

Integrated Livestock Farming: A Holistic Management Approach

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Abstract

Small and marginal farmers can increase their economic yield per unit area per unit time by using a livestock-based integrated farming system. Waste materials are effectively recycled in this device by connecting suitable components. As a consequence, pollution in the air is minimized. The factors responsible for the farming system's sustainability are recycling of materials, byproducts, and waste material in an integrated farming system. The processing of eggs, meat, and milk provides nutritional protection and income to farmers throughout the year, thanks to the integration of various livestock components with crops. Combining crop and livestock enterprises will dramatically increase labor demand and, as a result, help to significantly reduce unemployment issues. ILFS offers enough resources for family labor during the year. The main issues for sustainable agriculture are food stability, natural resource conservation, and environmental protection. Integrating livestock is the way to go if you want to optimize the use of available resources while still protecting the ecosystem for economic development. Diversifying farm production, growing profits, enhancing nutritional security, and promoting nutraceuticals are all benefits of an integrated farming system.

Keywords: Integrated Livestock Farming; Nutritional Security; Farming Systems

Introduction

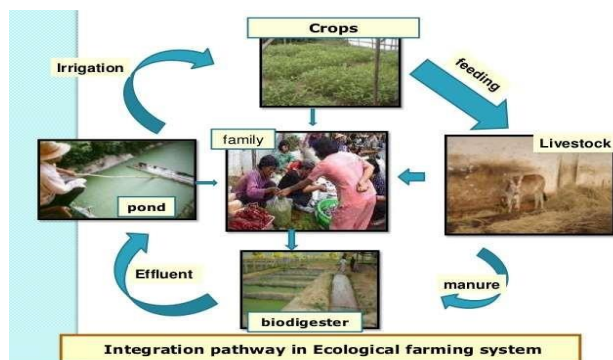
Integrated farming is a whole farm management system which emphasizes on a holistic management approach looking at the whole farm as cross linked unit, on the fundamental role of function of agro-ecosystems, on nutrient cycles which are balanced and adopted to the demand of the crops and on health and welfare of the livestock of the farm (Kochewad *et al.*, 2017). Integrated farming system, which is a synonym to family farming, provides an

opportunity to profitably engage the available man power in the farm family to the fullest extent throughout the year leading to higher income and family satisfaction. A good ILFS aims at least dependence on outside resources and efficient recycling of available farm resources.

Livelihood and nutrition is one of the most important emerging sectors that can provide assured source of income to

poor tribal farmers for sustaining livelihood. Integrated farming system approach is a multi-disciplinary holistic approach to solve these problems of small and marginal tribal farmers. The declining trend of per capita land availability poses a serious challenge to the sustainability and profitability of tribal farmers. Under such conditions it is appropriate to integrate land based enterprises viz., crop production, dairy, horticultural crops, poultry and fisheries within the farm with the objective of generating adequate income and employment for tribal farmers and thereby improving livelihood and nutritional security. The traditional monoculture production system adopted by these tribal farmers has been explorative and the natural resources like soil and water were subjected to immense pressure beyond carrying capacity. As a result sustainability of agriculture production system and the farming system is in crisis. This suggest an urgent need of integrated livestock farming system development where the various components of the farming system may be integrated to improve productivity and profitability as well as resource conservation along with maintenance of the environment.

Cropping income for the average farmer is inadequate to support his family. As a result, the farmer must be confident of a daily financial benefit in order to sustain a fair standard of living, as well as alternative enterprises such as a mixture of farming systems, such as fish and duck farming, cattle and paddy farming, and so on. Based on the evidence mentioned above, there is a crucial need for the implementation of integrated systems.



Advantages of Integrated Livestock Farming System

- ✓ Productivity benefits from increased economic yield per unit area per time.
- ✓ Improved profitability due to the recycling of enterprise waste as energy sources for other processes.
- ✓ A higher degree of production sustainability.
- ✓ Implementation of multiple manufacturing processes (get rid of malnutrition).
- ✓ To prevent waste from piling up.
- ✓ To ensure cash availability and money flow throughout the year.
- ✓ Resolving energy shortages.
- ✓ The Silvi pasture system reduces forest pressure.
- ✓ To improve literacy rates, the system forces entrepreneurs to learn more.
- ✓ Allow for the expansion of agriculture-related industries.
- ✓ Rural women's participation in production

Different Integrated Farming System is

- Integrated fish-livestock farming system
- Integrated crop-livestock farming system Following enterprises could be combined
- Agricultural + livestock
- Agricultural + livestock + poultry
- Agricultural + horticulture + sericulture
- Agricultural + silvi-pasture
- Agricultural (rice) + fish culture
- Agricultural(rice) + fish+ mushroom cultivation
- Agricultural + apiary
- Agricultural + duckery + poultry

Among Them Commonly Used and Popular Integrated Farming Systems are

1. Duck cum fish farming.
2. Cattle cum fish farming.
3. Poultry fish farming.

1. Duck Cum Fish Farming

Duck cum fish farming is one of the first things that come to mind. Duck production and fish farming are combined in this system. A fish pond, which is a semi-closed biological system containing a variety of aquatic animals and plants, provides a disease-free environment for ducks. Ducks, in turn, eat tadpoles, juvenile frogs, mosquitoes, and dragon flies larvae that aren't eaten by fish. The duck droppings contain 25% organic and 20% inorganic substances, including carbon, phosphorus, potassium, nitrogen, calcium, and other elements. As a result, it is an excellent source of fertilizer in fish ponds for the growth of fish food organisms. Another benefit is that it feeds on snails, which are vectors for fish parasites and fertilize ponds while also releasing nutrients. Duck dropping goes directly in pond, which in turn provides essential nutrients to stimulate growth of natural food. This type of integration farming system is widely followed in most parts of India like West Bengal, Assam, Kerala, Tamil Nadu, Andhra Pradesh, Bihar, Orissa, Tripura and Karnataka. Most commonly breed used in Indian is **Indian Runner** under this farming system. It is highly profitable because it significantly increases animal protein production per unit area in terms of fish and duck. Although conventional fish ponds produce about 4 tonnes of fish per hectare, the integration method will produce more than 10 tonnes per hectare (12.2-19.5 tonnes), which is a 2 to 3.9fold increase.

It is recommended that fish fingerlings larger than 10 cm be discharged when culturing fish with ducks; otherwise, the ducks can eat the fingerlings. The size of the pond and the number of ducks released in it both affect fingerling stocking density. Phytoplankton-feeding silver carp and zooplankton-feeding catla and common carp are suitable for duck-fish culture because nitrogen-rich duck manure boosts both phyto and zooplankton production. In duck-fish culture, a fish yield of 3,000-4,000 kg/ha/year has been achieved using a one-year fish rearing cycle and a stocking density of 20,000/ha. In addition, eggs and

duck meat are obtained in significant amounts on a yearly basis.

2. Cattle Cum Fish Farming.

Cattle ruminants Fish farming is thought to be a perfect way to recycle organic waste. Fish farming with cow manure is a popular practice all over the world, but Hong Kong, Taiwan, and the Philippines have successfully commercialized cattle fish integration farming and obtained substantial fish yields. A cow or buffalo excretes 12000kg of dung and 8000 litres of urine per year on average. Filter-feeding and omnivorous fishes both benefit from cattle faeces and urine. Cow manure particles sink at a slower rate than any other livestock (6cm/min). This gives the fish enough time to eat the edible pieces of the dung. A herd of three to four cows will provide enough manure to fertilise one hectare of pond. To make cow manure handling simpler, the cow shed should be constructed near to the fish pond. Farmers also earn milk, fish, and calves, which raises revenue while lowering input costs

3. Poultry fish farming.

Poultry development for meat (broilers) or eggs (layers) can be combined with fish farming to save money on fertilizers and feeds while optimizing benefits. It is also a popular method that is used in a limited number of situations, and economic research has shown that it is both economically and technically viable. Birds were kept on the floor above the pond, and their droppings dropped straight into the pond. In poultry fish farming, 500 birds are sufficient to fertilize a pond area of one hectare. In a composite culture system stocked at 8000 fish per ha; a yield of about 3.9t/ha/year was achieved (Kalita et al.2016). When a combination of cow dung and poultry droppings was used, it resulted in a faster growth rate and a higher survival rate. Poultry-fish incorporation also maximizes space usage, decreases labor costs associated with transporting manure to ponds, makes the poultry house more sanitary, and provides water for poultry

husbandry practices from the fish pond. The integration of fish with livestock should be taken seriously because it has the potential to greatly enhance rural life by growing return on investment. While there is no information on production details, it can be found with proper management and technical skills.

Conclusion

Small and marginal farmers can increase their economic yield per unit area per unit time by using a livestock-based integrated farming system. Waste materials are effectively recycled in this device by connecting suitable components. As a consequence, pollution in the air is minimized. The factors responsible for the farming system's sustainability are recycling of materials, byproducts, and waste material in an integrated farming system. The processing of eggs, meat, and milk provides nutritional protection and income to farmers throughout the year, thanks to the integration of various livestock components with crops. Combining crop and livestock enterprises would dramatically increase labor demand and, as a result, substantially reduce the issue of underemployment. ILFS gives you enough versatility to recruit family labor all year. The main issues for sustainable agriculture are food stability, natural

resource conservation, and environmental protection. Integrating livestock is the way to go if you want to optimize the use of available resources while still protecting the ecosystem for economic development. Diversifying farm production, growing profits, enhancing nutritional stability, and encouraging nutrient recycling are all benefits of an integrated farming system.

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