

INTEGRATED LIVESTOCK FARMING SYSTEMS: SCOPE AND LIMITATIONS (LPM-610)



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Farming System

- ▶ An appropriate mix of farm enterprises and the resources available to the farmers to raise them for profitability.
- ▶ It interacts adequately with environment without dislocating the ecological and socio-economic balance on one hand and attempt to meet the national goal on the other.
- ▶ In its real sense, it will help in lifting the economy of agriculture, livestock and standard of living of the farmers of the country as a whole.

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- Farming system is a resource management strategy to achieve economic and sustained agricultural production to meet diverse requirements of farm livelihood while preserving resource base and maintaining a high level of environment quality.

(Lal and Miller, 1990)

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- ▶ Farming system is a set of agro-economic activities that are interrelated and interact with themselves in a particular agrarian setting.
 - ▶ It is a mix of farm enterprises to which farm families allocate its resources in order to efficiently utilize the existing enterprises for increasing the productivity and profitability of the farm. These farm enterprises are crop, livestock, aquaculture, agro-forestry and agri-horticulture.

(Sharma et al., 1991)

Specialized vs. Integrated Farming System

- **Specialized Farming System (SFS):** Specialization involves the intensification of the agricultural activity aimed at maximization of the production/area/time.
- This involves improvement of operational efficiency and speed of operation/execution at each step.
- The specialized farming system is focused on single cropping system or sequence of farming enterprise like animal breeding, dairying so as to achieve the highest degree of precision management with minimal diversion of resources to diverse crops or enterprises.

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- **Integrated Farming System (IFS):** A component of FSR (Farming System research), 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 in the IFS.
 - Unlike the SFS, IFS's activity is focussed round a few selected, interdependent, interrelated and often interlinking production systems based on a few crops, animals and related subsidiary professions.
 - IFS envisage harnessing the complementarities and synergies among different agricultural sub-systems/enterprises and augmenting the total productivity, sustainability and gainful employment.

Mixed Farming vs. Farming System

	Mixed farming	Farming system
Objective	Subsistence and welfare of mankind	Higher profitability and ecological balance
Emphasis	On gross output	on system

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- **Mixed farming system** consists of components such as crops and livestock that coexist independently from each other.
 - In this farming integrating crops and livestock serves primarily to minimize the risk and not to recycle resources.
 - Enterprises in the **integrated farming system** are mutually supportive and depend on each other.
 - In IFS, crops and livestock interact to create a synergy, with recycling allowing the maximum use of available resources.
 - Crop residues can be used for animal feed, while livestock and livestock by-product production and processing can enhance agricultural productivity by intensifying nutrients that improve soil fertility and reducing the use of chemical fertilizers.
 - A high integration of crops and livestock is often considered as a step forward, but small farmers need to have sufficient access to knowledge, assets and inputs to manage this system in a way that is economically and environmentally sustainable over the long term (**FAO, 2001**).

Concept of Integrated Farming System

- “There is no waste”, and “waste is only a misplaced resource which can become a valuable material for another product” in IFS. **(FAO, 1977)**
- IFS is a mixed farming system that consists of at least two separate but logically interdependent parts of a crop and livestock enterprises. **(Okigbo,1995)**
- According to this concept, integration usually occurs when outputs (usually by-products) of one enterprise are used as inputs by another within the context of the farming system.
- IFS as a mixed animal crop system where the animal component is often raised on agricultural waste products while the animal is used to cultivate the soil and provide manure to be used as fertilizer and fuel.

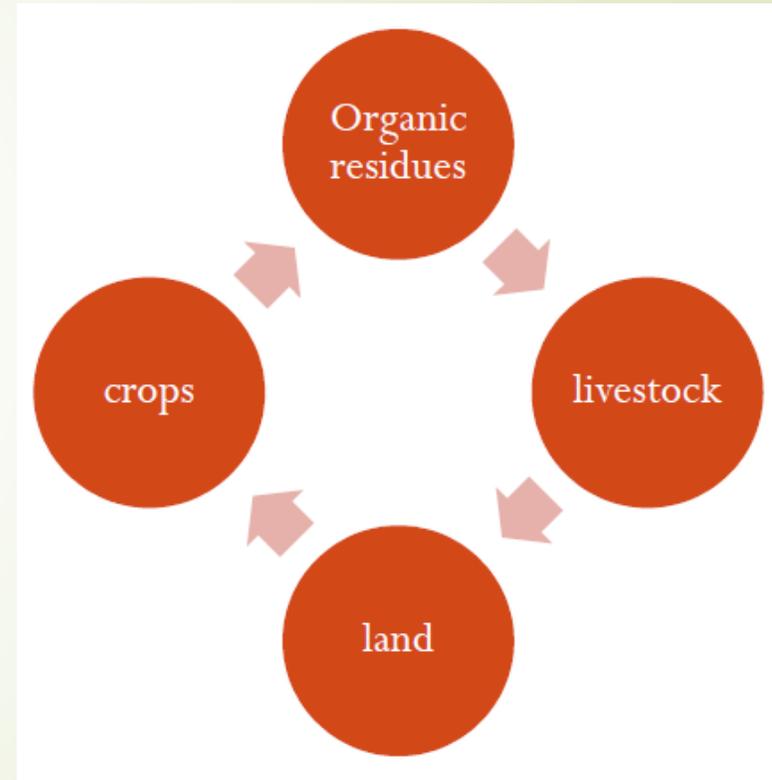


Key principles of integrated farming system

- Cyclic
 - Rational
 - Ecologically sustainable
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Cyclic

- The farming system is essentially cyclic (organic resources – livestock – land – crops).
- Therefore, management decisions related to one component may affect the others.





Rotational

- 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.
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Ecologically Sustainable

- ▶ Combining ecological sustainability and economic viability, the integrated livestock-farming system maintains and improves agricultural productivity while also reducing negative environmental impacts.
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Scope of integrated farming system

- ▶ Farming enterprises include crop, livestock, poultry, fish, sericulture etc. A combination of one or more enterprises with cropping when carefully chosen, planned and executed gives greater dividends than a 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.

Factors influencing Integration of Farm Enterprises

- Soil and climatic features of the selected area.
- Availability of the resources, land, labour and Capital.
- Present level of utilization of resources.
- Economics of proposed integrated farming system.
- Managerial skill of farmers.

Advantages of Integrated Farming System

- **Profitability:** Use waste material of one component at the least cost. Thus reduction of cost of production and form the linkage of utilization of waste material, elimination of middleman interference in most input used. Working out net profit B/ C ratio is increased.
- **Potentiality or Sustainability:** Organic supplementation through effective utilization of by products of linked component is done thus providing an opportunity to sustain the potentiality of production base for much longer periods.

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- **Balanced Food:** We link components of varied nature enabling to produce different sources of nutrition.
 - **Environmental Safety:** In IFFS waste materials are effectively recycled by linking appropriate components, thus minimize environment pollution.
 - **Recycling:** Effective recycling of waste material in IFFS.
 - **Income Rounds the year:** Due to interaction of enterprises with crops, eggs, milk, mushroom, honey, cocoons silkworm. Provides flow of money to the farmer round the year.

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- **Adoption of New Technology:** Resources farmer (big farmer) fully utilize technology. IFS farmers, linkage of dairy/mushroom/sericulture/vegetable.
 - Money flow round the year gives an inducement to the small/original farmers to go for the adoption technologies.
 - **Saving Energy:** To identify an alternative source to reduce our dependence on fossil energy source within short time.
 - Effective recycling technique the organic wastes available in the system can be utilized to generate biogas. Energy crisis can be postponed to the later period.
 - **Meeting Fodder crisis:** Every piece of land area is effectively utilized. Plantation of perennial legume fodder trees on field borders and also fixing the atmospheric nitrogen. These practices will greatly relieve the problem of non-availability of quality fodder to the animal component linked.

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- **Solving Fuel and Timber Crisis:** Linking agro-forestry appropriately the production level of fuel and industrial wood can be enhanced without determining effect on crop.
 - This will also greatly reduce deforestation, preserving our natural ecosystem.
 - **Employment Generation:** Combining crop with livestock enterprises would increase the labour requirement significantly and would help in reducing the problems of under employment to a great extent.
 - IFS provide enough scope to employ family labour round the year.

Farming System Concept

- ▶ A farm is a system in that it has **INPUTS, PROCESSES** and **OUTPUTS**.
- ▶ Depending on the type of farming e.g. arable/pastoral, commercial/subsistence, the type and amount of inputs, processes and outputs will vary.
- ▶ Income through arable farming alone is insufficient for bulk of the marginal farmers.
- ▶ The other activities such as dairying, poultry, sericulture, apiculture, fisheries etc. assume critical importance in supplementing their farm income.

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- **INPUTS** are the factors that a farm needs to work.
 - Inputs can be divided into two groups:
 - Physical inputs are naturally occurring things such as water, raw materials and the land.
 - Human or Cultural inputs are things like money, labour, and skills.
 - **PROCESSES** are the actions within the farm that allow the inputs to turn into outputs. Processes could include things such as milking, harvesting and spraying.
 - **OUTPUTS** can be negative or positive. Negative outputs include waste products and soil erosion.
 - The positive outputs are the finished products, such as wheat, seeds, meat, milk, and eggs, and the money gained from the sale of those products.

Time and space concept

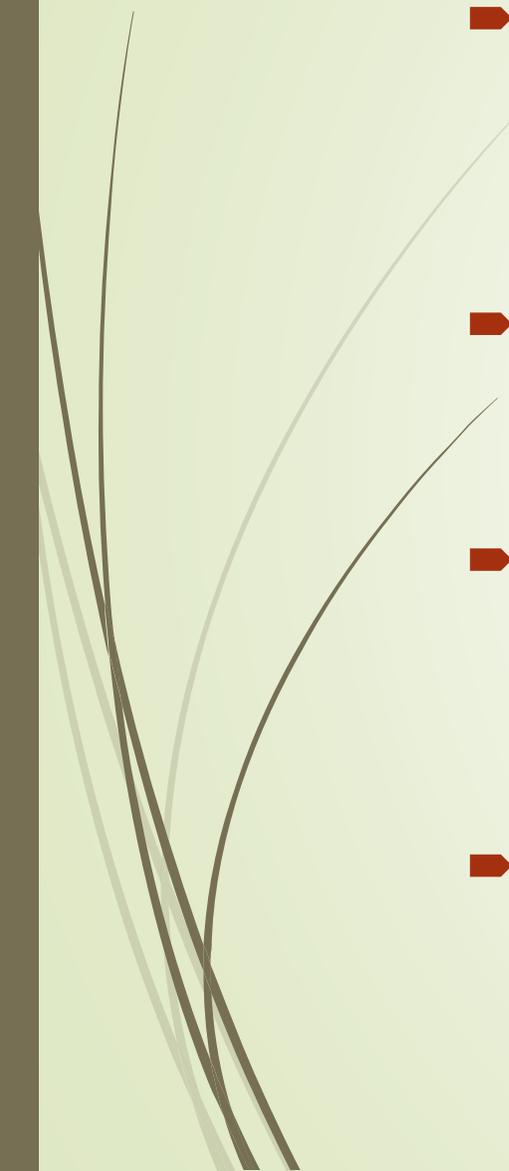
- ▶ Time concept relates to increasing crop intensification in situation where there is no constraint for inputs.
- ▶ In rain-fed areas, where there is no possibility of increasing the intensity of cropping, the other modern concept (space concept) can be applied.
- ▶ In space concept, crops are arranged in tier system combining two or more crops with varying field duration as intercrops by suitably modifying the planting method.

Goals of Integrated Farming System

- ▶ Provide a steady and stable income rejuvenation/amelioration of the system's productivity.
- ▶ Achieve agro-ecological equilibrium through the reduction in the build-up of pests and diseases, through natural cropping system management and the reduction in the use of chemicals (in-organic fertilizers and pesticides) to provide chemical free healthy produce and environment to the society.

Limitations of Integrated Farming System

- The need to provide for some measure of food security.
- The need to use the resources of soils, climate, etc. to provide employment and economic activity.
- The need to increase inland fish production, given the water resources available and static world fish output and that the rapidly developing sub-sectors of the economy (e.g. tourism) are not only fragile but can ultimately be self-destructive if not carefully handled and also dramatically increase food importation.
- With the new world trade situation of reduced farm and export subsidies, the cost of imported food (and feed) is rising.
- Developed, "modern" agriculture is not necessarily energy-efficient agriculture.

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- The lack of animal feed throughout the year and unavailability of labour in needy times are the major production constraints in IFS.
 - Resource-poor farmers are not able to invest more capital as initial investment as a constraint since there is need of immediate economic returns to meet their food requirements, schools, medical treatments and loan- repayment.
 - The high start-up costs may constrain farmers from switching to integrated farming and from exploiting the benefits of resource integration.
 - Procuring the improved breeds of livestock, timely availability of fish seed and feed, low cost energy efficient pumping machine, information on government schemes and credit support from financial institutions.
 - Lack of scientific knowledge on rearing of animals, unavailability of improved breeds in the local markets and lack of financial support respectively



THANKS

