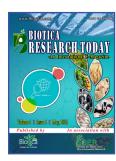
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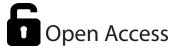
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# Integrated Farming System: A Way towards Climate Resilience

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#### Abstract

Vertical expansion through integration of appropriate farming components is the only way out for economic and sustainable crop production. IFS may be defined as linking together of two or more normally separate enterprises into a whole farming system. NATP broadly delineated the agro-ecosystem of India into 5 zones: rainfed, irrigated, coastal, arid and hill and mountain, farming system models are established based on agro-ecological situations, socioeconomic settings, *etc.* The resource-saving practices involved in IFS are profitable and sustainable besides minimizing the negativities and risks associated with intensive cropping. Thus, IFS should be popularised among farmers.

### Introduction

The average sizes of landholdings have declined from 2.28 ha in 1970-71 to 1.08 ha (2021). With the growing population and shrinking resources, horizontal expansion of cropping area is no more feasible, vertical expansion through integrating appropriate farming components is essential for economic and sustainable crop production. Integrated Farming System (IFS) is an integrative whole farm approach and effective in solving the problems of small and marginal farmers through boosting employment and income by integrating various farm enterprises and recycling crop residues.

# **Concept of IFS**

FS may be defined as linking together of two or more normally separate enterprises which then become subsystems of a whole farming system. Two major features of IFS are: (1) waste or by-product utilization in which the wastes or by-products of one subsystem become an input to a second subsystem; and (2) improved space utilization in which the two subsystems essentially occupy part or all of the space required for an individual subsystem (Behera and France, 2016). An ideal IFS would satisfy five basic conditions: (1) economic feasibility; (2) nutritional security; (3) environmental sustainability; (4) energy self-sufficiency; and (5) climatic adaptability (Behera *et al.*, 2015).

# **Goals of Integrated Farming System**

The four primary goals of IFS are:

1. Maximization of the yield of all components to provide steady and stable income.

2. Rejuvenation of the system's productivity and achieve agro-ecological equilibrium.

3. Avoid the build-up of insect-pests, diseases and weed populations through natural cropping system management and keep them at a low level of intensity.

4. Reducing the use of chemicals to provide chemical-free • Sustai nability: Organic supplementation through effective healthy produce and environment to the society (Manjunatha utilization of by-products of linked components, sustain the et al., 2014). potential of the production base for much longer periods. • Balanced food: Components of a varied nature are linked IFS based of Agro-Ecosystems of India to produce different varieties of products and produce, which ccording to National Agricultural Technology Project serve to provide a balanced diet for the farm family. (NATP), India has been broadly delineated into 5 agro-• Resource recycling: Effective recycling of waste materials ecosystems: rain-fed, irrigated, coastal, arid, and hill and by-products lowers reliance on outside inputs stabilizing and mountain. The farming system in one agro-ecosystem production. differs from another depending upon agro-ecological situations, socio-economic settings, etc. Thus, suitable IFS for • Income year round: IFS provides a flow of money for the different agro-ecosystems are mentioned below in table 1. farmers throughout the year by way of the sale of a variety of farm produce (e.g., milk, egg, mushroom, vegetables, fruits,

## Advantages of IFS

• *Productivity*: IFS increases economic yield per unit area per unit time by virtue of intensification of crop and allied enterprises.

*Risk minimization*: Diversification of crops and enterprises

helps in risk minimization and offers resilience to climate change.

Table 1: Suitable IFS models under different Agro-ecosystems of India

Agro-ecosystem	Suitable Integrated farming systems	
Rainfed Agro-Ecosystem	(Lucaena + Cenchrus/ Acacia Se	<ul> <li>/ Pearl Millet + Cowpea) + Sheep/ Goat + Trees/ grass fodder enegal/ Prosopis cineraris).</li> <li>+ pulses) + Sheep/ Goat + Dryland horticulture (ber, custard</li> </ul>
Irrigated Agro-Ecosystem		inger millet) + Cattle + Mushroom cultivation. -cotton/ rice-rice-maize) + Poultry + Fish ng + Vegetable farming
Coastal Agro-Ecosystem	<ol> <li>Cropping (Rice-Rice-Maize/ carp) + Poultry + Mushroom Cu</li> <li>Rice + Fish + Poultry - Cowp</li> </ol>	
Arid Agro-Ecosystem	<ol> <li>Diversified cropping (pearl millet + greengram + clusterbean) + Tree/ grass (<i>Prosopis cineraria, Cenchrus ciliaris</i>) + Sheep/ Goat.</li> <li>Agri-horticulture (Ber + Pearl millet/ Cluster bean) + Boundary plantation (<i>Acacia senegal, Hardwickia binata</i>) + Cattle (Tharparkar).</li> <li>Silvi-pasture (<i>Hardwickia binata/ Ailanthus excels</i>) + Horti-pasture (<i>Ziziphus rotundifolia/ Ziziphus mauritiana + Cenchrus ciliaris</i>) + Goat/ Sheep.</li> </ol>	
Hill and mountain Agro- Ecosystem	<ol> <li>Poultry + Crop (Rice/ Maize + Soybean/ Mustard) + Fish + Duck + Horticulture.</li> <li>Crop (Maize/ Wheat/ Rice+ Vegetables) + Fish + Poultry + MPTs (<i>Dalbergia sissoo, Melia azedarach, Eucalyptus hybrid, Eulaliopsis binata</i>).</li> <li>Crop (Cereals + Oilseed/ Pulses) + Fish + Goat + Bamboo + MPTs (<i>Acacias, Leucacena leucocephala</i>).</li> </ol>	
Concle	usion	Future Thrust

The resource-saving practices involved in IFS are profitable and sustainable besides minimizing the negativities and risks associated with intensive cropping. It improves environmental conditions and reduces reliance on external inputs and conserves resources. Farmers are able to uplift productivity through optimal resource utilization and waste matter recycling. Thus, popularisation of IFS should be promoted and any help needed for its successful adoption should be extended to farmers.

• Development of low cost, location specific	, viable and
socially acceptable IFS models for varied land	nolding sizes
are required.	

• Module development on the basis of farmer's need through on-farm testing is necessary by substituting lower profitable components with higher ones, depending upon choice of the farmers and availability of market.

• Inclusion of high value crop according to different agro-



ecosystem can help in the sustainability and profitability of the IFS modules.

• There is necessity to evaluate soil nutrient dynamics, carbon sequestration and organic resource recycling with different systems over the long run.

• Drafting policy for its promotion and awareness at large scale with small financial aids through loans or subsidy.

#### References

Behera, U.K., Babu, A., Kaechele, H., France, J., 2015. Energy self-sufficient sustainable integrated farming systems for

livelihood security under a changing climate scenario in an Indian context: a case study approach. *CAB Reviews* 10(19), 11.

- Behera, U.K, France, J., 2016. Integrated Farming Systems and the Livelihood Security of Small and Marginal Farmers in India and Other Developing Countries. *Advances in Agronomy* 138, 235-282.
- Manjunatha, S.B., Shivmurthy, D., Sunil, A.S., Nagaraj, M.V., Basavesha K.N., 2014. Integrated Farming System - An Holistic Approach: A Review. Research and Reviews: Journal of Agriculture and Allied Sciences 3(4), 30-38.

