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## **Innovative Technologies and Best Practices for Sustainable Aquaculture in Haryana: A Comprehensive Study**

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### **Abstract:**

This research paper explores the aquaculture landscape in Haryana, India, with a focused lens on technological innovations and best practices that drive sustainable development within the sector. As aquaculture emerges as a vital contributor to food security, economic growth, and environmental resilience, the study highlights key advancements in breeding techniques, modern pond management, enhanced feed formulations, digital monitoring systems, and precision-based management tools. It assesses how these innovations improve production efficiency, promote fish health, and reduce ecological impact. The paper also addresses the challenges faced in adopting these practices, particularly among small-scale fish farmers, and underscores the need for broader dissemination and capacity-building initiatives. By presenting a comprehensive analysis of technological interventions, the study provides valuable insights to support sustainable aquaculture practices and strengthen the industry's growth in Haryana. The findings aim to inform policymakers, stakeholders, and the aquaculture community in fostering long-term viability and socio-economic progress across the region.

**Keywords:** Technical, Financial, Fish, Farms.

### **Introduction:**

Haryana is an agrarian state and ever since its creation in 1966, agriculture and allied activities have been the mainstay of the economy of the state. Even though, fish farming was introduced later than other farming activities, it became popular and that as a result, Haryana became one of the most important players in inland fisheries in India. According to government reports in 2012, the beginning also yielded low volume of fish production with only 58 hectares of village land dedicated to the fish culture which gave a low fame of 600 tonnes of fish. Nevertheless, this industry has grown exponentially to 23,220 hectares by the year 1990 and produced 33,040 tonnes in 2002 and finally, expanded to 3.3 million tonnes in the year 2018. Haryana has been recording higher fish yield than national average giving it an S ranking with production of 5600 kilograms per hectare. In spite of the fact that state only accounts 2.1 percent of the total fish production in India, the rich level of productivity in the state has been doing very well compared to national standards in the last twenty years.

Haryana has witnessed a fast growth of its fish farming business in the last few years. Almost 3/4th of the ponds and lakes in the state have been involved in fish farming; the lakes and ponds bring around R 125 crores per year in place of leasing money to the Village Panchayats. Besides that, more than 2, 500 autonomous pond units have been built by individual fish farmers on



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their territories. The overall fish production of Haryana has dramatically increased to 7,000 kilograms per hectare that is way above the national average of 2,900 kilograms. The industry is however still struggling with lack of well developed local fish marketing infrastructure. Farmers have to incur extra expenses of packaging and transporting their products to destinations in Delhi and other adjoining states. The government has also embarked on post-harvest infrastructure development where four special fish markets are developed in Faridabad, Panipat, Yamuna Nagar and Bahadurgarh to reduce this. Haryana State Agriculture Marketing Board manages these markets that also provide subsidized transport to markets through farm ponds.

Additional schemes launched by the government and favored by the Indian Council of Agricultural Research (ICAR) have gone up to the extent of providing more subsidy under the Central Sector Scheme on the Blue Revolution. Such subsidies cater to such fields like excavation of ponds, rehabilitation, input financing, and development of the waterlogged as well as saline fields. It is marked with the fact that Haryana is the first landlocked state in India which use inland subsurface salty water to rear white shrimp (*Litopenaeus vannamei*). The state will also set up advanced Ornamental Fish Hatcheries and Recirculatory Aquaculture System (RAS) in order to enhance the aquaculture even more. These are interventions geared towards increasing farmers income by three times, increase efficiency in production and add production. Moreover, there are 400 hectares of salty lands which are being converted to shrimp farms and subsidies are even given up to half of the entire cost to shrimp growers. New agricultural related activities in terms of waterlogged areas developed under districts such as Jhajjar and Charkhi Dadri is also going to provide better livelihood opportunities to the farmers affected by land degradation due to improper irrigation methods in the past.

Infrastructure is one of the major problems of fish farming industry in Haryana. Access to facilities like electricity, transport and markets is also very limited by many fish farmers in the state. This infrastructural lapse is an obstacle to effective transportation of fish to markets, which is made less profitable. Further, the industry also faces a number of challenges which comprises of high prices of inputs such as feeds and fertilizers, low productivity levels in the farms and limited accessibility to institutional credit. The sector is also susceptible to disease strikes and pests that might push farmers into huge losses.

The state government has also proposed the setting up of higher Ornamental Fish Hatcheries and Recirculatory Aquaculture System (RAS) units so as to further develop the aquaculture sector in Haryana fully. Such efforts are included as a part of a strategy that aims, not only at tripling income of fish farmers, but also making the production more efficient and increasing its volume in general. With the understanding of the huge potentials of underutilized lands, the state is changing more than 400 hectares of saline-affected lands into productive shrimp farms, and introducing financial assistance of up to 50 percent subsidies to promote take-up. Furthermore, there is an attempt to grow water logging blocks in localities like Jhajjar and



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Charkhi Dadri where water logging due to uncontrolled usage of water has resulted in land degradation in past. These will provide an opportunity to open up opportunities of environmental-adaptable types of aquaculture which will lead to opening of sustainable livelihood opportunities among the local farmers.

Nevertheless, the positive efforts exerted by the governmental bodies including the Indian Council of Agricultural Research (ICAR) and the Haryana State Agriculture Marketing Board are remarkable. Such initiatives have been in the form of increasing of the subsidy programmes, setting up special fish markets and encouraging the use of new state-of-art technologies to elevate the industry. The strategic measures like use of subsurface inland salty water in aquaculture, area conversion techniques like salty land to shrimp farm and establishment of Ornamental Fish Hatcheries and Recirculatory Aquaculture System (RAS) in the state show great intentions of the state of Haryana in terms of sustainable development of aquaculture.

The in-depth analysis provides valuable information on the future of the sector that will allow policymakers, stakeholders in the industry and other stakeholders in the aquaculture industry to ensure the industry develops in a sustainable way. This is achievable by tackling the following tricky areas of infrastructure provision, technologies availability and knowledge sharing, whereby Haryana can develop a sustainable aquaculture system. Having strong fundamentals will make the industry viable in long term, boost the economy of the rural population and sustainability of the environment. Finally, the results and conclusions of this study can also be used to advance the strategic interventions and strengthen Haryana as a leader of the fisheries industry in India and overall development socio-economically.

## **Conclusion:**

An analysis of aquaculture in the state of Haryana points out to the great strides that the state has taken to ensure that it dominates the Indian fish industry. Enhancement of economic potential fish farming or promoting a sustainable growth has also been made possible by technological innovations, and the application of best practices. With the adoption of top-level breeding technology, effective pond management strategies, enhanced feed technology and digital monitoring equipment, the productivity and fish health improved, and so has a more nature-sustainable orientation. There are, however, challenges that have continued to emerge, especially in the extension of these improvements to the small-scale farmers as well as bridging the infrastructural gaps that have been associated with the marketing sector as well as the post harvest activities.

## **References:**

- Abbott,G, James (2007). Market resource Links and Fish Vendor Livelihoods in the Upper Zambezi River Floodplains. *Human Ecology*. Vol.35, No. 5, pp.559-574.
- Dey,Madan,Mohan; Rab,A,Mohammad, et.al. (2005). Fish consumption and food security: A disaggregated analysis by types of Fish and classes of consumers in selected Asian Countries, *Aquaculture Economics and Management*, Vol. 9, Issue 1&2, pp. 89- 111.



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- Goswami, M (2015). Fish Farming Through Community Participation in Assam. *The ICLARM*, Vol.23. No.3 pp. 29- 32.
- Hapke, Holly, M (2001). Petty Traders, Gender and Development in a South Indian Fishery, *Economic Geography*, Vol.77, No. 3, pp. 225- 249
- Nabi, Rashed (2008). Constraint to the adoption of Rice-Fish Farming by Smallholders in Bangladesh: A Farming System Analysis. *Aquaculture Economics and Management*, Vol.12, Issue 2, pp. 145- 153.