

# Augmenting farmers' income

## through Integrated Farming System Model under Farmer FIRST Programme

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*Demonstration of the Integrated Farming System model in an area of 0.5 ha in rainfed (Kandi) villages is one of the essential modules assumed under the Farmer FIRST Programme of SKUAST-Jammu. The model consists of enterprises such as crop, livestock, mushroom and vermicompost etc. with diverse coverage of land area. There was an additional generation of net income of ₹ 1.61 lakhs from an area of 0.5 ha under the IFS model as compared to the existing farming system. Besides, 130 additional employment days were also generated under IFS model demonstrated under the Farmer FIRST Programme.*

**Keywords:** Economic return, Farmer FIRST Programme, Scientific IFS model

AS THE Country is heading towards 2022, all stakeholders are figuring out ways to achieve the target of doubling the farmers' income. The Farmer 'FIRST' Programme (FFP) has also envisioned with doubling the farmers' income through popularization of the integrated farming system. The project favours the smallholder agriculture and complex, diverse and risk prone realities of the farmers through enhancement of farmers' scientist interface and demonstration of scientific modules. A project entitled "Exploring economic opportunities for farmers of Kandi villages through application of proven scientific technologies" was implemented in a cluster of 12 villages by Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu under the Farmer FIRST Programme of Indian Council of Agricultural Research, New Delhi. The selected cluster of villages falls under rainfed ecosystem where 86% land holdings of the farmers are marginal. The area receives an average annual rainfall of 750 mm.

The cost of cultivation of small and marginal farms often exceeds the returns which pose a threat to the

economic viability of farm. As a part of the continuous efforts to address all the relevant issues and to make the small farms more remunerative and sustainable, SKUAST-Jammu demonstrated the recommended Integrated Farming System (IFS) Models over an area of 0.5 ha with the objectives to converge the development of recommended farm technologies for Kandi areas to raise and sustain the total farm productivity in terms of food, feed, fodder and fuel. The economics of enterprises under existing and integrated farming system was compared to assess the impact of recommended intervention.

### Significance of Integrated Farming System model

The increasing cost of agricultural production is threatening the existence of marginal and small farmers. One could imagine the survival of small and marginal farmers through the adoption of IFS on scientific lines. The IFS is the most effective approach, not only for supplementing or stabilizing the income but also for managing natural resources and livelihood diversification. Traditionally, farmers

in India had been practicing Integrated Farming System (IFS) but now there is a need to popularize the scientific IFS models to realize greater profits in agriculture. Successful implementation of the scientific IFS model requires improved access to factor inputs and markets by the farmers. Farmers are, however, vulnerable in selecting the right choice, owing to misunderstanding on factor-factor and product-product relationships. The demonstrated IFS model includes different enterprises, namely cultivation of maize, wheat and marigold, establishing backyard nutritional kitchen gardening, backyard poultry and livestock, mushroom production etc., besides components of natural resource management.

### Details of IFS Model demonstrated

Ten Integrated Farming System models were established under Farmer FIRST Programme (FFP) over an area of 0.5 ha each. The specific area of farm land devoted to particular enterprise during *kharif* and *Rabi* seasons under IFS model is depicted in Fig. 1. Maize and wheat were the cereal crops grown in *kharif* and *rabi* season, respectively. Besides,

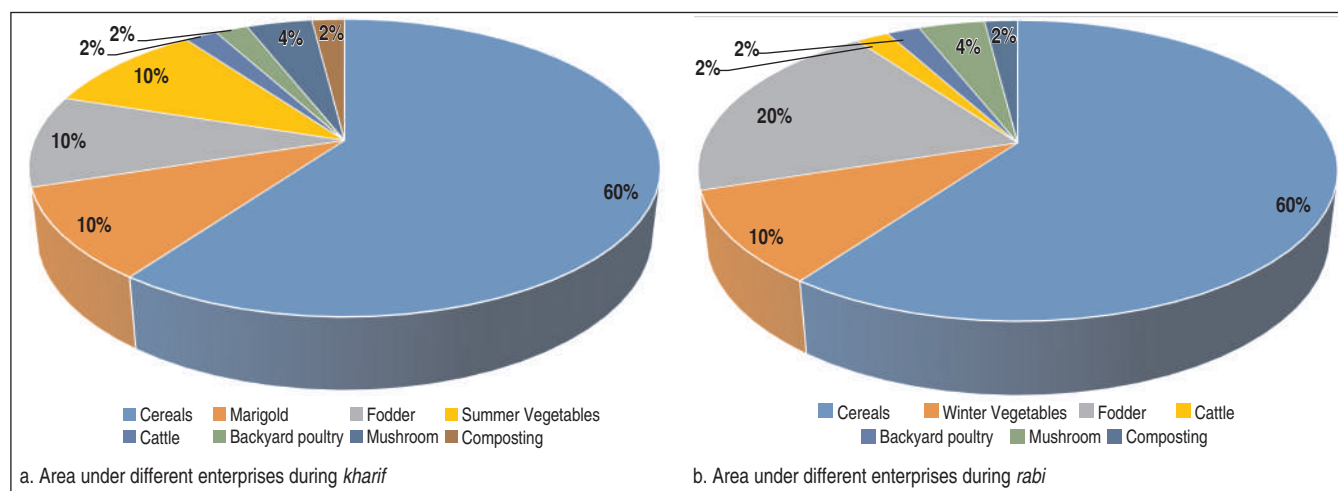


Fig. 1. Area covered under different enterprises under IFS model

cereals, some area had been devoted to marigold cultivation, keeping in view of the market demand into consideration. Seasonal vegetable production was also added as one of the enterprise to increase farm profitability.

The comparison of existing and IFS model in terms of area coverage under different enterprises is presented in Table 1.

The economics of individual enterprise during *kharif* and *rabi* season under integrated farming system demonstrated over 10 sites is discussed below:

#### Crop module under kharif

During the *kharif* season, maize was the principal crop of IFS model

under the project of FFP. The scientific package of practices issued by SKUAST-Jammu for maize crop was demonstrated. The associated economics of maize production under IFS is given in Table 2. The cost and net returns involved in cultivation of maize over an area of 0.3 ha was ₹ 4,045 and 11,450, respectively, including the cost of 17 labour days.

The glimpses of maize crop grown under IFS are presented in Fig. 2.

Marigold is the second crop component included under IFS during the *kharif* season, wherein the recommended package of practices issued by SKUAST-Jammu was demonstrated. The cost and net returns involved in cultivation of

marigold over an area of 0.05 ha was ₹ 4,800 and 10,800, respectively with involvement of 14 labour days (Table 3).

The glimpses of marigold crop grown under IFS are presented in Fig. 3.

Bajra is the third crop component included under IFS during the *kharif* season, wherein the bajra variety 'AVKB' was demonstrated. The cost and net returns involved in cultivation of bajra over an area of 0.05 ha was ₹ 2,400 and 1,900, respectively, inclusive of 13 labour days.

The glimpses of bajra crop grown under IFS are presented in Fig. 4.

Under the horticulture component, improved varieties of

Table 1. Comparison of enterprises under existing and IFS model

| Model                    | Component     | Name of component | Name of variety/breed | Area (ha) | Net return from different components | Employment generated (Days/Unit) |
|--------------------------|---------------|-------------------|-----------------------|-----------|--------------------------------------|----------------------------------|
| Demonstrated IFS Model   | <i>Kharif</i> | Maize             | Double Dekalb         | 0.30      | 11,450                               | 17                               |
|                          |               | Marigold          | Pusa Narangi/Basanti  | 0.05      | 10,800                               | 14                               |
|                          |               | Fodder            | Bajra                 | 0.05      | 1,900                                | 13                               |
|                          |               | Summer vegetables | Open pollinated       | 0.05      | 21,700                               | 18                               |
|                          | <i>Rabi</i>   | Wheat             | WH-1105               | 0.30      | 12,640                               | 13                               |
|                          |               | Winter Vegetables | Open pollinated       | 0.05      | 18,700                               | 18                               |
|                          |               | Fodder            | Oats (Kent)           | 0.10      | 5,200                                | 27                               |
|                          |               | Livestock         | Cattle (Cow)          | 0.01      | 73,060                               | 91                               |
|                          | Mushroom      | Backyard poultry  | Naked Neck (30 birds) | 0.01      | 18,000                               | 27                               |
|                          |               | White Button      | White Button          | 0.02      | 136,400                              | 39                               |
|                          |               | Composting        | Lumbricus Rubellus    | 0.01      | 4,300                                | 14                               |
|                          |               | Total             |                       | 0.50      | 314150                               | 291                              |
| Tradition Farming System | <i>Kharif</i> | Maize             | Mansar                | 0.43      | 9,595                                | 14                               |
|                          |               | Fodder (Bajra)    | Farmers selection     | 0.05      | 3,020                                | 12                               |
|                          | <i>Rabi</i>   | Wheat             | Raj 3765, 3077        | 0.43      | 11,696                               | 11                               |
|                          |               | Fodder            | Sorghum/Mustard       | 0.05      | 3,507                                | 14                               |
|                          | Livestock     | Cattle (Cow)      | Local Desi (2 cows)   | 0.01      | 66,636                               | 88                               |
|                          | Mushroom      | White Button      | White Button          | 0.01      | 58,500                               | 22                               |
|                          | Total         |                   |                       | 0.50      | 152954                               | 161                              |



Fig. 2. Maize crop under IFS model



Fig. 3. Marigold crop under IFS model

**Table 2.** Economic returns of crops under the integrated farming system

| Crop              | Area covered (ha) | Technology demonstrated                                                                              | Economics (₹)                                                                                 |
|-------------------|-------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Maize             | 0.3               | Hybrid variety, line sowing<br>Seed rate: 20 kg/ha, NPK: 60:40:20, Seed treatment                    | Cost: 4,045<br>Gross Profit: 15,495<br>Net Profit: 11,450<br>Employment days generated: 17    |
| Marigold          | 0.05              | Variety: Pusa Narangi & Pusa Basanti, NPK: 120:100:100                                               | Cost: 4,800<br>Gross Profit: 15,600<br>Net Profit: 10,800<br>Employment days generated: 14    |
| Bajra             | 0.05              | Variety: AVKB, NPK:100:60:25                                                                         | Cost: 2,400<br>Gross Profit: 4,300<br>Net Profit: 1,900<br>Employment days generated: 13      |
| Summer vegetables | 0.05              | Improved varieties of brinjal, okra, sponge guard, ridge guard, bitter guard, capsicum, bottle guard | Cost: 23,600<br>Gross Profit: 45,300<br>Net Profit: 21,700<br>Employment days generated: 18   |
| Wheat             | 0.3               | Variety: WH-1080, NPK: 60:30:20, Line sowing                                                         | Cost: 3,980<br>Gross Profit: 16,620<br>Net Profit: 12,640<br>Employment days generated: 13    |
| Oats              | 01                | Variety: Kent, NPK: 80:40:20, Line sowing                                                            | Cost: 3,100<br>Gross Profit: 8,300<br>Net Profit: 5,200<br>Employment days generated: 27      |
| Winter vegetables | 0.05              | Improved varieties of radish, fenugreek, cauliflower, cabbage, spinach, knol-khol                    | Cost: 26,600<br>Gross Profit: 45,300<br>Net Profit: 18,700<br>Employment days generated: 18   |
| Livestock         | 0.01              | Location specific UMMB & mineral mixtures                                                            | Cost: 40,000<br>Gross Profit: 113,060<br>Net Profit: 73,060<br>Employment days generated: 91  |
| Livestock         | 0.01              | Naked neck breed under backyard poultry                                                              | Cost: 14,500<br>Gross Profit: 32,500<br>Net Profit: 18,000<br>Employment days generated: 27   |
| Mushroom          | 0.02              | Year round mushroom production                                                                       | Cost: 67,050<br>Gross Profit: 203,450<br>Net Profit: 136,400<br>Employment days generated: 19 |
| Vermi compost     | 0.01              | Vermibeds                                                                                            | Cost: 2,300<br>Gross Profit: 6,600<br>Net Profit: 4,300<br>Employment days generated: 14      |



Fig. 4. Bajra crop under IFS model

labour days.

The glimpses of summer vegetables grown under IFS are presented in Fig. 5.

#### Crop module under *rabi*

Wheat is the principal crop during *rabi* in the region. The scientific package of practices issued by SKUAST-Jammu for wheat crop was demonstrated. The cost and net returns involved in cultivation of wheat over an area of 0.3 ha was ₹ 3,980 and 12,640, respectively with involvement of 13 labour days.

The glimpses of wheat crop grown under IFS are presented in Fig. 6.

During the *rabi* season, oats was the fodder crop adopted under IFS model, for which the scientific package of practices issued by SKUAST-Jammu was demonstrated under FFP. The associated economics of Oats (variety Kent). The cost and net returns involved in cultivation of oats over an area of 0.3 ha was ₹ 3,980 and 12,640, respectively with involvement of 13 labour days (Fig. 7).

summer vegetables include Brinjal, Okra, Sponge Guard, Ridge Guard, Bitter Guard, Capsicum, Bottle Guard. The cost and net returns

involved in cultivation of summer vegetables over an area of 0.05 ha was ₹ 23,600 and 21,700, respectively, which included 18

Under the horticulture component, improved varieties of winter vegetables including radish, fenugreek, cauliflower, cabbage, spinach, knol-khol etc. were demonstrated as presented in Table 8. The cost and net returns involved in cultivation of winter vegetables over an area of 0.05 ha was ₹ 23,600 and 21,700, respectively, including 18 labour days (Fig. 8).

#### Livestock module

Under the livestock module, farmers were having 1-2 cattle under which location specific Urea Molasses Mineral Blocks and mineral mixtures were demonstrated. The cost and net returns involved in the livestock module was ₹ 40,000 and 73,060, respectively with the involvement of 91 labour days. Besides, backyard poultry was also introduced under



Fig. 5. Summer vegetables under IFS model



Fig. 6. Wheat crop under IFS model

the module to raise supplementary income involving cost, net returns and employment days of ₹ 40,000, ₹ 73,060 and 91 labour days, respectively (Fig. 9).

#### Mushroom production

Mushroom production was introduced under the integrated farming system module demonstrated under the FFP. The cost and net returns involved in mushroom production was ₹ 67,050 and 136,400, respectively with involvement of 39 labour days (Fig. 10).

The final enterprise under the IFS involved vermicomposting. Under the project, vermibed technology was demonstrated and profit was ensured under buy back mechanism of worms and compost. The cost and net returns involved in mushroom production was ₹ 2,300 and 4,300, respectively with the involvement of 14 labour days

(Fig. 11).

#### Comparative Economics of IFS and existing system of farming

All the components had recorded



Fig. 7. Oats crop under IFS model

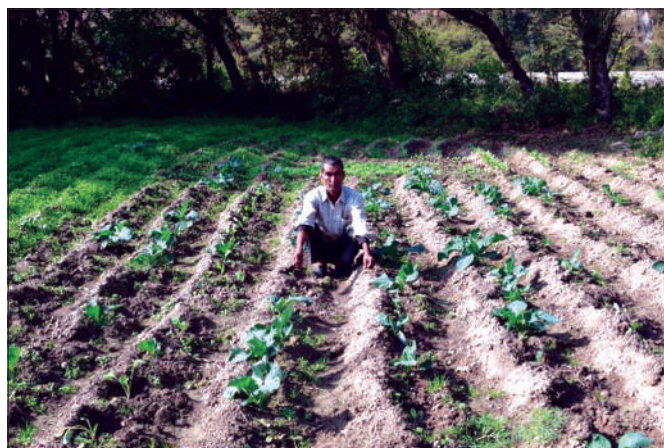


Fig. 8. Winter vegetables under IFS model

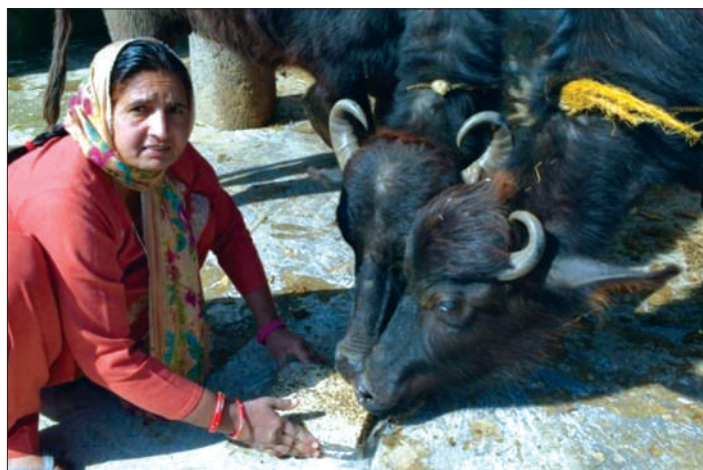


Fig. 9. Livestock module under IFS model





Fig. 10. Mushroom production under IFS model



Fig. 11. Vermibed technology under IFS model

**Table 3.** Net returns from different modules of 0.5 ha IFS model (₹/Unit)

| Component    | IFS Model |                 | Tradition Farming System |                 | Additional employment generated under IFS over existing system |                 |
|--------------|-----------|-----------------|--------------------------|-----------------|----------------------------------------------------------------|-----------------|
|              | ₹         | Employment days | ₹                        | Employment days | ₹                                                              | Employment days |
| Crop         | 82,390    | 120             | 27,818                   | 51              | 54,572                                                         | 69              |
| Livestock    | 91,060    | 118             | 66,636                   | 88              | 24,424                                                         | 30              |
| Mushroom     | 136,400   | 39              | 58,500                   | 22              | 77,900                                                         | 17              |
| Vermicompost | 4,300     | 14              | 0                        | 0               | 4,300                                                          | 14              |
| Total        | 314,150   | 291             | 152,954                  | 161             | 161,196                                                        | 130             |

higher income per unit of land under IFS as compared to the existing system among farm households due to increased productivity. Besides, profitability, the demonstrated IFS model has succeeded in achieving food and nutritional security, sustainability, recycling of unutilized resource, solving energy fuel and fodder crisis and increased

employment generation. The different enterprises have been integrated with crop activity to recycle products and waste materials of one component as input through another linked component and reduce the cost of production of the products to reduce the degree of risks associated with farming.

The comparison of annual net

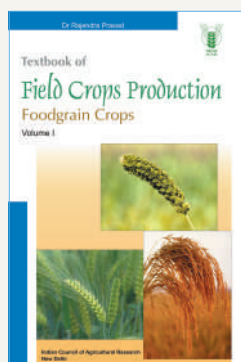
income and total employment per family under existing and demonstrated IFS model is presented in Table 3.

As a part of the continuous effort to address all the relevant issues and to make the small farms more remunerative and sustainable, the recommended Integrated Farming System Model demonstrated under 'Farmer FIRST Programme' over an area of 0.5 ha had resulted in raising farm productivity and households' sustainability in terms of food, feed, fodder and fuel.

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