

Integrated Farming System and Sustainable Agriculture in India

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Integrated Farming (IF) is a whole farm management system which aims to deliver more sustainable agriculture. Farming is process of harnessing solar energy in the form of economic plant and animal products. System implies a set of practices and processes organized into functional entity. It is based on concept that 'there is no waste' and 'waste is only a misplaced resource.' which become valuable material for another product. The IFS is defined as the biologically integrated farming system which integrate natural resources regulation mechanisms into farming activities to achieve: maximum replacement of off farm inputs, secure sustainable production of high-quality food and other products through ecologically proffered technologies, sustain farm income, reduce sources of present environment pollutions generated by agriculture and sustains the multiple function of agriculture.

Problems of present-day agriculture

Decline in factor productivity, Static or decline in food production, increasing malnutrition, Shrinkage in net cultivable area, increasing environmental pollution, Depleting ground water table, increasing cost of production, Low farm income, increasing unemployment, decline in agriculture growth rate.

Primary goals of IFS

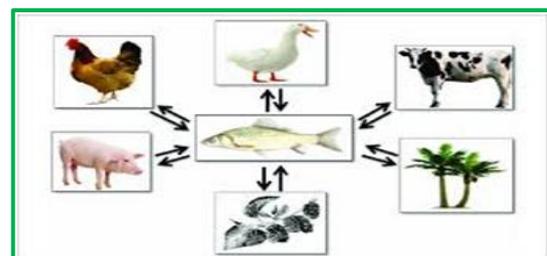
Maximization of yield of all component enterprises to provide steady and stable income. Rejuvenation of systems productivity and achieve agro-ecological equilibrium, avoid buildup of insect pests, diseases and weed population through natural cropping system and keep them at low level of intensity, Reducing use of chemicals.

Objectives of integrated forming

Should be area specific, formulate models involving main and allied enterprises for different farming situations, it should ensure optimal utilization and conservation of available resources with efficient recycling within each system included, It should raise the net return of the farm household by complementing main activity with allied enterprises, it should address the nutritional insecurity of resource poor farmers vulnerability and poverty of landless laborers.

Different component of Integrated Farming System

Field crops, Crop production, Vegetables, Fruit cultivation, Poultry farming, Livestock integration, Duckery, Aquaculture, Agroforestry, Bee- keeping, Mushroom cultivation, Bio-gas plant.



Elements of integrated farming system

Watershed, Farm ponds, Bio-pesticides, Bio-fertilizers, Plant products as pesticides, Bio-gas, Solar energy, Compost making, green manuring, Rain water harvesting

Integrated farming system models

Agricultural + livestock
 Agricultural + livestock + poultry
 Horticulture + fish culture + poultry
 Pig cum fish culture
 Agricultural + silvipasture
 Sericulture + fish culture
 Fish culture + sericulture
 Agricultural (rice) + fish+ mushroom cultivation
 Agricultural + duckery + poultry
 Poultry + fish culture

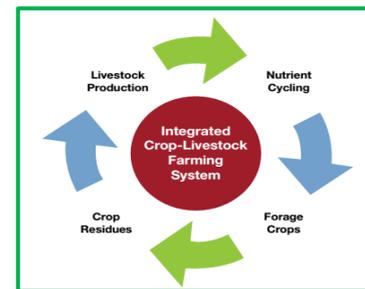


Table 1: Productivity and Economic Analysis (Coimbatore, Tamil Nadu)

This table compares “Cropping alone” with integrated systems involving fish, poultry, pigeons, and goats.

Farming systems	Production cost(Rs/ha)	Gross return(Rs/ha)	Net return(Rs/ha)	Per day return(Rs/ha)
Cropping alone	24,922	61,112	36,190	167
Crop+fish+poultry	44,627	1,59,292	1,14,665	436
Crop+fish+pigeon	43,310	1,61,772	1,18,462	443
Crop+fish+goat	51,483	1,78,047	1,26,564	493

(Jayanthilal *et al.*,2002)

Table 2: Economic Analysis of 2-Acre IFS Module (Bihar)

This table breaks down the income contribution of specific components like Rice-Wheat, Vegetables, Fishery, Duckery, and Cattle.

Farming System	Rice-Wheat	Vegetable	Fishery	Duckery	Cattle	Net Income (₹)
Rice-Wheat system	46,122	-	-	-	42,290	46,122
Rice-Wheat + Dairy	43,815	-	-	-	42,290	86,105
Rice-Wheat + Dairy + Fish	38,050	-	22,500	-	42,290	102,840
Rice-Wheat + Dairy + Fish + Duckery	38,050	-	22,500	18,000	-	144,165
Rice-Wheat + Dairy + Fishery + Duckery	38,050	-	22,500	18,000	42,290	134,130
Rice-Wheat + Vegetable + Dairy	32,285	53,790	-	-	42,290	128,365
Rice-Wheat + Vegetable + Dairy + Fish	32,285	53,790	22,500	-	42,290	150,865

(Sanjeev kumar *et al.*, 2012)

Table 3: The table measures Component productivity (in kg) and System productivity (in kg/ha) for four different farming systems:

Farming System	Crop (kg)	Poultry (kg)	Pigeon (kg)	Fish (kg)	Goat (kg)	System Productivity (kg/ha)
Cropping alone	12,995	-	-	-	-	12,995

Crop + fish + poultry	26,352	1,205	-	2,052	-	29,609
Crop + fish + pigeon	24,854	-	2,545	1,774	-	29,173
Crop + fish + goat	25,725	-	-	1,975	9,979	37,679

(Rana S S, 2015)

Table 4. Economics of integrated farming system

Farming system	Production cost (Rs/ha)	Gross return(Rs/ha)	Net return (Rs/ha)
Cropping alone	27822	64975	37153
Crop + fish + poultry	48303	146035	97731
Crop + fish + pigeon	47090	145868	98778
Crop + fish +goat	55549	186667	131118

(Rana S S, 2015)

Table 5. Employment generation under one acre IFS module

Farming system	Cereals only	vegetable	poultry	fishery	Goatry	Dairy	Total man days
Cereals only	416	-	-	-	-	-	416
Crop +vegetable	220	310	-	-	-	-	530
Crop +fish +poultry	376	94	60	40	-	-	570
Crop +fish +duck	376	94	-	40	-	-	560
Crop +fish +goat	376	94	-	40	110	-	620
Crop +fish +cattle	376	94	-	40	-	170	680
Crop+ mushroom+ goat	376	94	-	40	110	170	650

(Jayanthilal *et al.*,2002)

Advantages of IFS

Increased productivity through increased economic yield per unit area per time. Improved profitability achieved due to recycling of waste of enterprise as energy inputs for other system. Greater sustainability in production. Integration of different production systems. (solve malnutrition)

Constraints

Nutritional values of crop residues are generally low in digestibility and protein content. Physical and chemical treatment of these residues is technically possible. Expensive to poor farmers, Crop residues are primarily soil regenerators, Intensive recycling can cause nutrient losses, Farmers prefer use of chemical fertilizer instead of manure because it acts faster and easy to apply, Resource investments are required to improve intake and digestibility of crop residues.

Conclusion

The integration of fish with livestock and agriculture needs to be viewed because this activity can go long way in the uplift of rural life through manifold increase in return on investment. Integrated farming system seems to be the answer to the problems of increasing food production, for increasing income and for improving nutrition of the small scale farmers with limited resources without any adverse effect on environment and agro- eco-system.

References

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