

Integrated farming System- A Way to Increase Farmer's Income

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Introduction

Integrated farming system is a system where agriculture can be integrated with livestock, poultry and fish, which are maintained at same place to generate employment around the year and also get additional income. It is based on the concept that 'there is no waste' and 'waste is only a misplaced resource' which means waste from one component becomes an input for another part of the system. It is a very useful tool for enhancing farmer's profit.

Objectives of Integrated Farming System-

- ❖ **Enhancing productivity per unit area** - IFS provides an opportunity to increase economic yield per unit area per unit time by intensification of crop and allied enterprises. Time concept by crop intensification and space concept by building up of vertical dimension through crops and allied enterprises are the ways to increase the productivity.
- ❖ **Providing nutritional security to farm households-** In IFS, we link components of varied nature enabling to produce different sources of nutrition from same unit area. This will provide an opportunity to solve the malnutrition problem that exists in the diet of average Indian.
- ❖ **Proper waste management-** It reduces production cost of components through input recycling from the by-products of allied enterprises. The recycling of wastes for production helps to avoid piling of wastes and consequent pollution.
- ❖ **Generation of continuous income round the year-** There is also regular stable income through the products like egg, milk, mushroom, vegetables, honey and silkworm cocoons from the linked activities in integrated farming.
- ❖ **Reducing use of chemicals-** In IFS the waste product of one enterprise is used as the input of other enterprise which helps to reduce the use of chemicals.
- ❖ **Reduce pest attack-** The IFS model reduces weeds, insect pests and diseases through appropriate crop rotation.
- ❖

Different components of Integrated Farming System-

- Agricultural Crops
- Dairy
- Piggery
- Poultry
- Duckery
- Fishery
- Plantation crops
- Apiary
- Mushroom Cultivation
- Vermicomposting
- Fruit cultivation

Different Models of Integrated Farming System-

Model 1: Dairy + Fisheries + Agriculture crops

Model 2: Agriculture + Horticulture + Poultry + Fishery.

Model 3: Agriculture + Horticulture + Poultry + Fishery + Mushroom.

Model 4: Dairy +Agriculture + Poultry

Dairy-Fishery Interaction

- ✓ Cow dung acts as an excellent pond fertilizer and some fish feeds directly on the Cow dung. It's also increase Phytoplankton in pond which are the feed of fishes.
- ✓ Pond water is also used for cattle rearing. (Bathing of Cattles)

Agriculture-Fishery Interaction

- ✓ Pond water used to irrigate the Agricultural land.
- ✓ Grains and brans are used for fish feed.

Dairy –Agriculture Interaction

- ✓ Cow Dung is also used to prepare Vermicompost which are an excellent fertilizer for agricultural crops.
- ✓ Straws of crops are the feed of the cattles.
- ✓ Straws of paddy used as bedding of dairy.

Poultry-Agriculture Interaction

- ✓ Poultry litter is used as a fertilizer to the agricultural feed which contains 4.55-5.46% nitrogen, 2.46-2.82% phosphorus, 2.02-2.32 % potassium and other essential nutrients.
- ✓ Grains of Maize and rice are used as feed of poultry.
- ✓ Straws of paddy used as bedding of poultry.

Poultry-Fishery Interaction

- ✓ Poultry excreta is used as a fish feed.
- ✓ Water of pond is used for washing the poultry house.

Sustainability of IFS

Sustainable development in agriculture must include integrated farming system (IFS) with efficient soil, water crop and pest management practices, which are environmentally friendly, and



cost effective (Walia and Kaur 2013) Nutrient recycling within the system advocates the self-sustainability of the system and which will not only reduce the dependency on the external inputs viz, seed/ fertilizers etc. but also provide the balanced and rich nutrition to the farm family with reduced cost of cultivation and increased profit margin on the same piece of land which is key factor for taking care of sustainability On any farm, four natural ecosystem processes like energy flow, water cycle, mineral cycle and ecosystem dynamics work (Sullivan 2003). These four ecosystems processes function together, complementing each other as sustainable agriculture requires system approach (Singh et al. 2009) and system implies a set of agricultural activities organized while preserving land productivity and environmental quality and maintaining a desired level of biological diversity and ecological stability.

Advantages of IFS-

- **Increase Farm Income-** Different findings revealed that the practicing of IFS increases 2-3 times farm income on an average over practicing single enterprise. About 1838% increase in net income was recorded in Crops + pigeon + buffalo + agroforestry + farm pond (Shekinah & Sankaran, 2007) over monocrop/single enterprise.
- **Reduces the risk-** The specialized agriculture practices and mono-cropping increased production cost, risk of crop failure, and lower market price (Manjunath et al.,2017). In this scenario, IFS will be a solution to reduce the economic risk. Because presence of different crop and enterprise acts as a insurance where the loss for one enterprise can be met up by others.
- **Employment Generation-** IFS increase the employment generation for its continuous labour requirement for multiple crops and livestock management. This holds good even during the COVID-19 pandemic for meeting the employment needs of reverse migrants (urban to rural).
- **Improve soil health and reduce pest attack -** Crop rotation and inclusion of pulse crops in cropping sequence and use of on farm organic materials as a input of crop production improves the soil health and crop rotation helps to minimize the pest and weed infestation.
- **Waste management and Climate resilience-** The IFS systems of small and marginal farmers are relatively less depending on purchased inputs due to higher recycling of waste product as in IFS the waste product of one enterprise used as a input of other enterprise. This



implies smallholder mixed farms can be less vulnerable to climate change and crop failure due to higher diversity of farm by-products. The IFS systems from Palampur, Johrat, Kalyani, Raipur, and Telangana reported net negative emission of GHG emission due to higher carbon sequestration.

- **Food and nutritional security-** The well-integrated complementary IFS systems provide dietary needs of farm families partially or fully from a small piece of land. Such systems form the future of the Indian agriculture system and help to provide most of the staples consumed by many millions of small and marginal farmers in India, as IFS offers scope to utilize land and time for growing short-duration vegetable crops, pulses, and fodder for livestock. These systems are very critical for achieving future food and nutrition for the burgeoning Indian population.

Limitations for adopting IFS

Despite of several advantages there are some limitations to adopt IFS like-

- 1) High initial investment for the establishment of animal shed, purchasing of livestock, etc. Further, biophysical constraints for adoption the IFS systems like non-availability of quality planting material, lack of skills and knowledge of new crops such fodder formed the major constraints in adopting the crop-livestock system.
- 2) Farmers are resistance to change their conventional practice.
- 3) IFS provides higher yields but lower absolute levels of marketable produce raise questions about the sustainability of their livelihoods.

Conclusion

- It is very essential to create a database on IFS throughout the country in relation to type and size of integrated farming systems, enterprise selected and their way of allocation, infrastructure, economics, economic sustainability of the system etc. under different ecological situations
- Development of location specific low-cost viable IFS models which are socially acceptable.
- Training and awareness among the farmers are required to increase the popularity of Integrated Farming system



References

- Balusamy, M., Shanmugham, P. M., & Baskaran, R. (2003). Mixed farming an ideal farming. *Intensive Agric*, 41(11-12), 20- 25.
- Gill, M. S., Singh, J. P., & Gangwar, K. S. (2009). Integrated farming system and agriculture sustainability. *Indian Journal of Agronomy*, 54(2), 128- 139.
- Manjunath, B. L., Paramesh, V., Mahajan, G. R., Das, B., Reddy, K. V., Chakurkar, E. B., & Singh, N. P. (2017). Sustainability through resource recycling, soil fertility and carbon sequestration from integrated farming systems in west coast India. *The Bioscan*, 12, 1- 6.
- Shekinah, D. E., & Sankaran, N. (2007). Productivity, profitability and employment generation in integrated farming systems for rainfed vertisols of western zone of Tamil Nadu. *Indian Journal of Agronomy*, 52(4), 275- 278
- Singh et. al. (2009) Sustainable farming for tropics in: sustainable agriculture. Issues and prospective vol 1 (Ed) R.P. Singh. Indian Society of Agronomy IARI New Delhi pp. 69-89.
- Sullivan P. (2003) *Agricultural Economics Research Review* 22 (January-June): 129-38.

