



# Review on Integrated Duck cum Fish Farming: A Feathery Solution for Sustainable Food and Income

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## Abstract

Combining duck rearing with fish farming emerges as a viable initiative for the agricultural community to secure a sustainable source of income. The practice of raising domestic ducks alongside fish cultivation is gaining popularity among farmers engaged in agricultural pursuits. Ducks play a crucial role in this system by controlling pests and enriching the environment with nutrient-packed droppings, fostering the growth of natural fish food. Essential components for establishing this integrated farming approach include setting up a duck shed, determining stocking rates for fish and ducks per hectare, and implementing proper health care management. The integrated system yields significant outcomes, encompassing the production of eggs, duck meat, and fish, thereby contributing to both food and income for farmers. This strategy, centred on resource efficiency and income generation, holds great potential for economically disadvantaged rural families, addressing critical challenges and aligning with broader agricultural objectives.

**Keywords:** Duck; Integrated; Profitable; Stocking; Sustainable

## Introduction

Duck rearing has become a profitable livestock industry globally, driven by the demand for its eggs, meat, and feathers. Duck-cum-fish integrated farming, a widely adopted practice, brings together fish culture and duck farming. The common need for water by both fish and ducks, along with various other considerations and benefits, forms the foundation for this integrated approach. In this combined system, the waste generated from the duck shed can be recycled and utilized for fish culture, showcasing the sustainable synergy of the two farming components. Livestock census data from 2019 indicates that India's duck population stands at 33.51 million, constituting 4.0% of the total poultry population, with a significant presence in Eastern (64.5%), North Eastern

(16.02%), and Southern (12.60%) states [1]. This integrated fish farming system produces high yields with low input, with the fish receiving limited, if any, supplementary feed.

## Duck cum Fish Farming

Integrated fish farming, which combines duck and fish production, involves using duck manure as fertilizer directly in fish ponds. Ducks play a vital role in this integrated system by consuming juvenile frogs, tadpoles, and insects, creating a safer environment for fish. Additionally, ducks get 50-75% of their total feed requirement from the pond. It also keeps the water clean, which aids in elevating the dissolved oxygen (DO) levels in pond water. Duck droppings contribute essential nutrients like carbon, nitrogen, and phosphorus,

stimulating the growth of natural food organisms in the pond [2]. This integrated system yields meat, eggs, and fish, providing additional food and income for farmers. The recycling of duck waste in the pond enhances production and income while minimizing environmental impact. [3]. The use of livestock waste in integrated fish farming reduces operational costs, making it economically viable, especially for low-income fish farmers.

### Preparation of Duck Shed

The duck house should be spacious, well-ventilated, and designed to facilitate waste disposal into the pond. Proper disinfection procedures are essential before shifting ducks. The duck house should be roomy and well ventilated. The floor is perforated (4-6 cm<sup>2</sup> mesh). About 0.3 -0.5m<sup>2</sup> floor space is required for each bird. The floor should be raised at 1.2m above the highest water level. Two bridges, one connecting the house and the pond embankment and the other from pond embankment to the water should be provided for movement of ducks. A duck proof fencing is erected around the pond to confine the duck in the pond area. [4].

### Stocking Rates of Ducks and Fingerlings

To effectively fertilize a one-hectare fish pond, maintaining 250 to 300 ducks is recommended, with fish stocking rates varying depending on the species. Farmers commonly use local indigenous duck varieties for integration, such as F1 hybrids of Khaki Campbell and local Pati ducks, Kamrupa, and Chara Chameli. Proper management of stocking rates and ratios is crucial to prevent pond overcrowding [4].

### Feeding of Ducks

Ducks are given a free range in the pond where they may find their natural food such as tadpoles, insects larvae, mollusks and aquatic weeds. In addition, the ducks are fed with standard ration at the rate of 100g bird-1day-1. Alternatively, the ducks may be fed with a mixture of standard poultry feed (layers mesh) and rice bran at 1:2 ratio. Feed should be supplied only in the duck pen twice a day. Water should be provided in flat water. Proper feeding practices contribute to the overall health and productivity of the ducks [4].

### Health Care

Ducks should be vaccinated against Duck cholera and Duck plague to ensure their health and prevent the spread of diseases. Strict hygiene practices must be maintained.

### Production details from one hectare

Ducks start laying eggs at the age of 7-8 months, and regular egg collection is essential. Ducks are typically reared up

to 12-18 months before disposal. The integrated system yields significant production, with statistics indicating egg production at 19,000-22,000 per 250 ducks per year, duck meat at 240-260 kg per 250 ducks (average of three years) and fish production at 4,000 kg per hectare per year [4].

Integrated duck cum fish farming presents a promising opportunity for resource-poor families in rural areas, offering a sustainable and profitable farming system. This approach contributes to livelihood generation, nutritional security, and poverty alleviation at the grassroots level. By focusing on resource efficiency, productivity, and income generation, this integrated system addresses key challenges faced by rural communities and aligns with the broader goals of agricultural and allied activities.

### Conclusion

The integration of duck rearing with fish farming stands as a promising prospect for resource-poor families residing in rural areas, presenting a sustainable and lucrative agricultural system. This innovative approach not only holds the potential for economic success but also plays a vital role in addressing fundamental issues at the grassroots level, including livelihood generation, nutritional security, and poverty alleviation. At its core, the integrated duck-cum-fish farming system emphasizes resource efficiency, productivity, and income generation. By doing so, it directly tackles the pressing challenges faced by rural communities, offering them a holistic solution that aligns seamlessly with the broader objectives of agricultural and allied activities.

The benefits of this integrated approach extend beyond mere economic considerations. It contributes significantly to the livelihoods of rural families by creating diverse income streams through the production of duck eggs, meat, and fish. The nutritional security of these communities is also enhanced, as they gain access to a variety of protein-rich food sources. Moreover, the sustainable nature of this farming system helps mitigate environmental concerns by promoting efficient use of resources and reducing waste. The integrated approach harnesses synergies between duck and fish farming, creating a harmonious ecosystem where the by-products of one component become valuable inputs for the other. This closed-loop system minimizes environmental impact and maximizes resource utilization. In essence, integrated duck-cum-fish farming emerges as a multifaceted solution, addressing economic, nutritional, and environmental challenges faced by resource-poor rural families. By fostering sustainability, productivity, and income generation, this approach not only transforms local agriculture but also contributes to the broader goals of fostering resilient and thriving rural communities.

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