



## Integrated Farming System: An Approach to Sustainability and Profitability

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### Summary

The entire philosophy of integrated farming system revolves round better utilization of time, money, resources and family labourers of farm families. The farm family gets scope for gainful employment round the year, thereby ensuring good income and better standard of living. Suitable models for different ecologies are win approach for small and marginal farmers. Albit, IFS ensure regular income, profitability and suitability for round the year production.

### Introduction

Majority of the population dependent on the agriculture are having fragmented land holding (of about 1 acre). This inter resulting in obtaining low income from a single enterprise is a challenge. On other hand, Practice of monocrop paved a way for ecological problems such as soil and water pollution, soil erosion. Integrated Farming System (IFS) is an interdependent, interrelated often-interlocking production systems based on few crops, animals and related subsidiary enterprises in such a way that maximize the utilization of nutrients of each system and minimize the negative effects of these enterprises on environment. The interrelated, inter-dependent interlocking nature of IFS involves the utilization of primary produce and secondary produce of one system, as basic input of the other system, thus making them mutually integrated as one whole unit. The main purpose of integrated farming is that the farming components support one another, hence, reducing external inputs. It is based on the concept that 'there is no waste' and 'waste is only a misplaced resource' which becomes a valuable material for another product. Sustainable agriculture, an integrated approach to increasing the farm yield and managing resources in order to address all three critical aspect of sustainability: economic, environmental and social. The IFS approach has multiple objectives of sustainability, food security and poverty reduction. It involves the use of outputs of one enterprises component as inputs for other related enterprises wherever feasible, for example, cattle dung mixed with crop residues and farm waste can be converted into nutrient rich vermi-compost.

### Integrated Farming system: perspectives and Definition

Integrated Farming System (IFS):- A sub system of a high level land use system like a village or a watershed which includes crop production, raising livestock, fishery, poultry, beekeeping etc. on a particular farm with a objective of higher profitability without altering ecological and socio-economic balance on one hand and to meet the national goals on the other hand.

Integrated Farming System (IFS) also defined as biologically integrated farming system which integrates natural resources and regulation mechanisms into farming activities to achieve maximum replacement of off-farm inputs, secures sustainable production of high quality food and other products through ecologically preferred technologies, sustain farm income, eliminates or reduces sources of present environment pollutions generated by agriculture and sustains the multiple function of agriculture (Singh et al., 2014).

### The advantages of IFS include:

1. Pooling and sharing of resources and inputs;
2. Efficient use of family labour;
3. Conservation;
4. Preservation and utilization of farm biomass including nonconventional feed and fodder resources;
5. Effective use of manure and animal waste;
6. Regulation of soil fertility and health;
7. Income and employment generation for many people; and
8. Increased economic resources.



Principle components and process of Integrated farming systems (Source: Behera, 2013)

### Types of Allied Enterprises in IFS System

- |                           |                          |
|---------------------------|--------------------------|
| 1. Dairy Farming          | 7. Rabbit farming        |
| 2. Sheep and Goat farming | 8. Bee keeping           |
| 3. Poultry farming        | 9. Pigeon rearing        |
| 4. Duck farming           | 10. Aquaculture          |
| 5. Turkey rearing         | 11. Sericulture          |
| 6. Piggery                | 12. Mushroom cultivation |

### Interrelationship among different enterprises:

#### Crop-Livestock interaction

Crop-livestock interaction takes place in two main systems. First interaction is without full integration defined as segregated system. Farmers own animals and herders might grow crops.

#### Aquaculture-Crop integration/interaction

A large quantity of silt and manure is added to the fish pond every year on an average 25 kg pond silt produce 1kg of green fodder. Rice is found to be increased by 10% due to synergistic effect of fish on rice. Weeds and insects also controlled by fish.

#### Aquaculture-Bio-gas-Livestock Integration/Interaction

Cattles in aquaculture utilizes the fodder produced through application of silt to the crop. Fish in pond feed on the zoo-planktons and phytoplankton, bacteria etc. Ducks acts as a Bio-

aerators as they aerate the pond through their legs. Bio-gas plant generate the gas used for cooking and lighting.

### **Integrated farming system Models for different ecology of India**

#### **IFS model for Dryland situation (Dryland cropping + sheep/goat + Trees/grass fodder)**

Dryland regions are the semi-arid regions with annual rainfall less than 750 mm and the length of growing period about 75 to 120 days but less than 200 days. For such situations combination of the enterprises like dryland cropping, sheep/goat and tree/grass fodder is profitable.

#### **IFS Model for Rainfed situation (Rainfed cropping + Sheep/Goat + Dryland horticulture)**

Rainfed region are the humid regions with annual rainfall more than 750 mm and growing period more than 200 days-

- Fruit trees like ber and custard apple were planted in the field.
- Interspace between fruit trees were sown with pulses and vegetables.
- Ber and custard apple started yielding from third year onwards.
- Ber yielded 20-25 kg/tree during normal rainfall year and 10-12 kg/tree during deficit rainfall.
- Custard apple yielded 10 and 5 kg of fruits during normal and deficit rainfall years respectively

#### **IFS Model with Improved Cropping (Improved cropping+ Poultry + Fish):-**

**Improved Cropping:-** The improved cropping system rice-rice-cotton (0.76 ha) and rice-rice maize (0.20 ha) was followed under IFS. Fish pond in an area of 0.04 ha was constructed. Maize was included to supply poultry feed. This system was compared with CCS of rice-rice-black gram.

**Poultry:-** Poultry shed size 4.6 x 2.4 m was prepared over fish pond at one corner. The bottom of the shed was provided with welded mesh to fall poultry dropping in fish pond.

#### **3. Fish culture:-**

- Surface feeder: Catla Catla
- column feeder: Rohu or *Labeo rohita*, Common carp
- Bottom layer feeder: Mrigala

#### **Conclusion:**

It is high time that the scientists, administrators and planners should think on such lines and provide adequate facilities and encouragement to the small and marginal farmers and rural youth to go ahead with the integrated farming systems with a sense of commitment for the rural development in totality. Implementation of the Integrated Farming System leads to sustainability and constancy in farm income through multiple enterprises that aim at the utmost utilization of available natural resources to meet the family desires. It aims at generating a threshold level of farm income required for the farm family to maintain sustained interest in farming thus preventing migration of people from the farming sector.

#### **References:**

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