



# INTEGRATED FARMING SYSTEM

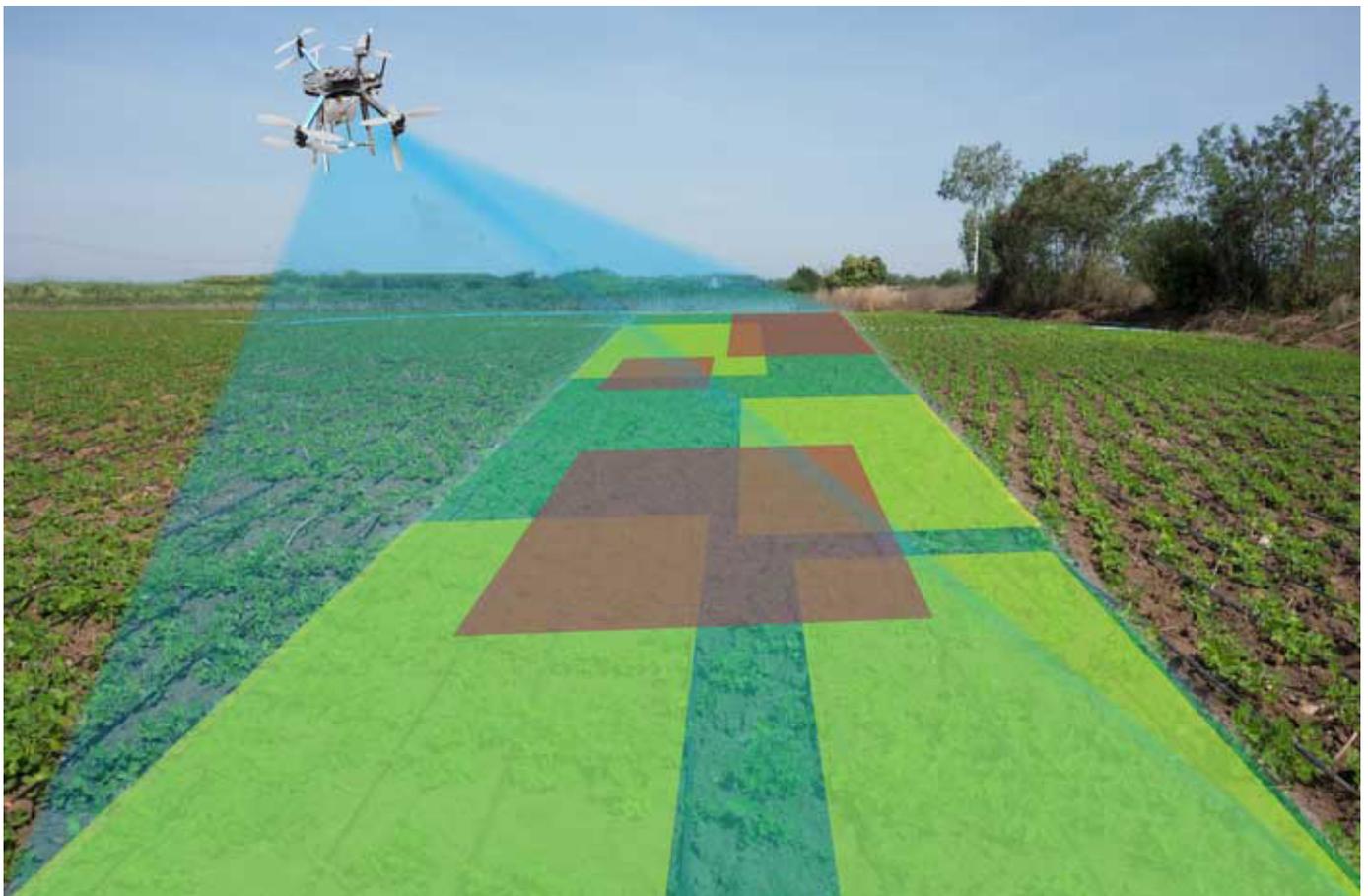
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# INTRODUCTION:

In India, the farmers maintain different enterprises for their complimentary and supplementary nature and for ensuring sustainable livelihood from time immemorial. After the advent of green revolution in late-1960s and economic liberalization in early-1990s, the farmers gradually started focusing on a few enterprises due to several imposing factors including shrinking farm sizes, fluctuating commodity prices, livelihood diversification and shortage of labour during peak agriculture season. It had a severe impact on food and nutritional security of millions of poor farm households. The anguish of farmers is often expressed in terms of their agitation in one or the other part of the country, unwillingness to continue farming and increasing demands of compensating their economic loss. Although suggestions

are pouring in from experts and leaders of organisation for strengthening the income base of farmers, the government cannot implement them entirely due to compulsions from socio-economic and political considerations. However, the Government of India has made an announcement about Doubling Farmers' Income by 2022. Experts are judging the options and strategies for achieving this enviable target. One of the options is to evaluate the potential of age-old integrated farming system (IFS) in enhancing income of farm families within the reasonable time period.



# WHAT IS INTEGRATED FARMING SYSTEM?

An integrated Farming System (IFS) is also defined as a biologically integrated farming system that 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, sustains farm income, eliminates or reduces sources of present environment pollutions generated by agriculture and sustains the multiple functions of agriculture.

Integrated Farming System is a mix of farm enterprises such as crop, livestock, aquaculture, poultry, sericulture and agro-forestry to achieve economic and sustained agricultural production through efficient utilization of resources.



# OBJECTIVES AND CHARACTERISTICS OF INTEGRATED FARMING SYSTEM:

- ✓ Efficient recycling of farm and animal wastes
- ✓ Minimizing the nutrient losses
- ✓ Maximizing nutrient use efficiency
- ✓ Adoption of efficient cropping systems and crop rotations
- ✓ The complementary combination of farm enterprises.
- ✓ Generally, farmers take more than one enterprise on their farms.
- ✓ The main objective of farming is to get maximum profit with minimum expenditure by combining enterprises.
- ✓ The combination of enterprises on a farm is influenced by the relationship that exists between the enterprises.
- ✓ To identify the existing farming systems in a specific area and assess their relative viability.
- ✓ To formulate a farming system model involving main and allied enterprises for the different farming systems.
- ✓ To ensure optimal utilization and conservation of available resources and effective recycling of farm residue within the system.
- ✓ To maintain a sustainable production system without damaging resources based on the environmental system.
- ✓ To raise the overall profitability of farm households by complementing main allied enterprises with each other, etc

## COMPONENT OF IFS:

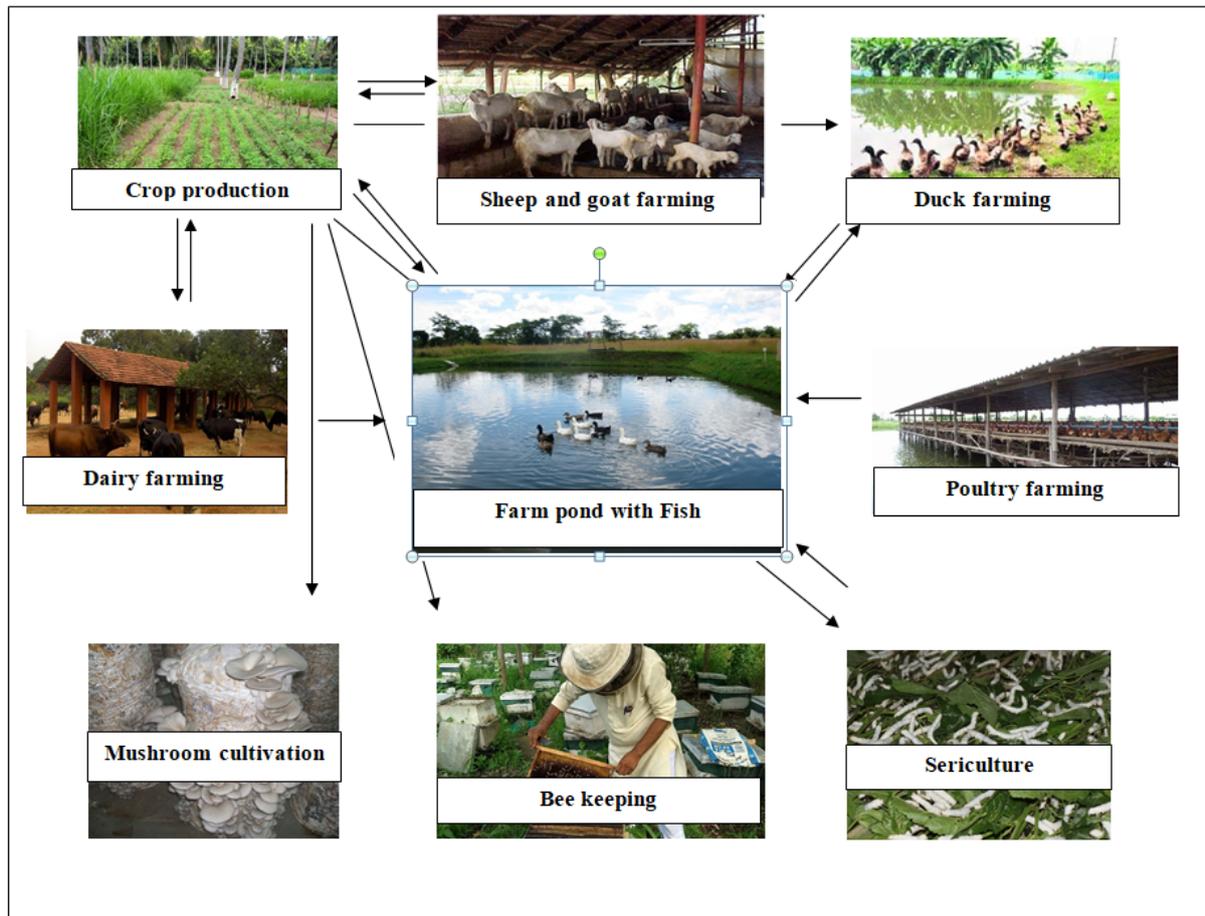
- ✓ Crop production
- ✓ Dairy farming
- ✓ Poultry farming
- ✓ Sheep and goat farming
- ✓ Aquaculture (Fish farming)
- ✓ Duck farming
- ✓ Sericulture
- ✓ Mushroom cultivation
- ✓ Bee keeping

### INTEGRATED FARMING

Integrated Farming System Components



# INTEGRATED FARMING SYSTEM (IFS) MODEL



## DIFFERENT COMPONENTS OF INTEGRATED FARMING SYSTEM (IFS)

How all component integrated used to each other

### 1. Crop production

- a. Horticultural crops
- b. Agricultural crops
- c. Fodder crops

Fodder crops are consumed by cattle in turn cattle dung is used as manure for crops. Straw of paddy is used for mushroom cultivation. Fodder crops are used to raising livestock and poultry or as fish feed. The pond silt becomes rich in nutrient due to ongoing fish culture and this is utilized as fertilizer.

## 2. Dairy farming

Dairy component of the system should be functionally interlinked to the crop cultivation by utilizing the crop residues and weed biomass as feed/fodder for the dairy cattle and the by-product of the dairy through vermicomposting should be utilized as manure for crop cultivation. Farm yard manure as a component of integrated nutrient management, enhance the soil health and improve the productivity of the crops in rice based cropping system. Vermi-compost (Cow dung + crop residues + weed biomass decomposed by earthworm)

The residues and by-products produced from crop cultivation and dairy husbandry should be quantified and efficiently utilized after decomposing through suitable earthworm species suitable for saline ecosystem. Earthworm species which are efficient under saline environment should be identified and used for composting.

## 3. Fish farming

Integrated fish farming systems utilize the organic waste of live stock, poultry and agriculture by-products for fish production. The organic waste to the tune of 40-50 kg is converted into one kg of fish. The pond silt becomes rich in nutrient due to ongoing

fish culture and this is utilized as fertilizer for fodder crops for raising livestock and poultry or as fish feed.

Pisciculture with stocking density of 7500 numbers per hectare in the ratio of 4:3:3 (Catla, Rohu and Mrigal) may be followed. Fish pond should be integrated to other enterprises like duckery, poultry, sheep and goat farming, dairy etc.. Pond silt can be directly used as a base manure for fodder crops. Integrating fish and cow farming reduces the necessity to purchase fertilizers and fish feeds, and increases the income generated by the fish farm. Fresh animal manure can be applied directly to the fish ponds. Fresh manure thus enters the ponds directly, and energy losses as a result of processing and transportation are avoided. Livestock feeds that are not fully digested can be directly utilized by the fish. The number of animals should be compatible with the pond area.

## 4. Duck farming

Ducks are integrated with the pisciculture in the pond. A duckshed/platform is to be made on the bond or inside the pond for resting during night and other occasions. During day time the ducks utilize the pond. Droppings of the duck act as a feed for fishes. The effect



of aeration due to the movement of ducks in the pond water enhance the growth of fishes. Fish ponds provide ducks with an excellent, essentially disease-free environment. Ducks consume juvenile frogs, tadpoles, and dragonfly larvae, thus eradicating many predators of fry and fingerlings. Furthermore, the protein content of these natural food organisms of duck is high. Therefore, duck raising in fish ponds reduces the demand for protein in duck feeds. Khaki Campbell or any other proven breed should be adopted. Duckery unit generate additional income to the farming family.

### 5. Poultry farming

An economically viable, simple and well tested poultry-fish integration utilizes poultry droppings of fully built-up poultry litter recycled into fish ponds with fish production levels of 4.5-5.0 t fish ha<sup>-1</sup>. Broiler production provides immediate returns to the farmers. It is essential to study the market demand of the products which will be available for sale, before taking up the venture. Success of the system depends mainly on the efficiency of farmers, his experience, aptitude and ability in the management of the flock.

This involves procurement of good live stock, housing, feeders water trays and management practices, which also include prevention and control of diseases. The left over animal feeds and excreta is utilized to enhance the biological productivity of water. The poultry litter is applied to the pond in daily doses and is deferred on the days when algal bloom appears in the pond. One adult chicken produces about 25 kg of compost (poultry manure) in one year, 1000 birds would provide “sufficient litter for fertilization of 1 ha water body.

### 6. Sheep and goat farming

Goat farming is an age-old practice but its integration with fish farming has not been explored. The solid excreta of goats are several times richer in nitrogen content and phosphoric acid than the excreta of other animals. Goat urine is equally rich in both nitrogen and potash. Goat droppings have the advantage of direct application into grow-out fish ponds as the size of droppings is of around 6-7 mm pellet, coated with mucus and floats in semi dried state. The droppings have been observed to be consumed by





the fish. Goats can be kept under a house constructed on the elevated portion of the dyke for facilitating the waste disposal into the ponds.

### **7. Mushroom cultivation**

Paddy straw is abundantly available in coastal areas, which should be utilized for mushroom cultivation. Low cost house to be constructed for growing paddy straw mushroom, which provide additional income to the farm family. The utilized straw can be used as compost for field crops and vegetables.

### **8. Sericulture**

In fish-cum sericulture system, pupae are used as fish feed, while worm faeces and wastewater from silk extraction processing plants are used as pond fertilizers. Thus a complete recycling of waste is achieved in these systems.

### **9. Bee keeping**

Bee keeping is one of the most important agro-based industries which does not require raw material from the artisan like other industries. Nectar and pollen from flowers are the raw materials which are available in plenty in nature. The most important source of nectar and pollen are maize, great millet, bulrush, sunflower and palm.

# 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 dairy, sheep and goat and poultry farming.
- ✓ Reduced production cost of components through input recycling from the byproducts of allied enterprises
- ✓ Regular stable income through the products like egg, milk, fish, meat, mushroom, vegetables, honey and silkworm cocoons from the linked activities in integrated farming
- ✓ 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 etc.
- ✓ Generation of regular employment for the farm family members of small and marginal farmers.

## DISADVANTAGES OF IFS

Some disadvantages of integrated farming system are given below:

- ✓ Heavy investment is Required in initial stage.
- ✓ Lack of awareness.
- ✓ Lack of knowledge.
- ✓ High knowledge and skill are required.
- ✓ Involvement of multi-disciplinary activities.

## CONCLUSION

Integrated Farming System is a promising approach for increasing productivity and profitability through recycling the farm and animal wastes and efficient utilization of available resources. Further it generates employment opportunities to the farming communities round the year and provide a better economic and nutritional security. It also maintains environmental quality and ecological stability.

