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Cultivating Prosperity: The Strategic Synergy of Farming and Cropping Systems for Maximum Yield

Meghana[1]*. N., Y. N. Shivalingaiah[2], Shreya S Hanji[3] and Jagadish.H.M[4]

1Ph.D Scholar, Division of Agricultural Extension, Indian Agricultural Research Institute, New delhi

2 Professor and Head, Department of Agricultural Extension, College of Agriculture, UAS, GKVK, Bengaluru (Karnataka), India.

3 1Ph.D Scholar, Division of Agricultural Economics, Indian Agricultural Research Institute, New delhi

4 Ph.D Scholar, Department of Agricultural Extension, College of Agriculture, UAS, GKVK, Bengaluru (Karnataka), India

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Introduction:

India, with over 58% of its population relying on agriculture for livelihood, has witnessed increased agricultural productivity in recent decades. However, persistent yield gaps in many crops, coupled with factors like post-green revolution effects, soil degradation, climate change, nutrient imbalances, and decreasing land holdings, have led to volatile agricultural growth. The average land holding size has dwindled from 2.28 hectares in 1970-71 to 1.16 hectares in 2010-11, and if this trend continues, it may reach 0.32 hectares by 2030, posing a significant challenge to the sustainability and profitability of farming.

Addressing these challenges is crucial as India's food production needs substantial growth due to expected population growth. Achieving the required production levels with high productivity and sustainability is possible through holistic and integrative farming systems. These systems offer comprehensive solutions to enhance productivity, profitability, and long-term production sustainability, contributing to resolving fuel, feed, and energy crises, creating job opportunities, ensuring consistent income, and promoting agricultural-oriented industries.

Agricultural productivity is a critical factor in ensuring food security and supporting the livelihoods of millions of people worldwide. Farming systems and cropping systems are integral components of agricultural practices that determine how land is utilized, crops are cultivated, and resources are managed. These systems have evolved over time in response to technological advancements, environmental conditions, and societal needs. The way these

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systems are designed and implemented directly affects the productivity of agricultural activities.

What is farming system?

Farming system is a decision-making unit comprising the farm household, cropping and livestock system that transform land, capital and labour into useful products that can be consumed or sold. It represents an appropriate combination of farm enterprises (Agricultural crops, horticulture, livestock, fishery, forestry, poultry) and the means available to the farmer to raise them for profitability. It is a complex inter-related matrix of plant, soil, implements, power, capital, labour.

Types:

- **According to land labour and capital investment:** Extensive cultivation and Intensive cultivation.
- **According to value of product:** Specialized farming and Diversified farming.
- **Other types:** Shifting cultivation, Subsistence farming, Organic farming, terrace farming, vertical farming, precision farming, rainfed farming, dry land farming, irrigated farming.

One of the most effective and integrative approach of farming is integrated farming system. IFS is a agricultural system that integrate livestock and crop production which has revolutionized conventional farming of livestock, aquaculture, horticulture, agro-industry and allied activities.

Modern IFS model:

Agriculture + livestock, Agriculture + livestock + poultry, Agriculture + livestock + horticulture, Agriculture + horticulture + Sericulture, Agriculture + Silvipasture, Agriculture (rice) + fish culture + piggery, Agriculture (rice) + fish + mushroom cultivation.

Key Considerations in Crafting an Ideal Farming System

The selection of a farming system is influenced by a combination of factors that reflect the local context, resources, goals, and constraints faced by farmers. These factors vary from region to region and can significantly impact the success and sustainability of the chosen farming system. Some key factors influencing the selection of a farming system include temperature, precipitation, seasonality

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Soil fertility, texture, drainage topography, land availability, water resources, labor availability and market opportunities.

Cropping system:

Cropping systems are important component of a farming system, that represents a cropping pattern. It refers to the crops and crop sequences and the management techniques used on a particular field over a period of years. Cropping systems based on climate soil and water availability have to be evolved for realizing the potential production levels through efficient use of available resources. Alteration in crop geometry may help to accommodate intercrops without losing the base crop production.

Selection of farming system and it's components is equally important as technology in order to achieve productive and sustainable agriculture. With this concern, even government is promoting integrated farming systems in doubling the farmers income. As Indian agro-climatic situations are heterogeneous and different zones need different farming system approaches based on the resource availability, climate, soil type and fertility. The role of extension agent is crucial in developing most appropriate farming system approach to achieve the all-round development among farming community.

Classifications of cropping systems:

Mono-cropping or Single Cropping (Groundnut or cotton or sorghum), Multiple Cropping (Rice+potato+green gram), inter-cropping (Groundnut+Redgram), mixed cropping and sequence cropping (Rice+potato+groundnut), Multistoried Cropping (Sugarcane + Mustard + Potato), Rice based cropping system, Sorghum based cropping system, Pearl millet-based cropping system and Wheat and gram-based cropping system.

Farming system approach:

FSA approach evolved to understand the problems of farmers from the perspectives of farmers and finding solutions based on a proper understanding of their objectives and their environments. Here farm is viewed in a holistic manner. In India FSR was first commenced by TNAU in 1976 in Paiyur and Yercaud.

Conclusion:

Due to ever increasing population and decreasing in per capita availability of land in India, there is little scope for horizontal expansion of land for food, feed, fuel and fibre production. Only vertical expansion is possible by integrating various farm enterprises

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requiring less space and time and ensuring periodic income to the farmer. The farming system approach, therefore, assumes great importance for sound management of farm resources to enhance farm productivity, reduce the degradation of environmental quality and improve the quality of life of farmers and above all to maintain sustainability in farm production and productivity. Farming systems and cropping systems play a pivotal role in shaping agricultural productivity. By adopting diverse, sustainable, and technologically advanced approaches, farmers can optimize resource utilization, minimize risks, and contribute to global food security. As the world faces increasing challenges, the role of these systems in ensuring a productive and sustainable agricultural sector becomes even more crucial.

Reference:

Aiswarya, Padma, S. And Vidhyavathi, A.,2020, Economic analysis of integrated farming systems in the Kuttanad region of Kerala state, India: A case study, *J. Appl. & Nat. Sci.*, 12(**2**): 270 – 276.

Anderson, J.R., 1994, Agricultural technology: policy issues for the international community.

Murugan, G. And Kathiresan, R.M., 2005, Integrated rice farming system. *Indian Farming*, 55 (5): 4-6.

Shwetha, N. V.,2016, Performance and perception about different farming systems adopted by farmers of Chikkaballapura district of Karnataka. *M.Sc. (Agri.), Thesis (Unpub.)*, Univ. Agri. Sci., Bangalore.