

Integrated Farming System for Sustainable Livelihood

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ARTICLE ID: 035

Summary:

Owing to burgeoning population, industrialization and urbanization, agriculture land is dwindling day by day resulting in smaller land holdings causing decrease in profit from traditional cropping system. To surmount this difficulty of small land holding and decreased margins, integrated farming system approach (IFS) can be a viable option. IFS considered as one farm unit with components such as crops *vis-a-vis* animal husbandry, agro-forestry, horticulture, bio-gas plant, mushroom production, kitchen gardening, poultry production, sericulture etc., which are interlinked together towards better farming. It is considered as a noble concept of producing sustainable crop yield as well as maintaining ecological balance simultaneously. This system provides medium sized farm family a year round supply of nutritious food enriched with carbohydrate, protein, fat, vitamins etc. A year round income by selling the different outcomes of varied components of IFS model is also attained besides maintaining the food and nutritional security. In present situation of small holdings it is quite successful concept in doubling the farmers' income in spite of crops production alone.

1. 'Integrated farming system approach' - the need of the hour

Ever increasing population coupled with urbanization, progressive income in developing countries is fuelling a substantial global increase in the demand for food under shrinking cultivable land. During last few decades, the objective of farming has changed rapidly, and often with little warning. Remarkable price swings in agricultural commodities, high end quality standard, new environmental regulations, the argues surrounding genetically modified crops, severe climatic events, the demand for energy crops, the revision of the Common Agricultural Policy and the consequences of the financial crisis all create uncertainty regarding future goals to achieve potentials. In such turbulence, a one-sided focus on efficient production is no longer a requirement but farmers also need to cope with unexpected climatic events and to adapt new developments (Pramanick *et al.*, 2018). Integrated farming system



approach (IFS) consists of crop cultivation, animal husbandry, horticultural production, agro-forestry, fishery, biogas unit, mushroom production, duck rearing, apiculture and other enterprises as new development strategies for the small farmers concerning their sustainable livelihood. A system approach is the need of the hour to fulfil the demand of ever increasing population without disturbing the ecological balance. These various enterprises in IFS are not only supplementing the income of farmers but also assist in augmenting employments of the family labour. The integrated farming system approach brings an alteration to the farming practices focusing sustainable production in the annual cycle of cropping system while taking care of suitable and efficient utilization of farm resources. Generally, the farm wastes are recycled for productive purposes in the IFS. Every individual farms have their own definite descriptions occurring from variations in resource endowments to family circumstances. A farming system consists of the household, their resources as well as resource channel where these entire components are integrated together in a sustainable manner. A farming system is defined as 'a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate'. Endeavouring to fight against hunger and poverty, developing countries are countenancing the challenges to spot specific agricultural and rural development needs and open opportunities, and speculation over these areas where the greatest impact on food security and poverty could be achieved. The demarcation of farming systems gives a useful outline containing suitable agricultural development strategies and interventions, as by definition, they cluster farm households with similar characters and limitations. Only in limited numbers the systems are delineated within each region leading inevitable degree of heterogeneity within any single system. However, the alternative of identifying numerous, discrete, micro-level farming systems in each developing region would detract from the overall impact of the analysis. The key factors of classifying farming systems are: (i) the existing natural resource base; (ii) the dominant pattern of farm activities and household livelihoods, including relationship to markets; and (iii) the intensity of production activities. These criteria were mostly applied to each of the regions of the developing world (Hall, 2001).

2. Principles of integrated farming system

A farming system follows basic principles viz., cyclic, rational and ecologically sustainable. The farming system is a fundamentally cyclic where organic resource, livestock, land and crops are linked mutually in a cyclic compartment (fig. 1). Hence, management decisions related to one component may influence the others. Using crop residues more rationally is an important route out of poverty. For resource-poor farmers, the correct management of crop residues, together with an optimal allocation of scarce resources, leads to sustainable production. Combining ecological sustainability and economic viability, the integrated livestock-farming system maintains and improves agricultural productivity while also reducing negative environmental impacts.

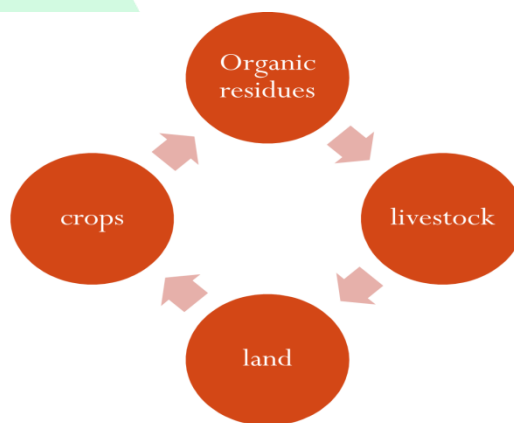


Fig. 1: Cyclic manner of an integrated farming

3. Importance of integrated farming systems

The relevance of IFS unit in any locality as model farming system is as following:

- IFS facilitates farm household to produce higher food in a sustainable approach to satisfy the need of the burgeoning population. It's a complete solution of food security and nutritional benefits of the family owing to the diversification in cropping system. Amalgamation of allied components will ultimately result in the accessibility of nutritious foods that are enriched with carbohydrate, protein, fat, minerals and vitamins.
- Farm income is also escalated through proper residue recycling and allied components. It will endow with regular and stable income through the varied products like milk, egg, mushroom, seasonal as well as off-season vegetables and honey from the linked activities in an integrated farming model.
- An IFS model promotes recycling of organic waste in the system which will increase soil fertility and productivity. Recycling of waste generate in animal rearing like

piggery, poultry and pigeon rearing not only reclaim soil fertility but also these practices will help in maintaining the ecological balance.

- Production cost of each component is reduced through input recycling from the by-products of allied enterprises.
- Prognosticated energy crisis will be solved by including biogas and agro-forestry in integrated farming system.
- Cultivation of fodder crops as intercropping or border cropping will result in the availability of adequate nutritious fodder for animals such as 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 run-off in agro-forestry and silvi-pastoral management in integrated farming.
- Generation of regular employment for the farm family members of small and marginal farmers.



Fig. 2: Advantages of IFS

4. Broad categories of farming system

- Farming systems under irrigated ecosystem, taking up a broad range of food as well as cash crop production;
- Farming systems under wetland rice based ecosystem, completely reliant upon seasonal rains in addition with life saving irrigation only;
- Farming systems in rainfed humid areas, categorized by particular important crops or mixed crop-livestock systems;
- Farming systems in steep and highland areas under rainfed ecosystem, which are often mixed crop-livestock systems;
- Farming systems in dry or cold low potential areas under rainfed ecosystem, with mixed crop-livestock and pastoral systems merging into systems with very low current productivity or potential because of extreme aridity or cold;
- Dualistic (mixed large commercial and small holders) farming systems, across a variety of ecologies and with diverse production patterns;
- Coastal artisanal fishing systems, which often incorporate mixed farming elements; and
- Urban based farming systems, typically focused on horticultural and livestock production.

All the above mentioned farming systems are primarily dominated by smallholder agrarian community except for the dualistic systems. The key differentiating attributes of such farming systems are, notably: (i) accessibility of water source, e.g. irrigated, rainfed, moist, dry; (ii) climate, e.g. tropical, temperate, cold; (iii) landscape, e.g. highland, lowland; (iv) size of farm, e.g. small, marginal, large scale; (v) intensity of production, e.g. intensive, extensive, meagre; (vi) dominant livelihood source, e.g. cereals, pulses, root crop, tree crop, artisanal fishing, pastoral; (vii) dual crop livelihoods, e.g. rice-wheat, cereal-root, cereal-oilseed, cereal-pulse coupled livestock; and (viii) location, e.g. hill based, forest based, coastal, urban based etc.

Conclusion:

Integrated farming system is the need of the hour to increase farm income and ensuring a year-round return to the farm family. It also ensures the nutritional security to the farm family. Country like India, where the majority of the farming community falls under small



and marginal group, there IFS has got its significance more. The most important concern is to select suitable component for the farming system for sustainable livelihood security.

References

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