

## Integrated Farming System: A sustainable path for Doubling the Farmers Income

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Agriculture in this millennium, due to emerging production scenario, higher economic growth, population explosion and shifts in dietary pattern has changed the supply and demand profiles of food respectively. Integrated farming systems (IFS) seems to be the possible solution to meet the continuous increase in demand for food, stability of income and diverse requirements of food grains, vegetables, milk, egg, meat etc., thereby improving the nutrition of the small-scale farmers with limited resources. Integration of different agriculturally related enterprises with crops provides ways to recycle products and by-products of one component as input of another linked component which reduce the cost of production and thus raises the total income of the farm. Multiple land use through integration of crops, livestock and aquaculture can give the best and optimum production from unit land area. In other words, Integrated farming system is a resource management strategy to achieve economic and sustained production to meet the diverse requirement of farm household while preserving resource base. IFS can be practiced as micro business by farm youth for attaining regular income. IFS reduces the risk of failure as often one component or one crop-based business leads to market instability. The other advantages of IFS include effective recycling of residues within the farm thereby reducing the cost of production per unit area.

Integrated farming system approach is not only a reliable way of obtaining fairly high productivity with substantial fertilizer economy but also a concept of ecological soundness leading to sustainable agriculture (Swaminathan.,1987) and also deriving maximum compatibility and replenishment of organic matter by way of proper recycling of organic residues/ waste obtained through integration of enterprises like fishery, poultry, goat, milch animal, mushroom and sericulture activities.

Integration of various farm enterprises like cropping system, animal husbandry, fishery, forestry etc., may be for optimal utilization of resources which will bring prosperity to farmers.

### Farming system focuses on;

- The interdependencies between components under the control of household and,
- How these components interact with the physical, biological and socio-economic factors, which is not under the control of household.
- Farm household is the basic unit of farming system and interdependent farming enterprises carried out on the farm
- Farmers are subjected to many socio-economic, bio-physical, institutional, administrative and technological constraints.
- The operator of the farming system is farmer or the farming family.

### Components OF Integrated Farming System

IFS will normally have combinations of three types of enterprises.

#### Primary Enterprises

Primary enterprise is normally the mainstay of the farm. An IFS farm may have one or more primary enterprises. They produce the main saleable / utilizable product of the farm and provide the major and sustained source of farm income. By-products of primary enterprises can support complementary enterprises by being their main inputs. Normally the primary enterprise is the highest income earning enterprise on the farm, to undertake which the farmer has necessary knowledge and skills, enough infrastructure and adequate labour availability.

Some of the examples of primary enterprises of IFS that are commonly seen in Karnataka are,

- Crop production:** Paddy; Paddy – sugarcane; Dry land crops like maize, ragi, etc.
- Seed production:** Field crops; vegetables, flowers, etc.
- Horticultural crops:** Coconut; Arecanut; Grapes; Mango; Pomegranate; Guava, Banana, Vegetable crops; Flower crops, etc
- Plantation crops:** Coffee; Rubber; Tea; Cashew nut; etc.

<ul style="list-style-type: none"> <li>• <b>Sericulture:</b> Mulberry cultivation and silk worm rearing,</li> <li>• <b>Animal Husbandry:</b> Dairy; Poultry; Sheep rearing; goat rearing, Fisheries, etc.</li> </ul> <p><b>Complementary Enterprises</b></p> <p>These enterprises basically help in effective utilization of the by-products of primary and other enterprises. They normally have mutually beneficial relations with primary enterprises. Their by-products are valuable inputs for other enterprises.</p> <p>Some of the examples of complementary enterprises are;</p>	<ul style="list-style-type: none"> <li>• Dairy, poultry, based on by-products of crop production</li> <li>• Mushroom production based on paddy straw</li> <li>• Food processing – based on fruits, vegetables, cereals, pulses, etc.</li> <li>• Apiculture – based on the flowers from field and horticultural crops</li> <li>• Compost preparation – based on farm wastes</li> <li>• Vermicomposting based on farm wastes</li> <li>• Biogas production</li> </ul>
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**Table 1** Characteristic Features of Farming Systems

Features	Wet Land Farming	Garden Land Farming	Dry Land Farming	Rain Fed Farming
Farming duration	9-12 months	9-12 months	<6 months	6-8 months
Source of water	River, Lake, Pond	Well	Rainfall < 800 mm	Rainfall >800 mm
Climate	Arid to humid	Arid to humid	Arid to semiarid	Sub humid to humid
Irrigation	Natural Flow(canal)	Lift irrigation	No irrigation	Supplemental irrigation
Water management	Management of excess water Eg: Drainage	Economical use of water (WUE)	Water Conservation	Disposal of excess water during high rainfall period.
Fertilizer Management	Liberal use	Liberal use	Limited use	Adequate
Objective	Maximization of yield	Yield maximization	Sustainable yield	Yield maximization
Constraint	Drainage water logging salt formation	Salt affected land	Soil erosion due to undulating lands	Water erosion

### Supplementary Enterprises

These enterprises need not necessarily depend on other enterprises on the farm, but will be taken up as additional activities to make effective use of manpower and to supplement the farm income. Some of the examples of supplementary enterprises are; back yard poultry, sheep rearing, pig rearing, kitchen gardening, skill-based enterprises like carpentry, smithy, etc. and non-agriculture-based enterprises.

### Advantages of Integrated Farming System:

- Higher food production to equate the demand of the exploding population of our nation

- Increased farm income through proper residue recycling and allied components
- Sustainable soil fertility and productivity through organic waste recycling
- Integration of allied activities will result in the availability of nutritious food enriched with protein, carbohydrate, fat, minerals and vitamins.
- Integrated farming will help in environmental protection through effective recycling of waste from animal activities like piggery, poultry and pigeon rearing

- Reduced production cost of components through input recycling from the by-products of allied enterprises
- Regular stable income through the products like egg, milk, mushroom, vegetables, honey and silkworm cocoons from the linked activities in integrated farming

**Integrated Farming System Modules:**

- Inclusion of biogas & agro forestry in integrated farming system will solve the prognosticated energy crisis
- Cultivation of fodder crops as intercropping and as border cropping will result in the availability of adequate nutritious fodder for animal components like milch cow, goat/sheep, pig and rabbit
- Firewood and construction wood requirements could be met from the Agro-forestry system without affecting the natural forest
- Avoidance of soil loss through erosion by agro-forestry and proper cultivation of each part of land by integrated farming

- Generation of regular employment for the farm family members of small and marginal farmers.
- Integrated Farming System Models, or models that use on integration on several aspects of farming, such as cultivation, fishing and livestock rearing, can optimise the productivity of the land, he said. Integrated farming will also be one of the major thrusts.

The integrated farming systems provide scope not only to augment income of the farmers but also bring improvement in soil health through recycling of organic wastes and thereby increase the overall productivity of the farms. The energy obtained from an IFS in various forms is much higher than energy input, as the by- products/wastes of these allied enterprises provide all the raw material and energy required for the food chain in another system. This complimentarily when carefully chosen, keeping in view the soil and environmental conditions, ushers in greater dividends.

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