the impact of IFS on farm households in Raipur district. The objectives of the study were as follows:

1. To find out the change in cropping pattern, income and employment pattern of the selected households in Raipur district.
2. To work out the change in food and non-food consumption pattern of the selected households in Raipur district.

2. Research Gap

Although several studies have demonstrated the economic and environmental benefits of Integrated Farming System (IFS), most have primarily focused on farm productivity, profitability, or individual enterprises. Limited empirical evidence is available on the combined impact of IFS on cropping pattern, income, employment, and household consumption, particularly under the agro-climatic conditions of Chhattisgarh. Therefore, the present study was undertaken to assess the overall impact of Integrated Farming System on farm households in Raipur district of Chhattisgarh.

3. Materials and Methods

The study was conducted in Raipur district of Chhattisgarh, India, during the agricultural year 2025–26. Raipur district was purposively selected because of the increasing adoption of Integrated Farming System. Using multistage sampling, eight villages were chosen, from which 31 IFS-practicing households

were randomly selected. Primary data on land use, enterprise combinations, income, employment, and expenditure were collected via structured interviews. Six IFS models (combinations of crop, dairy, horticulture, fishery, goater, poultry, piggery) were identified. Data were analyzed using percentage change: $(\text{Value after} - \text{Value before}) / \text{Value before} \times 100$, and cropping intensity as $\text{Gross Cropped Area} / \text{Net Sown Area} \times 100$.

4. Results

4.1 Impact of Integrated Farming System on Cropping Pattern

Table 1 The average area under Integrated Farming System increased from 0.41 ha (16.67%) before adoption to 1.54 ha (62.60%) after adoption. The average cropping intensity improved from 107.32 per cent before adoption to 150.41 per cent after adoption, representing an increase of 40.15 per cent.

Table 1: Impact of Integrated Farming System on Cropping Pattern (Average/ households)

Particulars	Before	After	% Change
Kharif	2.46	2.46	0.00
Rabi	0.10	0.91	810.00
Zaid	0.08	0.33	312.50
Total cropped area	2.64	3.70	40.15
Net cultivated area	2.46	2.46	0.00
Double cropped area	0.18	1.24	588.89
Cropping intensity (%)	107.32	150.41	40.15

The findings of the present investigation are consistent with Singh *et al.* (2020) [8] reported that integrating crops with livestock and other complementary enterprises substantially enhanced cropping intensity, farm productivity, and resource-use efficiency while improving farmers' income. Similarly, Gill *et al.* (2009) [5] observed that diversified farming systems promoted better utilization of available land resources and increased agricultural sustainability through efficient integration of multiple farm enterprises.

4.2 Impact of Integrated Farming System on Household Income

Table 2 The findings indicated that the average annual on-farm income increased from ₹1,10,720.40 before the adoption of IFS to ₹2,04,821.60 after adoption, off-farm income increased by 16.49% and non-farm income increased by 31.64%. The total income /farm has been increased 64.63%.

Table 2: Impact of Integrated Farming System on Household Income (Income/farm)

Particulars	Before	After	Difference	Percent Change over before IFS (%)
On Farm	110720.40	204821.60	94101.20	84.99
Off Farm	19160.00	16000.00	3160.00	16.49
Non- Farm	21240.00	27960.00	6720.00	31.64
Total income/farm	151120.40	248781.60	97661.20	64.63
Total income/person	1402.00	2308.00	906.00	64.62

(C- Crop; D- Dairy; F- Fisheries, G-Goater, H- Horticulture, PG- Piggery and P- Poultry)

The present study aligns with Singh *et al.* (2020) [8] conclude that integrating crop production with livestock, horticulture, fisheries, and other enterprises significantly increased farm profitability by improving resource-use efficiency and diversifying income sources. Likewise, Chandran *et al.* (2023) [3] reported that the inclusion of multiple enterprises within IFS units in Kerala contributed substantially to annual household income and reduced farmers' dependence on a single source of

earnings. Somasundaram *et al.* (2021) [9] also demonstrated that integrated farming generated higher net income and improved economic sustainability through efficient recycling of farm resources.

4.3 Impact of Integrated Farming System on Employment Generation

Table 3 shows that the average annual employment increased

from 174 man-days per household before the adoption of IFS to 244 man-days after adoption, representing an increase of approximately 40.23 per cent. The findings related to

employment generation are also supported by earlier research on Integrated Farming Systems.

Table 3: Impact of Integrated Farming System on Employment Generation (Employment days/person)

Particulars	Before	After	Difference	% Change
On-Farm	121	156	35	28.93
Off-Farm	45	75	30	66.67
Non-Farm	8	13	5	62.50
Total employment days/person	174	244	70	40.23
Total employment days/family (300 days/person/year)	648.52 (43.01%)	907.93 (20.35%)	259.41	40.00

The present study aligns with Somasundaram *et al.* (2021) ^[9] report that integrated organic farming systems generated substantially higher annual employment through the continuous management of crop, livestock, fodder, and allied enterprises. Similarly, Singh *et al.* (2020) ^[8] further emphasized that enterprise integration provides year-round employment by distributing labor requirements across different farm activities.

4.4 Impact of Integrated Farming System on Household Food and Non-Food Consumption

Table 4 indicated that the average annual household expenditure on food increased from ₹51,850.60 before the adoption of IFS to ₹63,150.80 after adoption, representing an increase of 21.79 per cent. The rise in food expenditure suggests that farm households were able to improve both the quantity and quality of their diets following the adoption of Integrated Farming System. the average annual expenditure on non-food items increased from ₹10,780.40 to ₹12,920.70, reflecting an increase of 19.85 per cent after the adoption of Integrated Farming System.

Table 4: Impact of Integrated Farming System on Household Food and Non-Food Consumption (Rs. /farm)

Particulars	Before	After	Difference	% Changes
Food Items	51,850.60	63,150.80	11,300.20	21.79
Non-food Items	10,780.40	12,920.70	2,140.30	19.85
Total	62,631.00	76,071.50	13,440.50	21.46

The present study aligns with Raghavendra *et al.* (2024) ^[7] report that adoption of IFS significantly improved farmers' dietary diversity and generated higher gross and net income compared with non-adopters. Likewise, Singh *et al.* (2020) ^[8] emphasized that enterprise diversification under IFS strengthens livelihood security by improving the availability of nutritious food, stabilizing household income, and enhancing overall well-being.

5. Summary

The present study evaluated the impact of Integrated Farming System (IFS) on cropping pattern, household income, employment, and household consumption among farm households in Raipur district of Chhattisgarh. The study was conducted in Arang and Dharsiwa blocks using primary data collected from 31 IFS beneficiary households through a structured interview schedule. The results showed that the adoption of IFS significantly improved the overall performance of farm households. Cropping intensity increased from 107.32 per cent to 150.41 per cent, indicating better utilization of available land resources. The average annual on-farm income increased from ₹1,10,720.40 to ₹2,04,821.60, while employment generation increased from 174 to 244 man-days per household per year. Household welfare also improved, as reflected in the increase in annual food expenditure from ₹51,850.60 to

₹63,150.80 and non-food expenditure from ₹10,780.40 to ₹12,920.70.

the findings indicate that Integrated Farming System enhances farm productivity, income, employment opportunities, and household welfare through enterprise diversification and efficient utilization of available farm resources.

6. Limitations

The study was limited to 31 Integrated Farming System beneficiary households from Arang and Dharsiwa blocks of Raipur district; therefore, the findings may not be generalizable to other regions. Information on income, employment, and household expenditure was collected through personal interviews and may be subject to respondents' recall bias. The study focused mainly on the economic and household welfare impacts of IFS and did not examine environmental aspects such as soil health, biodiversity, or water-use efficiency. Furthermore, changes in market conditions and climatic factors during the study period may also have influenced the observed outcomes.

7. Conclusion

The study concludes that the adoption of Integrated Farming System has significantly improved cropping intensity, household income, employment generation, and consumption expenditure among farm households in Raipur district of Chhattisgarh. Integration of crops with allied enterprises such as dairy, horticulture, fishery, poultry, goatery, and piggery enhanced resource-use efficiency, diversified income sources, and generated year-round employment opportunities. The increase in food and non-food expenditure further indicates an improvement in the socio-economic status and living standards of the beneficiary households. These findings demonstrate that IFS is an economically viable and sustainable farming approach for improving farmers' livelihoods. Promoting Integrated Farming System through technical training, institutional credit, effective extension services, and better market linkages can encourage wider adoption and contribute to sustainable agricultural development in Chhattisgarh and similar agro-ecological regions.

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