

CATTLE BASED INTEGRATED FARMING SYSTEM AND IMPROVING INCOME THROUGH IT

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Integration is a *Latin* term meaning ‘*whole*’ (entire part). Naturally, farmers rear all types of livestock and poultry in smallholdings with agricultural components of horticulture (vegetables and fruits), plantation, agroforestry (trees), sericulture (silk) either alone or in combination depending upon the landholding capacity of the farmers and other available resources. Integration is the concept where animals are reared on agricultural waste. Animals are used for ploughing and their dung is used as fertilizers/fuel i.e., the output of one unit is used as input of another unit. In the view of problems of insufficient monsoon rains, labour problem and insufficient price for the produced commodities, the concept of the Integrated Farming System (IFS) is gaining interest in the farmer’s field level.

Advantages of Integrated Farming System

1. Yield and income per unit area per unit time will become improved.
2. Recycling of waste products can be done with full efficiency.
3. The production level of milk, egg, meat, grains and crops will be increased.
4. Labour and land area can be efficiently utilized

5. Nutrient recycling can be done
6. Nutritional security to all the components of IFS can be achieved
7. Biogas and agro forestry enterprise inclusion in IFS can resolve the problem of the energy crisis
8. Soil erosion can be prevented
9. Regular employment generation and regular income to the farmers is possible
10. Regular and sufficient flow of input and output of one unit to another unit.

Components of IFS

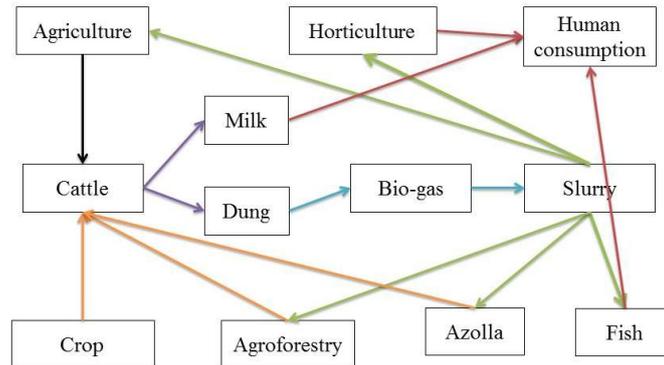
- Agriculture: Rice, Wheat, Maize, Sorghum, Millets
- Horticulture:
 - *Fruit crops*: Banana, Mango, Guava, Papaya, Apple
 - *Floriculture*: Flowers
- Fish: Marine water
- Animal Husbandry: All domestic animals (milk, meat, both)
- Agroforestry: Trees- timber

Sub-components

- Mushroom
- Beekeeping
- Azolla
- Berseem
- Sericulture
- Vermicompost

Types of livestock-based farming system

1. Cattle + Crop + Backyard Poultry
2. Agriculture + Cattle + Fish + Biogas
3. Agriculture + Cattle + Horticulture + Fish + Biogas
4. Agriculture + Cattle + Agroforestry + Fish + Biogas
5. Agriculture + cattle + Fish + Duck (living scavengers) + Biogas.

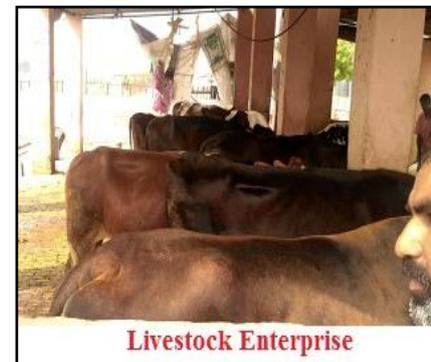


Agriculture

It includes fodder and crop by-products (after harvesting rice, wheat, maize, sorghum, Bajra). The fodder crop cultivated for cattle includes fodder maize, Napier grass. Minimum of two crops can be planted per year that includes Kharif crop (rice) and Rabi crop (wheat) and in between two crops, one additional crop *summer moong* can be cultivated that will increase the soil fertility. Farmyard manure/slurry (biogas by-product) can be used as a natural fertilizer to improve soil fertility and increase production per unit area.

Cattle

Indigenous or crossbred animals can be used and the number of an animal depends on land availability for the cultivation of fodder, by keeping in mind that one adult cattle consume 30-35 kg green fodder and about 4 kg busa per day. Minimum of 2 animals can be kept for the betterment and in one acre of land 2-3 animals be reared. Milk produced is sold to retailers/consumers directly or to the cooperatives. Dung, left over feed, urine is recycled and can be used efficiently.



Horticulture

Horticulture includes *fruit crops* like mango, guava, banana, papaya and *vegetables* like brinjal, tomato, green chili, ladyfinger. The slurry or FYM from the biogas can be used as fertilizer for those plants. The harvested vegetables and fruits from the plants may be consumed by the farmers as organic or can be sold out to consumers.

Fish

Slurry by-products and droppings of poultry can be used as feed for fish. Major Six varieties of fish are being reared under Indian conditions which include Catla, Rohu, Mrigal, Common carp, Indian carp and Silver carp. For site selection of pond construction, water retention capacity of soil and soil fertility should be more. Ensure that water is available throughout the year. The minimum depth of the pond should be 3.8m and water should be upto 3m.

Types of fish	Percentage inclusion in the pond	
	Catla	40
Rohu	30	10
Mrigal	30	10
Common carp		25
Grass carp		20
Silver carp		25



Biogas

A biogas plant is based on a number of animals. For 2-3 animals in a farm, 2m³ size of a biogas plant to be considered. Dung will be used for biogas production and the remaining slurry will be used as farmyard manure for fish cultivation, agriculture and horticulture. Biogas plant to be maintained under anaerobic condition.



Bio-Gas plant

Plant size (m ³)	Minimum no. of animal
2	3
3	4
4	6
6	10

Azolla

It can be used as an alternative to green fodder and concentrate with reducing the feed inclusion cost. There are 6 varieties of Azolla out of which Microfilaria, Finnata is suitable for livestock. 2 kg Azolla per day can be incorporated in the feed of cattle with a reduction in 1kg concentrate per day i.e., about 35%. Azolla can be fed for fish, cattle, buffalo, pig and poultry. Azolla feeding can increase milk yield by 15-20 %

Kitchen garden

Little space is enough for a kitchen garden and can be used for growing seasonal vegetables like green chili, tomato, lady's finger, brinjal.

Mushroom

In India button mushroom grown seasonally in environmentally controlled cropping house with proper temperature, relative humidity (80-90%) and ventilation. The leftover straw is used for mushroom production after autoclaving and after mushroom cultivation, the spent straw is used as fertilizer for fields. 10-14 kg mushroom cultivation done in 100 kg compost.



Mushroom Cultivation

Conclusion

With the efficient use of all major and minor components of agriculture with its allied activities, the production per unit area can be increased with increasing the economic status of the farmer with minimal investment per unit area in comparison to the individual farming.

References

Gill, M. S., Singh, J. P., &Gangwar, K. S. (2009). Integrated farming system and agriculture sustainability. *Indian Journal of Agronomy*, 54(2), 128-139.

http://agritech.tnau.ac.in/agriculture/agri_majorareas_ifs.html

Kochewad, Sanjivkumar. (2017). Livestock based integrated farming systems for livelihood improvement of small and marginal farmers. *South Asian Journal of food technology and Environment*. 3. 526-532.

Pillai, P. K., Premalatha, S., &Rajamony, S. (2002). Azolla-A sustainable feed substitute for livestock. *Leisa India*, 4(1), 15-17.

Sharma, V. P., Annepu, S. K., Gautam, Y., Singh, M., & Kamal, S. (2017). Status of mushroom production in India. *Mushroom Research*, 26(2), 111-120.