



Tamil Nadu Veterinary and Animal Sciences University
Directorate of Extension Education
ICAR - KRISHI VIGYAN KENDRA
Veterinary College and Research Institute Campus,
Namakkal - 637 002.

A Case Study on Backyard Ornamental Fish Rearing in Namakkal District



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भाकृअनुप-कृषि तकनीकी अनुप्रयोग अनुसंधान संस्थान (अटारी)

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Technical Bulletin

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ICAR-Agricultural Technology Application Research Institute (ATARI Zone-X)
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डॉ. शेक एन. मीरा
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निदेशक/ Director

Foreword

Ornamental fish farming, or *aquaculture*, is an emerging sector in India that offers a low-investment, high-return enterprise model, particularly suited for small-scale and backyard operations. In Namakkal district, Tamil Nadu—already well known as a hub for poultry and egg production—backyard ornamental fish rearing has steadily gained recognition as a promising micro-enterprise. This activity has proven especially beneficial for women self-help groups and rural households, creating livelihood opportunities and supplementing household incomes.



This case study highlights the forward linkages that connect small-scale ornamental fish producers with the broader value chain. It demonstrates how backyard ventures, even with modest investments, can successfully integrate into markets while contributing to local economic empowerment.

I appreciate the dedicated efforts of the KVK, Namakkal team, who since 2015 have been promoting backyard ornamental fish farming through training and capacity-building programs. More than one thousand trainees—including youth, farm women, and farmers from various districts of Tamil Nadu—have benefitted from these initiatives and adopted ornamental fish culture. With an initial investment as low as ₹500, this enterprise has attracted nearly 80% of trainees, who have taken up fish rearing after receiving hands-on training from KVK.

The present technical bulletin on *Backyard Ornamental Fish Culture* is a well-prepared and concise documentation of these experiences. It serves as a valuable resource for institutions and entrepreneurs seeking to strengthen ornamental fish farming as a sustainable self-employment activity. The authors deserve commendation for bringing out this bulletin in a practical and user-friendly manner.

SHAIK N. MEERA
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Introduction

Aquarium keeping is the second largest hobby in the world next to photography and the ornamental industry is fast gaining importance due to its tremendous economic opportunities and prospects. India has enormous potential in ornamental fisheries owing to its species and ecosystem diversities. But ornamental fisheries in India are a neglected sector and remained untapped due to various reasons (Bojan, 2005). They are frequently referred to as “Living Jewell” because of their color shape, and behavior. Ornamental fish preservation at domestic is rising as one of the maximum famous interests in the world. The entire supply of Indian ornamental fish is primarily dependent on wild catch (85%) and a few artificially bred varieties of exotic fish (15%). Thus generating employment opportunities for the urban and rural youth. The disease outbreak is the bottleneck during raising and developing the brood stock and also during breeding and rearing. The number of potential hazards especially disease infestation and attack by parasite and predator is frequently encountered causing heavy mortality. These diseases would often inevitabl lead to diminishing profit margins and would slow down the growth of the industry. There is a need to identify these elements for proper intervention and taking precautionary measure for the successful commercial production.

The top exporting countries during 2021 - 2022 was Singapore followed by Japan, Thailand, Malaysia, Israel, Indonesia, Netherlands and Sri Lanka. The countries of Asian

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Sub-Continent contribute about 56% to global ornamental fish export. However, contribution of India in global trade remains below 1% (US\$ 1.16 million) of the total. India has indeed been exporting unique varieties of wild-caught ornamental fish to many developed countries for several decades. The country has a rich diversity of freshwater ecosystems, which has contributed to the availability of a wide range of ornamental fish species. Among the fresh water fishes, 98% are cultured and only 2% are captured from wild.

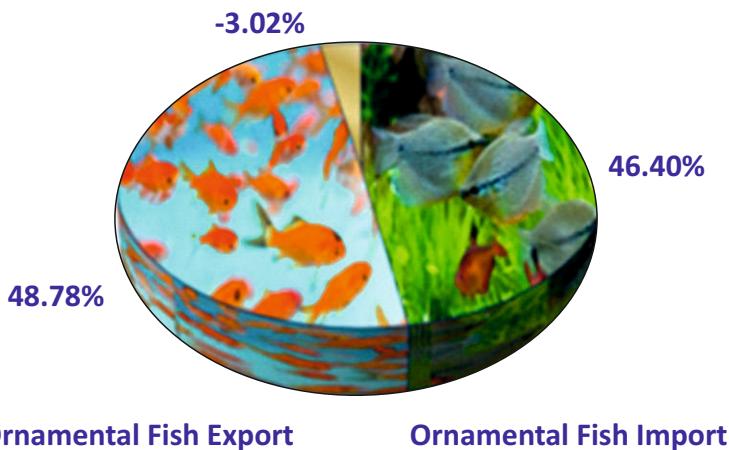
The concept of economic growth, which is a process of increasing a country's output over a period of time, has become one of the key indicators used to measure the country's progress (Todaro, 2005). Economic growth refers to the expansion of economic activities within a society that result in an increase of goods and services being produced. This overarching growth is measured through the capacity of the Gross National Product (GNP) or Gross Domestic Product (GDP). It provides an overview and information on the extent to which economic activities will generate income for the community in a given period (Sukirno, 2010). The Indian ornamental fish was observed at a 22.87 percent growth in the year 2013-14, followed by a 17.72 percent growth in the subsequent year, 2014-15. There was a significant rise observed in the year 2017-18. Nonetheless, there was a notable decrease of 4.41 percent noted in the year 2022-23.

The culture of freshwater ornamental fishes is mainly limited to the states of West Bengal, Tamil Nadu, Kerala,

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A case study on backyard ornamental fish rearing

Maharashtra and recently Karnataka. Tamil Nadu is the second largest ornamental fish producer in the country after West Bengal. The village of Kolathur near Chennai is the epicenter of ornamental fish production of large varieties. The similar trend is being followed in Madurai, another major business city in Tamil Nadu.



Ornamental Fish Species:

Two categories of ornamental fishes are being marketed - exotic ornamental fish and native fish of India, which have ornamental value for coloration or behavior. Exotic fish dominate the domestic market. Already 288 exotic varieties have been recorded in Indian market. More than 200 species of these freshwater fish are bred in different parts of India and others still have to be imported as fry. According to availability, demand, and climatic conditions the ornamental fish farmers of West Bengal are

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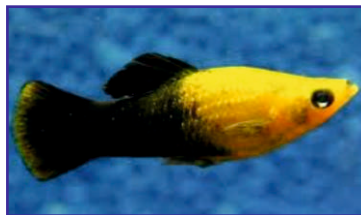
mainly engaged in breeding and rearing of common exotic live bearers and egg layers. The egg layers lay sticky or non-sticky eggs on the glass wall or aquarium plants. Some parents show parental care and some destroy their eggs so different breeding setups are needed. Live bearers release young once in batches and are easy to breed. Among the preferred fish, there are common exotic

Table:1. Live bearers

Common name	:	Scientific name
Guppy	:	<i>Poecilia reticulata</i>
Molly	:	<i>Poecilia latipinna</i>
Swordtail	:	<i>Xiphophorus helleri</i>
Platy	:	<i>Xiphophorus maculatus</i>



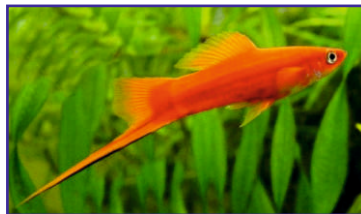
Guppy
(*Poecilia reticulata*)



Molly
(*Poecilia latipinna*)



Swordtail
(*Xiphophorus helleri*)



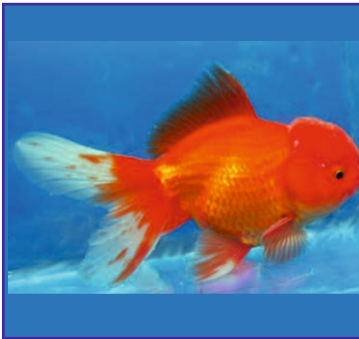
Platy
(*Xiphophorus maculatus*)

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Table:2. Egg layers

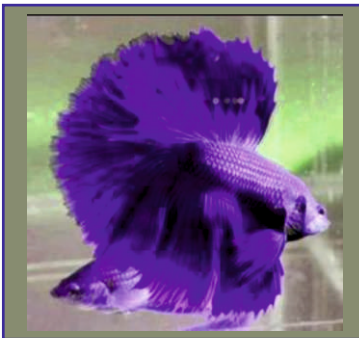
Common name	:	Scientific name
Gold fish	:	<i>Carrassius auratus</i>
Koi carp	:	<i>Cyprinus carpio</i>
Tiger barb	:	<i>Puntius tetrazona</i>
Siamese fighter	:	<i>Betta splendens</i>
Serpae tetra	:	<i>Hyphessobrycon serpae</i>



Gold fish
(*Carrassius auratus*)



Koi carp
(*Cyprinus carpio*)



Serpae tetra
(*Hyphessobrycon serpae*)

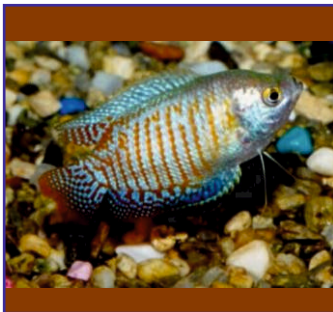


Siamese fighter
(*Betta splendens*)

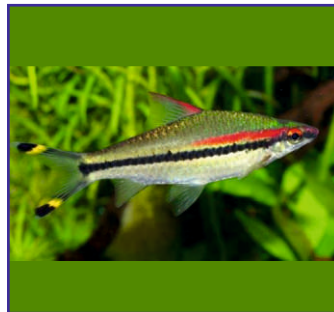
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Table:3. Native ornamental fish

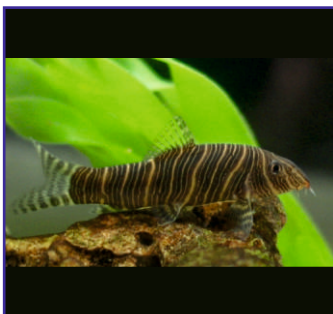
Common name	:	Scientific name
Honey gourami	:	Colisa chuna
rosy barb	:	Puntius conchonius
zebra fish	:	Brachydanio rerio
glass fish	:	Chanda nama
Reticulate loach	:	Botia lohachata



rosy barb
(*Puntius conchonius*)



Honey gourami
(*Colisa chuna*)



Reticulate loach:Botia
lohachata



zebra fish
(*Brachydanio rerio*)

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Presently only about 52 native fish species from West Bengal have been earmarked as aquarium fish. Farmers use their facilities to breed a range of species shifting with the season.

Success stories of ornamental fish growers Farmer Background:

Mr.M.Sathasivam, S/o.Manickam, No.1/93/A, Mariyamankovil street, Sappaiyapuram, Namakkal (District). This technique involves production of ornamental fishes in pools holding less than 1000 liters water or in used refrigerator/ fridge containers with 100-200 liters capacity. The pools are setup using used flex or Silpaulin sheets. They are constructed at elevated area or at a higher terrain so as to facilitate water exchange by gravity. At weekly interval 20 % of bottom water is exchanged and this water is used for irrigating plants. This integrated farming approach uses more crops per drop of water. The pools for fish culture can also be erected on roof top of house employing wooden frames or at backyard using bricks / laterite stones.

The technology employs utilization of used fridge boxes which are often thrown as scrape after removal of metal part. The holes in the rigid foam/plastic (poly urethane/ polystyrene) can be easily sealed with adhesives like m-seal or by plastering with cement. Such fridge boxes are ideal for culturing live bearers fishes and for breeding egg laying fishes like gold fishes, Koi carps, Tiger barb, Oscars etc. These containers are as good as fiber tanks which can cost up to Rs.4000 for same dimension. The rigid foam facilitates stacking of boxes one above other thus enabling effective

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utilization of floor area. The cost of these fridge boxes in scrap market range from Rs.750 to Rs.850. There are specialized scrap dealers who effectively separate the metal part without damaging the inner foam in namakkal and sell these containers for culturing fish. On an average Rs.2500 can be earned from these boxes in a year by culturing ornamental fishes. The farmer can anytime sell back the boxes as scrap if any damage occurs, thus getting maximum benefit from it.



Fridge boxes



Fiber Glass reinforced
plastics (FRP) tank



Silpaulin sheets used for making fish tanks

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Various varieties of freshwater live bearer fishes like guppy (*Poecilia reticulata*), Platy (*Xiphophorus spp.*), Molly (*Poecilia latipinna*) or Swordtail (*Xiphophorus helleri*), which belong to the family poecillidae are cultured by this method. These small size fishes with less than 10 cm length reach marketable size in four months and give assured income to farmers.

Similarly used flex banners or sheets can be used for culturing ornamental fishes as a backyard activity or on roof top of concrete houses. These can be a replacement for conventional concrete pools. Flex banner and hoardings that are flooding in our society are rarely recycled. They are mostly re-used for roofing purpose and for this only large size sheets are used. These flex sheets meant for roofing are easily available in shops, but the smaller size are often discarded after use. Even these small flex sheets can be used for cultivating aquatic plants used in aquarium and for culturing ornamental fishes. The pools need to be constructed at elevation or at a higher terrain so as to facilitate water exchange by gravity. They should be covered with net to protect the fishes from birds and other predators. Excess algal bloom can be controlled by covering the tanks with shade nets.



Visit to commercial Ornamental fish units by women entrepreneurs from kvk Namakkal

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Scaling up of technology and its Impact

KVK is regularly giving training (On and Off-campus) on breeding and culture of ornamental fishes and also conducting On Farm Trials (OFT) and Front Line Demonstration (FLD) to Sappaiyapuram Alampalayam and Muttanchetti in Namakkal district farmers Tamilnadu. During the training programme the trainees are given hands on training on various aspects of ornamental fish culture including the breeding, culture of ornamental fishes, fish feed preparation, aquarium tank, hood construction, water quality, disease management etc.



Distribution of critical inputs to Ornamental fish growers

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**Distribution of critical inputs to
Ornamental fish growers**



Field visit by KVK Scientists

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Field visit by KVK Scientists

More than one thousand trainees including youth, farm women and farmers from various districts of Tamil Nadu have undergone this training at KVK Namakkal and are practicing fish culture. This low investment technology taught to them enables them to start the unit with a minimum investment for Rs.500. Nearly 80% of the trainees have fancied fish culture after attaining training at KVK due to its low investment nature. Mrs.Dhanam W/o.Mr.Kandasamy, No.23, Ambedkar Nagar, Muttanchetti ,Erumaipatti(Block), Senthamangalam(Taluk), Namakkal district had started her unit with the low investment techniques after attaining training from KVK and then she expanded her unit to a hi-tech one. The confidence and profit gained from the low investment venture enabled her to expand the unit with financial assistance from Pradhan Mantri Matsya Sampada Yojana (PMMSY).

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Average cost and returns of a breeding and rearing unit of live bearer

Capital cost(A) (Rs.)		
2 Fridge boxes (2.5 x 2 x 1) m each with lids and fittings	@1400.00	2800.00
3 Silpaulins sheets (5 x 3 x 2) m	@1200	3600.00
Aerator -1nos	@12000	12000.00
Other equipments like hand net, buckets, pipes		1200.00
Land lease per year	@36000	36000.00
		55600.00
Culture cost(B) (Rs.)		
200 female	@3.00	600.00
50 male	@5.00	2500.00
Feed for one year		4200.00
Others		1500.00
		8800.00
Total cost(Rs)(A+B)		64400.00
Monthly production of 5,000 young Yearly production of 60,000 young 40% male = 24,000 60% female = 36,000		
Sale(C)Rs.		
24,000 male	@3.25	78000.00
36,000 female	@3.50	126000.00
Total sale		204000.00
Annual profit = (204000 – 64400.00) = 139600.00		
Monthly profit = Rs. 11633.33		

Exposure visit-

Fish farmers attending an exposure visit to an ornamental fish unit is mainly to gain knowledge transfer, skill development, and networking to improve their own business. The visit provides practical, hands-on learning that goes beyond classroom instruction, allowing farmers to see successful operations firsthand.



Visit to Commercial Ornamental fish units at Dindigul

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Similarly the case study with Mrs. Ramya chidhambaram from Kalkurchi Many other farmers like Mrs. Sumathi Arumugam, Miss.Kalaiselvi. Mrs.Kavya shanmugam. and Mr. Rajeesh K of Namakkal district have established their units in this manner and have become successful entrepreneurs. In continuation, KVK with the funding support from ICAR-ATARI, Hyderabad, Government of India has empowered 12 rural women in the district by providing them a sustainable livelihood through ornamental fish culture adopting the low investment culture techniques. Two women self help groups (Angel JLG (Reg. No.24/16-17/PBA and Jaya activity group Reg. No. 110/708/01/164) have been formed under the Pradhan Mantri Matsya Sampada Yojana (**PMMSY**) and these women have been marketing their produce through the sales counter at Mettur dam. They are also involved in preparing and selling ornamental fish feed. The women have been earning a monthly income of Rs.2000-5000 from this part time activity. KVK also been setup an ornamental fish sales unit with the facilities of aquarium to stock their fish and fish feed preparation facility at KVK campus itself for the benefit of ornamental fish entrepreneurs.

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Packing of Ornamental fish fingerlings

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Bank manager meet with Ornamental fish growers at KVK,Namakkal

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After regular monitoring and technical support by KVK experts, More than 68% of the total women beneficiaries successfully run their ornamental farming units and 42% of women started marketing regularly. The successes rate at Salem, Erode and Bangalore are higher than other clusters. The township in the neighborhood and effective market communication could be the cause of this. Several factors influence the success scenario of the ornamental fish culture industry run by women (The factors are-Economic conditions, Social structure, Institutional structure and Legal factors).

Food and feeding

Feeding habits of ornamental fish vary depending on the species, but proper management focuses on providing a balanced diet, determining the right feeding amount and frequency, and understanding species-specific needs. Overfeeding is a common mistake that causes poor water quality and health issues, including stress, disease, and death.

Common signs of stress and disease in Ornamental fish growing tanks

Improper buoyancy	Off feed
Scale loss	Lethargy
Changes in color	Isolation
Reddened /ulcerated areas on fins/body	Increased respiratory rate
Lumps and bumps on the skin and fins	Flaring of the gill covers
Clamped fins	Pale gills
Loss of mucous on the skin	Excess mucus production – skin & gills
Sunken eyes	Brown or black patches on the gills
Gasping at surface	Bleeding from the gills, loss of gill tissue

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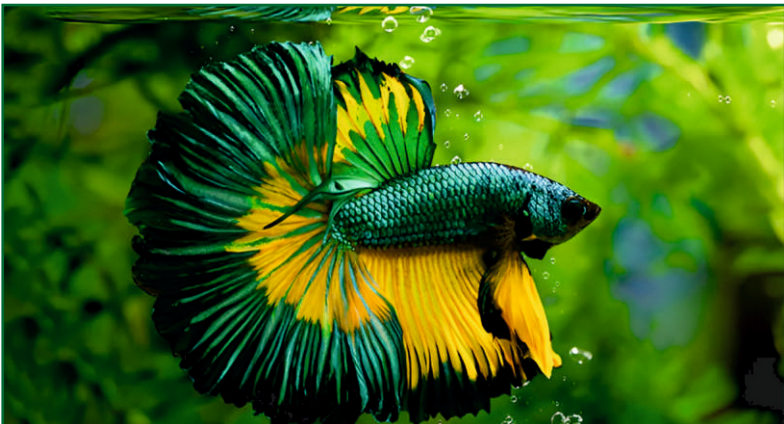
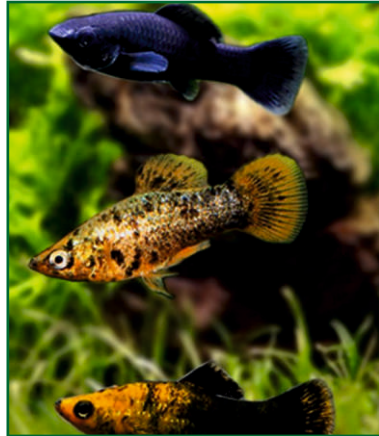
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Conclusion:

Ornamental fish culture represents an innovative farming technology that requires minimal time and investment while yielding high profits, in addition to enhancing water productivity, to empower and motivate rural women and to provide self-employment opportunities. In India, many women have taken up ornamental fish breeding and farming as a backyard activity, especially in rural areas. When the women of the family start their earnings, the literacy percentage increases in that society. The small income of a housewife can contribute to their children's education, health and hygiene. Considering the proven success of women in developing backyard ornamental fish farming in different rural parts of India, it is necessary to encourage them to create self Help Groups for their livelihood improvement.

The success of women in developing homestead ornamental fish farming businesses is encouraging other self help group and NGO to initiate such enterprises. Women are well-suited to ornamental fish farming because of their inherent patience, but only if they are properly educated. Significant support is required to unlock women's existing and latent empowerment in this sector. More opportunities must be created for women, predominantly through collecting and disseminating information and transferring scientific technology between different states of the country.

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