



# NEW ERA AGRICULTURE MAGAZINE

## Integrated Farming Systems: A Sustainable and Profitable Approach for Small and Marginal Farmers

Neha Kumari

### ABSTRACT

Farming is an age-old practice for survival of human beings, communities and societies. People who started farming understood the interaction of various components of farming and developed farming systems in harmony with Nature and the prevailing agro-ecosystems. But integration of all the individual farm enterprises is needed to exploit the synergistic effect on production of all units, achieving sustainability and efficient use of on-farm resources. IFS can be seen as a better option for small and marginal farmers as IFS can utilize family labour well, and provide continuous income, provide for diverse needs of farm household. There is a need for agricultural scientists and technicians to move beyond their discipline boundaries and think and act like a small farmers and train farmers to practice IFS on their small farms.

### Introduction:

In India, small and marginal farmers own 86.21 percent of the country's total land holdings (Agriculture census, 2015-16). All the small farmers use their meagre resources only to grow enough to feed their families as they practice farming as a source of livelihood for subsistence and survival. Generally, they suffer from resource inadequacy coupled with risks and uncertainties in farming. To sustain and satisfy as many of their needs as possible, small farmers include crop production, livestock, poultry, fisheries, beekeeping etc., as isolated individual farm enterprises to earn additional incomes. But farming is understood as system in which a complex interrelated

natural processes occur among various resources of soils, plants, animals, implements, power, labour, capital and other inputs controlled in part by farming family and influenced by social forces and economic concerns that operate in the community, markets and society at large.

### Concept of Farming System

An agricultural system is man-made system, embedded in the natural and social systems. It is defined as “an assemblage of components which are united by some form of interaction and interdependence” (Mc Connell and Dillon, 1997). Farming system is the process of harnessing the solar energy in the form of economic plant and animal products.

*Neha Kumari*

*<sup>1</sup>Ph.D. Scholar, Department of Extension Education, Bihar Agricultural University, Sabour, Bihar*

System implies a set of inter-related processes organized into a functional entity. Thus farming system designates a set of agricultural activities organized into functional units to profitably harness solar energy maintaining desirable level of biological diversity and ecological stability. Thus, farming system refers to the farm as an entity of inter-dependent enterprises carried out on the farm. Farming system is an approach where in risk in dealing with single component can be managed through effective recycling. (Radder, 1997).

Farming system has been further explained as a complex interrelated matrix of soils, plants, animals, implements, power, labour, capital and other inputs controlled in part by farm family and influenced by social forces and agro-climatic conditions of the ecosystem. Any farming system operates in accordance with farm household's needs, goals, priorities, preference and resources. It is a system that is unique and reasonably stable arrangement of family enterprises that the farm household manages in close alliance with physical, biological, ecological, economic and socio-cultural environment. Anonymous (1992).

The farming system conceptually is a set of elements or components that, are inter-related which interact among themselves. At the center of interaction is the farmer

exercising his control and choice regarding the type of activities (Basavaraj, 1999). Farming system takes into account the interactions between the sub systems within a whole farm setting and thus designed to address farmers and society needs and goals. The whole farm is viewed as a system encompassing interacting subsystems. No enterprise is considered in isolation. It looks at the farm family household as a system of natural and human components. (Hosmani, 1999).

Sharma *et al.* (1991) Farming system refers to the farms where in two or more enterprises are integrated with the farm resources with an objective of achieving fuller utilization of available resources to realize maximum profits and also to stabilize returns. It provides an opportunity to utilize the land, labour, water, manure and fertilizers more efficiently. Farming system approach examines the full range of farm activities closely related to one another by the common use of farmer's land, labour capital and management factors

### **Concept of Integrated Farming Systems**

Instead of relying on only growing crops, they can find farming as sustainable and profitable if they could diversify their farming into tending a milch cattle or goats or poultry or ducks they will be able to earn reasonably good incomes. In this process of integrating crop husbandry with animal husbandry and

fisheries, a new farming system emerged, which is called Integrated Farming System (IFS). The emergence of Integrated Farming Systems (IFS) has enabled farmers to try alternative ways of farming to improve the economic feasibility and risk management of small holder farming. Integrated farming system is a commonly and broadly used term to explain the integrated approach to farming as compared to monoculture approaches.

In integrated farming systems, small farmers practice crop production, but also add livestock, poultry, fisheries, beekeeping etc. in their farms in an effort to better utilization of available resources and maximize farm production and farm income. Efforts are made to integrate all components through (i) maintaining good soil health care, (ii) harvesting and efficient use of rain water and ground water, (iii) ecological pest management without causing harm to other farm enterprises and natural ecosystem of the farm, and (iv) efficient post-harvest management and value addition. A sustainable integrated farm also takes care of plant nutrition through composting, farm yard manuring, green manuring, etc. through recycling processes.

Integrated farming system can be defined as a resource management strategy of operating three or four interrelated farm enterprises on a single farm to achieve synergistic effect on economic and sustained

agricultural production to meet diverse needs of the farm household while adopting recycling of on-farm resources and preserving the resource base and maintaining high environmental quality.

### **Objectives of Integrated Farming System**

- Integration of two or more appropriate combination of enterprises like crop, dairy, piggery, fishery, poultry, bee keeping etc., for each farm according to the availability of resources to sustain and satisfy the necessities of the farmer.
- Optimal utilization of resources and enhancing the resource use efficiency by recycling crop residues, animal wastes among the various integrated farm enterprises
- Maximizing farm output from all diversified and integrated farm enterprises and ensuring regular farm income throughout the year
- Maintaining environmental health and taking care of flora and fauna on the farm

### **Features of sustainable farming systems**

Among the various features, the most important are: (i) Enhancing sustainable and stable returns from all enterprises on the farm, (ii) Greater employment generation throughout the year, (iii) Improved productivity and soil

health, (iv) Diversified farm produce and reusable crop residues and wastes, (v) Scope for generating large biomass, crop residues and animal wastes will enhance as these are treated as resources for other farm enterprises and not as wastes. Thus, maintaining stability and sustainability on the farm assume great importance for a farming system.

### **Characteristics of Integrated Farming System (IFS)**

- ❖ IFS is a unique method of educating farmers. The farmers who adopt IFS on a long run will gain knowledge on all aspects and can be a management expert in developing model of high returns.
- ❖ Develop individual farms over a period of time
- ❖ IFS obtain continuous maximum returns
- ❖ Efficient management of all the available resources
- ❖ IFS is a continuous decision making process
- ❖ IFS is a labour intensive technically feasible, environmentally sound, economically viable, and socially acceptable method of agriculture
- ❖ Immediate goal of IFS is increasing net income and ultimate goal is family welfare sustenance.

Integrated farming system is a process that continues for ever as the system of recycling of resources among various units of farm enterprises goes on for maximizing farm returns. IFS is seen as a whole unit with sub-units.

### **Principles involved in Integrated Farming Systems**

Integrated farming systems involve a few principles that help build stability of income, sustainability of yields and efficient use of resources through judicious recycling and support mechanisms. Some of the principles are briefly listed here.

- Better resource use efficiency in multiple farm enterprises
- Regular recycling of resources, crop residues and farm wastes among the sub-systems or farm enterprises.
- Contingency farming for better risk management for small farmers
- Risk management in small farms with different mechanisms of mixed cropping, relay cropping and crop sequencing
- Diversifying income sources to enable farmers live a decent life
- Seasonal income from different sources to meet financial needs for child education, socio-cultural festivals

- Regular daily income for small dairy farmers

### Scope of integrated farming system

Farming enterprises include crop, livestock, poultry, fish, tree crops plantation crops, forestry sericulture etc. A combination of one or more enterprises with cropping, when carefully chosen, planned and executed, gives greater dividends than single enterprise especially for small and marginal farmers. Farm as a unit is to be considered and planned for effective integration of the enterprises to be combined with crop production activity. The integration of farm enterprises depends on many factors such as

- Soil and climatic features of the selected area
- Availability of the resources, land, labour and capital
- Present level of utilization of resources
- Returns from existing farming system
- Economics of proposed integrated farming system
- Managerial skill of the farmer

By adopting integrated nutrition management (INM) and integrated pest management (IPM) integrated farming systems rely more on on-farm resources and reduce consumption of external inputs for both plant nutrition and plant protection. So, over the years, the scope for practicing organic farming increases.

### CONCLUSION

The concept of integrated farming systems has got more relevance in the present day farming to reap better harvests in the long by maintaining a productive resource base on a holistic approach. The IFS approach introduces a change in the farming techniques for maximum production in the cropping pattern and takes care of optimal utilization of resources. The farm wastes are better recycled for productive purposes. A judicious mix of agricultural enterprises like dairying, poultry, mushroom, piggery, fishery etc. suited to the local agro-climatic situations and socio-economic status of farmer would bring in prosperity in the farming (Rangasamy, 1999).

Sanjeev Kumar et al. (2012) have concluded that integrated farming system approach is a location specific, technically skill based, play multi-dimensional role in fulfilling the domestic requirement, employment avenues, rational use of resources, rejuvenation of resources, sustaining productivity, and economic viability of the farming systems.

There is consensus that agricultural research must move beyond the boundaries of disciplines, commodities, experimental farms and laboratories, and embrace system perspective (ICAR, 2000). Hence, regular capacity building of human resources including scientists, technicians, farmers and

farm labour and empowerment of family members for better organizing and management of family farms through integrated farming systems approach.

IFS seems to be answer to the problems of increasing food production, increasing net farm income, improving nutritional status promoting natural resource management, sustainable use of land, water, flora and fauna.

## REFERENCES

Anonymous, 1992, Farming for the future-An introduction to low external input a sustainable agriculture. ILEIA, Netherlands.

Basavaraj, H., 1999, Economic assessment of integrated farming systems, pp. 270-274. In: *Lecture Notes of Summer Short Course on Farming Systems for Sustainable Production*, Univ. Agric. Sci. Dharwad, 24th May to 2nd June 1999.

Government of India. (2019). *RIK (2019). Agriculture Census. 2015-16. All India report on number and area of operational holdings*. Agriculture Census Division, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India. Retrieved from [https://agcensus.nic.in/document/agcen1516/T1\\_ac\\_2015\\_16.pdf](https://agcensus.nic.in/document/agcen1516/T1_ac_2015_16.pdf).

Hosamani, M. M., 1999a, Research-extension linkage in IFS development. pp. 266-269. In: *Lecture Notes of Summer Short Course on Farming Systems for Sustainable*

*Production*, Univ. Agric. Sci. Dharwad, 24th May to 2nd June 1999.

ICAR Vision (2000). Indian Council of Agricultural Research, New Delhi.

Mc Connell, Douglas J. and Dillon, J.L. (1997). *Farm Management for ASIA: a system approach*, FAO, Rome.

Radder, G. D., 1997, Integrated Farming Systems for sustainability in agriculture. In *Lecture Notes of Summer Short Course on Role Organics in Sustaining Soil Fertility and Crop Productivity*. Univ. Agric. Sci. Dharwad 9-18 June, 1997.

Rana S. S. and Pankaj Chopra (2013). *Integrated Farming System*. Department of Agronomy, College of Agriculture, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur, 90 pages.

Rangasamy, A., 1999, In : *Lecture Notes of Summer Short Course on Farming Systems for Sustainable Production*, Univ. Agric. Sci. Dharwad, 24th May to 2nd June 1999.

Sanjeev Kumar, A. Dey, Ujjwal Kumar, N. Chandra and B. P. Bhatt (2012) *Farming System Research Experiences in Indian Context Integrated fish farming* In: (Eds.) B.P. Bhatt, A.K. Sikka, Joydeep Mukherjee, Adlul Islam, A. Dey *Status of Agricultural Development in Eastern India*, pp. 205-230



# NEW ERA AGRICULTURE MAGAZINE

256

Sharma, L. R., Bhhati, J. P. and Singh  
Ranveer, 1991, Emerging farming systems in  
Himachal Pradesh-Key issues in sustainability.  
*Indian J. Agril. Econ*, **46**(3):422-427.

