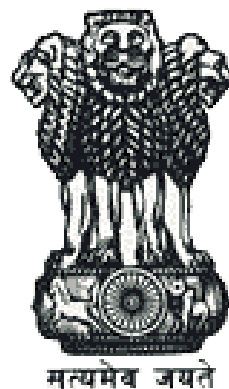


PROMOTION OF ORNAMENTAL FISHERIES UNDER PMMSY



Government of India

Ministry of Fisheries, Animal Husbandry & Dairying

Department of Fisheries

Ornamental Fisheries: Global Status

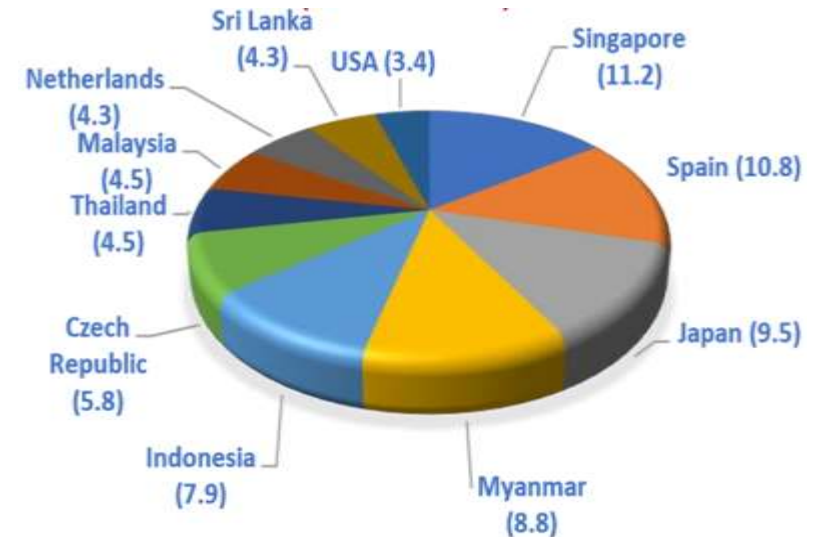
2nd most popular hobby: 100 million hobbyists in the world.

- Important economic activity in **125 countries**
- Global trade \approx **US\$ 18-20 billion**
- **Over 2500** fish species (60% freshwater & 40% marine)
- Main sps. Neon tetras, Aangels, Gold fish, Danios and Discus
- Guppy and Zebra danio contributing to > 14% trade
- **Sri Lanka** occupy the 6th position in the world
- **India's share** to global ornamental fish export = **0.4%**
- **India's rank** is **31st** in exporting countries

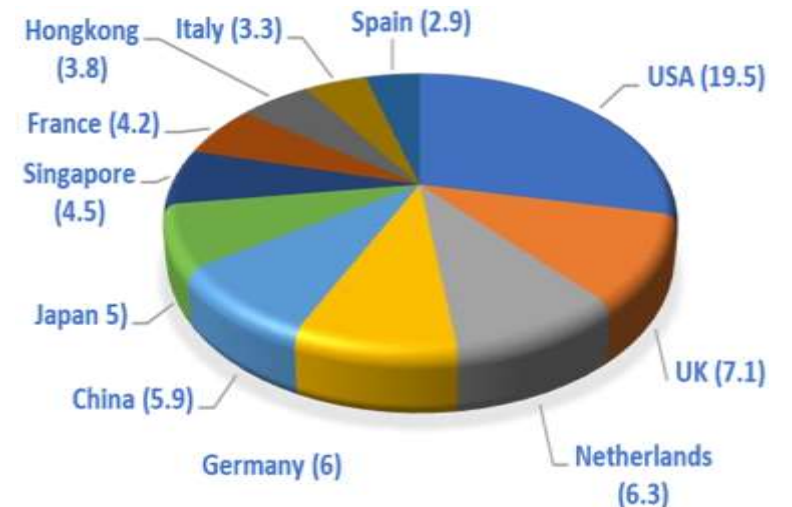
Singapore The top exporting country in the world

European Union the **largest market** for ornamental fish

United States Single largest importing country



Global ornamental fish export, 2017

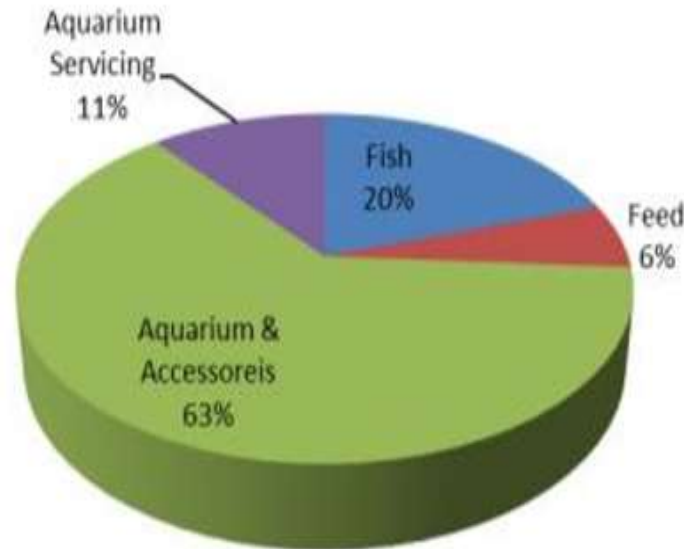


Global ornamental fish import, 2017

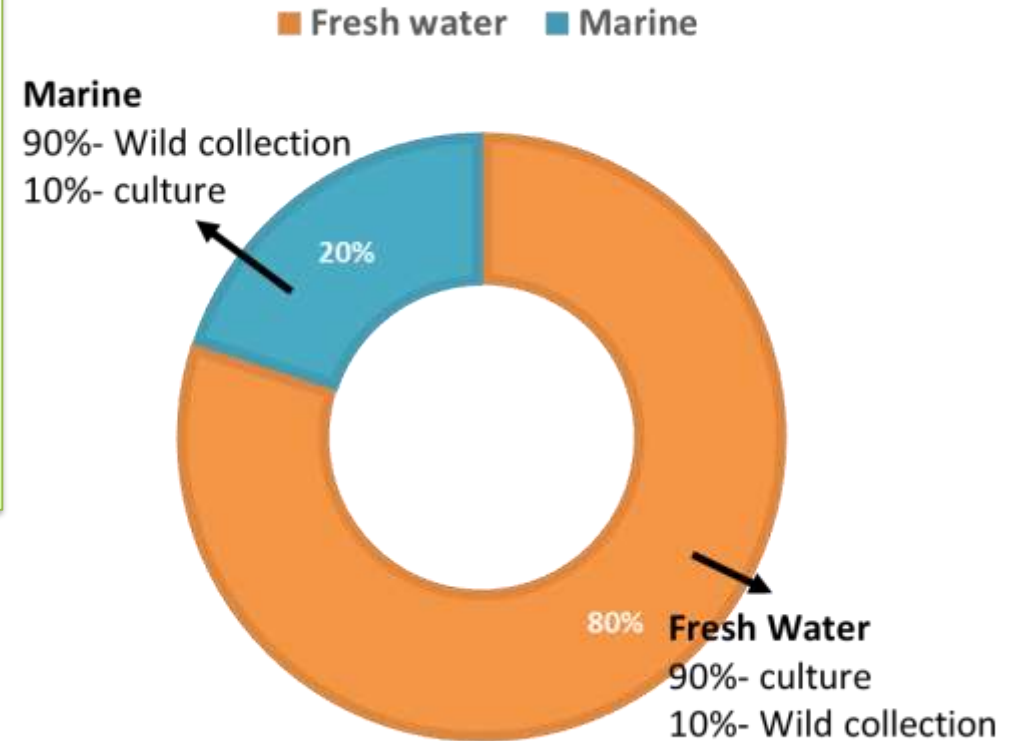
Indian Scenario: Domestic Aquarium trade

INDIAN ORNAMENTAL FISH TRADE

- ❑ Indian Ornamental fish has great demand in International market
- ❑ High biodiversity ≈ 374 indigenous freshwater fish species
- ❑ About 700 indigenous and >300 exotic marine fish species
- ❑ 80% trade from Freshwater; 20% from brackish & marine water
- ❑ **Domestic** ornamental fish trade about **Rs. 500 crore**
- ❑ **Export** trade **Rs. 8.40 Cr** (2017-18) with **11.6%** per year growth
- ❑ **5,000** production units, in West Bengal (55%), Tamil Nadu (30%), Kerala (5%), Maharashtra and others (7%), North East and Island (3%).



Indian Domestic aquarium trade



Increasing per capita income

Increasing middle-income group

Increasing nuclear families in metro cities

**Tremendous Scope
for Growth**

Urban population will rise to **42.5%** (547 million peoples), in 2025-26.

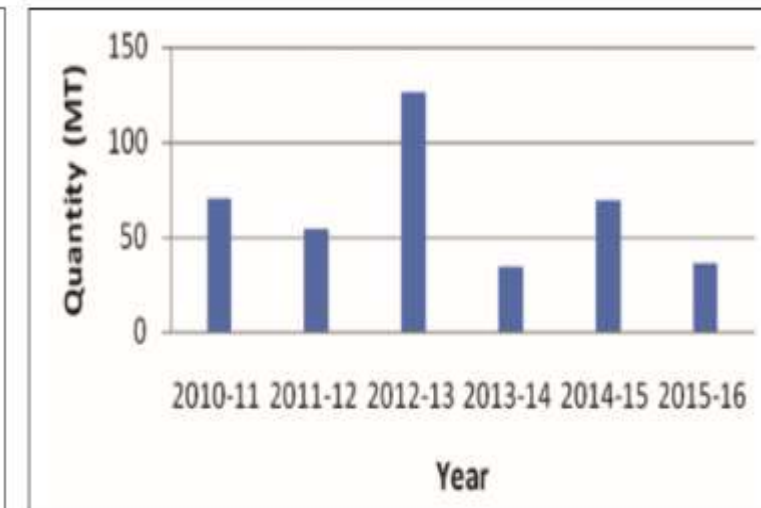
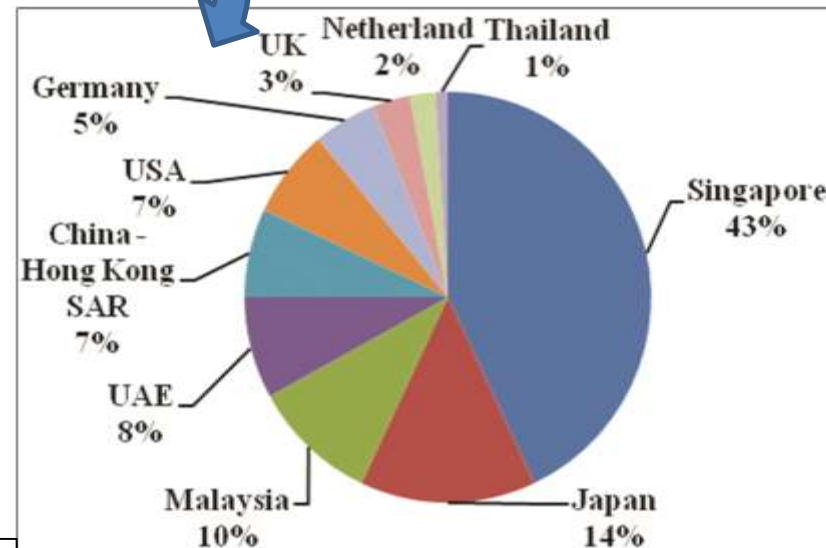
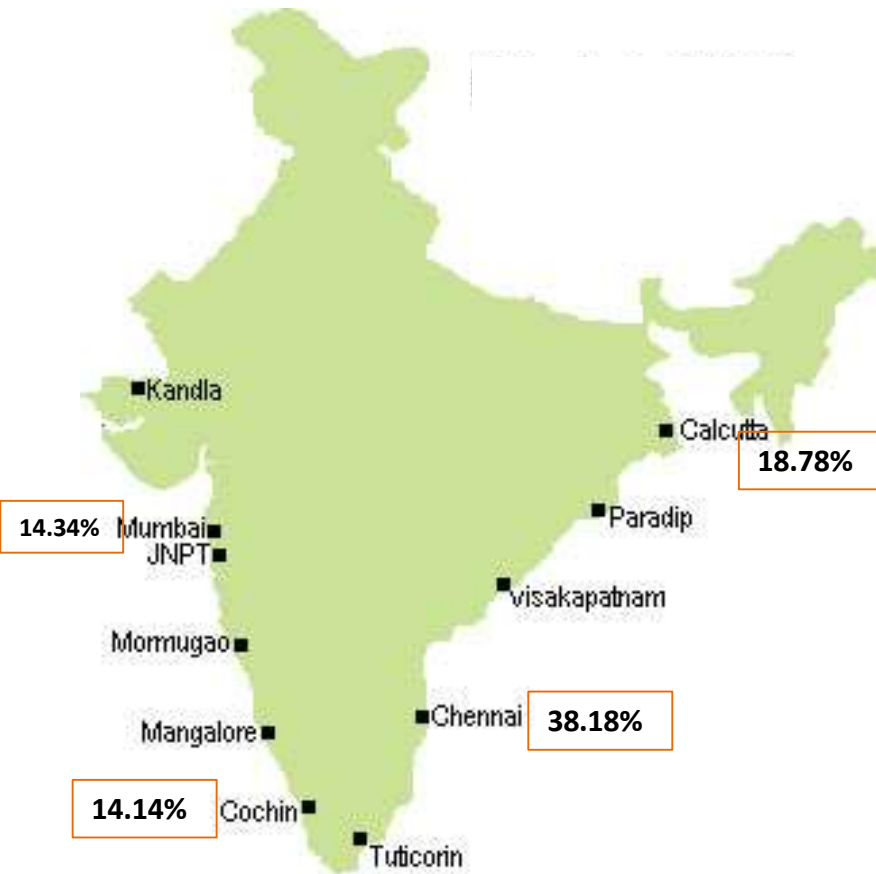
Indian Scenario: overseas trade

Indian Ornamental fish trade

0.4% (US\$ 1.4 million) of the total world.

Despite its great potential, India **ranks very low** amongst Asian countries that export ornamental fish to the world. Major fish exported from India are of **wild varieties** collected from rivers of North-east and southern states.

35 MPEDA authorized Ornamental Fish Exporters



Major Destinations for India's Ornamental Fish Export during 2003-2009 (NFDB, 2017)

Quantity-wise Ornamental Fish Export from India during 2010-2016 (NFDB, 2017)

Ornamental fish export (quantity) during the period 2004 to 2011 (Dominic *et. al.*, 2013)

Freshwater ornamental fisheries

Wild collection

Most of fish **exported from India** are of **wild varieties** collected from rivers of the Northeast and Southern States.

Culture

India possesses rich resources viz., rivers, streams, the lagoons and coral reefs with highly attractive and varied species of ornamental fishes.

4 BIODIVERSITY HOT SPOTS PRESENT IN INDIA



6,000 aquarium shops

10 lakh Aquarium hobbyists

the North East region:
It contributes **85%** of total market ;
250 ornamental fish species present,
58 indigenous fishes are exported.;
Main Sps: Botia dario, Dania dangila,
Puntius shalynius and Schistura
reticulofasciatus

155 ornamental fish species present
117 are endemic to **Western Ghats**
Main varieties: barbs, rasboras, killifishes,
glass fishes, catfishes, catopra, hill trouts, and
danios.

- Majority **fish breeders in India** breed **Exotic fishes**, very few breed indigenous fishes.
- About **13** indigenous freshwater ornamental fish species successfully bred, mostly from **backyard breeding and rearing units, small size & cluster based production units.**
- Goldfish:** highest preference among hobbyists and most **dominant species** in India.

Major Breeding Centres (MPEDA authorized)

Kerala	126
Tamil Nadu	44
Mathya Pradesh	11
Himachel Pradesh	10
West Bengal	8
Maharastra	7
Rajasthan	4
Karnataka	2
Total	212

(Inland & Marine)

Major indigenous ornamental fish species in India

Indigenous Freshwater Ornamental Fishes



Puntius auratus



Puntius filamentosus



Aplocheilichthys panchax



Amblypharyngodon mola



Channa orientalis



Garra gotyla gotyla



Gonoproktopterus curmuca



Macrogynathus arol



Nandus nandus



Notopterus notopterus



Horabagrus brachysoma



Mystus vittatus

Indigenous Marine Ornamental Fishes



Pomacentrus caeruleus



Ostracion cubicus



Scarus ghobban



Odonus niger



Narcine timlei



Chelonodon patoca



Thalassoma lunare



Abudefduf saxatilis

Trends in Ornamental fish culture centres in India

The culture of freshwater ornamental fishes is mainly limited to the states of West Bengal, Tamilnadu, Kerala, Maharashtra and recently Karnataka.

A few units of freshwater ornamental fish production are also established in inland states of **Rajasthan** and **Madhya Pradesh** during the last decade.

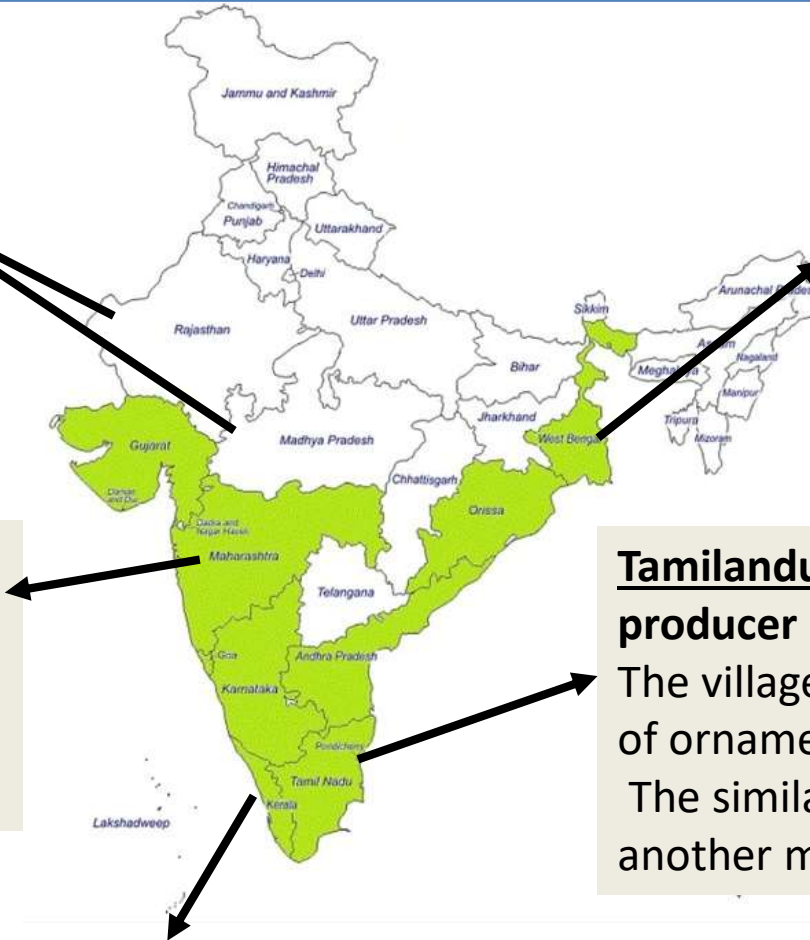
West Bengal : Largest ornamental fish producer in India.

A large number of villages in districts of 24 pargana, Howrah, Hooghly and Nadia are major centres of ornamental fish culture in the state of West Bengal.

Mumbai (Maharashtra) was known for culture ornamental fishes about two-decade backs but now it is mainly popular for high value fishes specifically **Discus only**.

Tamilnadu: is the **second largest ornamental fish producer** in the country after West Bengal. The village of **Kolathur near Chennai** is the epicentre of ornamental fish production of large varieties. The similar trend is being followed in Madurai, another major business city in Tamilnadu.

Kerala: is fast becoming popular for ornamental fish culture as many villagers in the districts of Thiruvanthapuram, Ernakulum, Thrissur, Allapuzha and Kottayam has set up **backyard ornamental fish production units**.



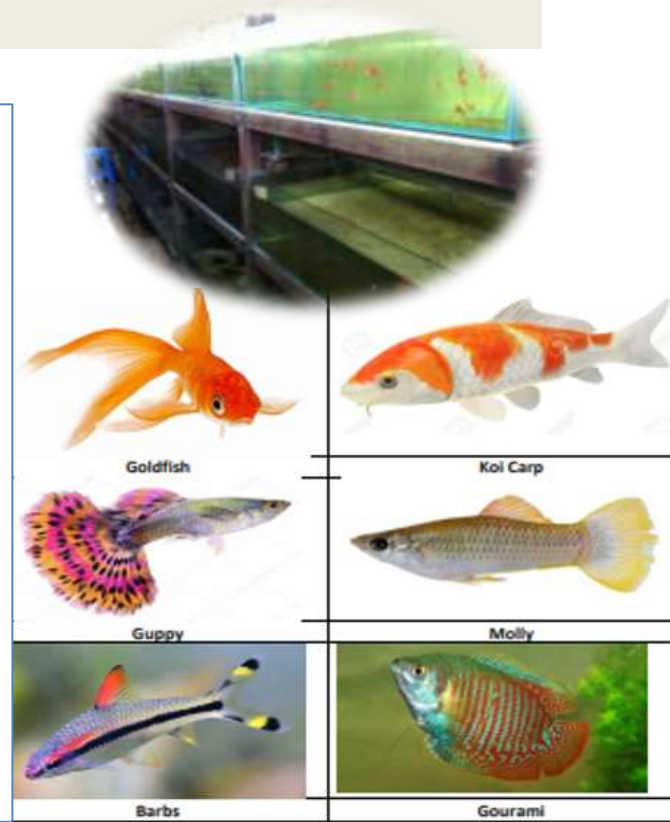
Breeding of Freshwater Ornamental Fishes



Ornamental fish Production technology in India

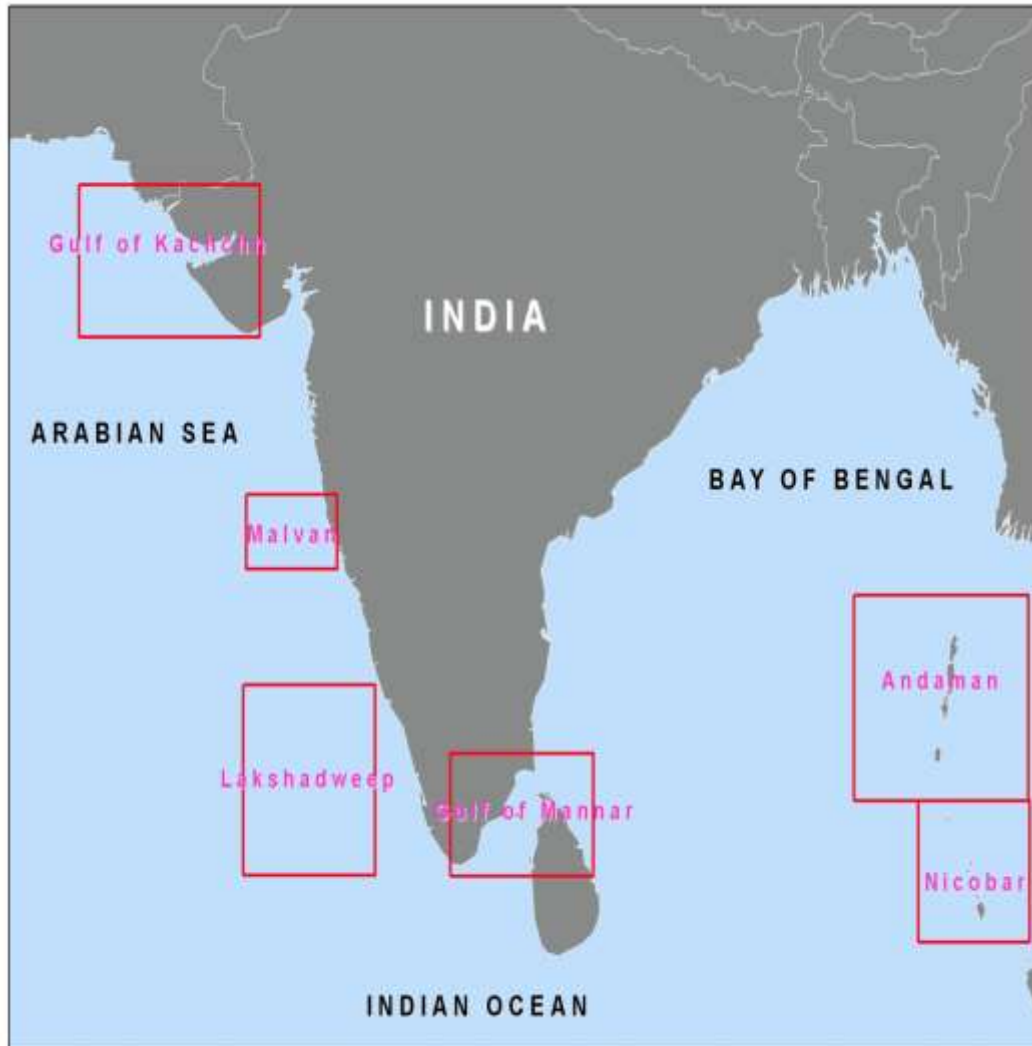
The ornamental fish production practices in country are characterized by:

- mainly based on **Low-input: Low-output concepts** and developed in a cluster.
- The production system is based on **excess input in terms of labour** but **less in terms of money**, material and management.
- The **cost of labour is usually not calculated** and given much importance in backyard production units hence the **total cost of the marketable fish is less**.
- The breeding and culture of only low (**Guppy, Platy, Molly, Widow tetra, Rosy barb, Koi carps**) and medium value (**Gold fish, Gouramies, Angels, etc.**) fishes is commonly practiced in the country.



- The breeding of high and premium value fish is performed by few breeders only and that to in limited quantity.
- It is because of the lack of technical expertise, small size of the production units as well as limited market demand of high and premium value fishes.

Marine Ornamental fisheries



Potential sites for marine ornamental fish collection in India.

India possesses rich marine ornamental fishes in lagoons and coral reefs of **Lakshadweep, Andaman and Nicobar Islands, Gulf of Kutch, Coast of Kerala, Gulf of Mannar** and **Palk Bay**.

113 finfish species in Gulf of Mannar,

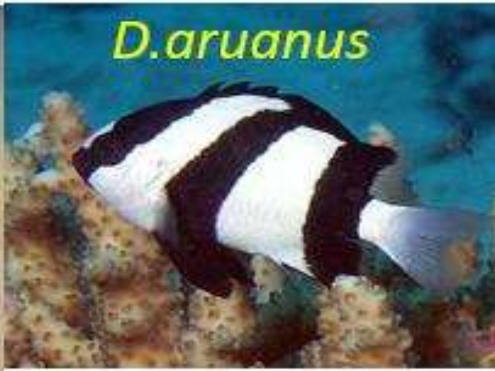
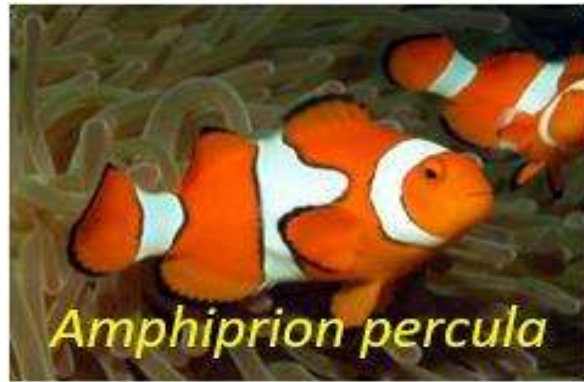
150 species in Andaman and Nicobar Islands

300 species in Lakshadweep Islands

Hatchery technology developed for **14** species by CMFRI



Breeding of Marine ornamental fish



Marine ornamental fish breeding and seed production scenario in India

The Central Marine Fisheries Research Institute(ICAR-CMFRI) is the leader in Research and development in captive breeding of marine ornamental fishes in India.

Development and standardization of **broodstock development, breeding and larval rearing** technologies

Research made in this effect in CMFRI hatcheries has resulted in the development of hatchery technology for **more than 20 species** and **cross-breeds** of marine ornamental fishes so far.



During 2018-19:

Percula clown

Tomato clown

Skunk clown

Maroon clown

percula cross-breeds

picasso platinum

snow flake

ocellaris cross- breeds

black ocellaris

damsels

Activities of CMFRI during 2018-19 towards marine ornamental fisheries

In order to boost the ornamental fish industry, a **National Network Research Project with CMFRI** in the lead has been launched with **seven collaborating fisheries Institutes** on ornamental fish breeding and seed production.

Training and capacity building programs on Marine Ornamental Fish Culture were carried out at selected villages of Tamil Nadu.

Green certification of marine ornamental fish has also been initiated.

'Varsha' series of freshwater ornamental fish feed refined for commercial production.

'Varna' series of marine ornamental feed production and sale touched an all-time high

Revenue generation was to the tune of **Rs. 2.297 lakhs** through the sale of marine ornamental fish.

Recent Initiatives towards Ornamental Fisheries Development in India



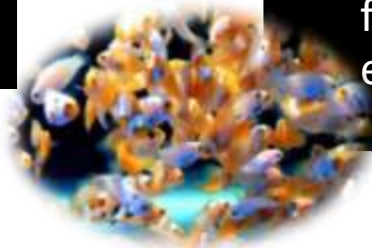
NFDB

- ⑩ provided financial assistance towards development of ornamental fisheries in the country for establishment of
- ⑩ backyard rearing units, medium scale rearing units,
- ⑩ integrated (breeding-cum-rearing) units,
- ⑩ aquarium fabrication units and
- ⑩ ornamental fish markets



CMFRI

- ⑩ Initiated preparing a document on green certification of marine ornamental fish.
- ⑩ Breeding and seed production techniques standardized for variety of Marine ornamental fishes and supply of fingerlings to farmers.
- ⑩ Production of *Varsha* series of ornamental fish feeds in commercial extruders.

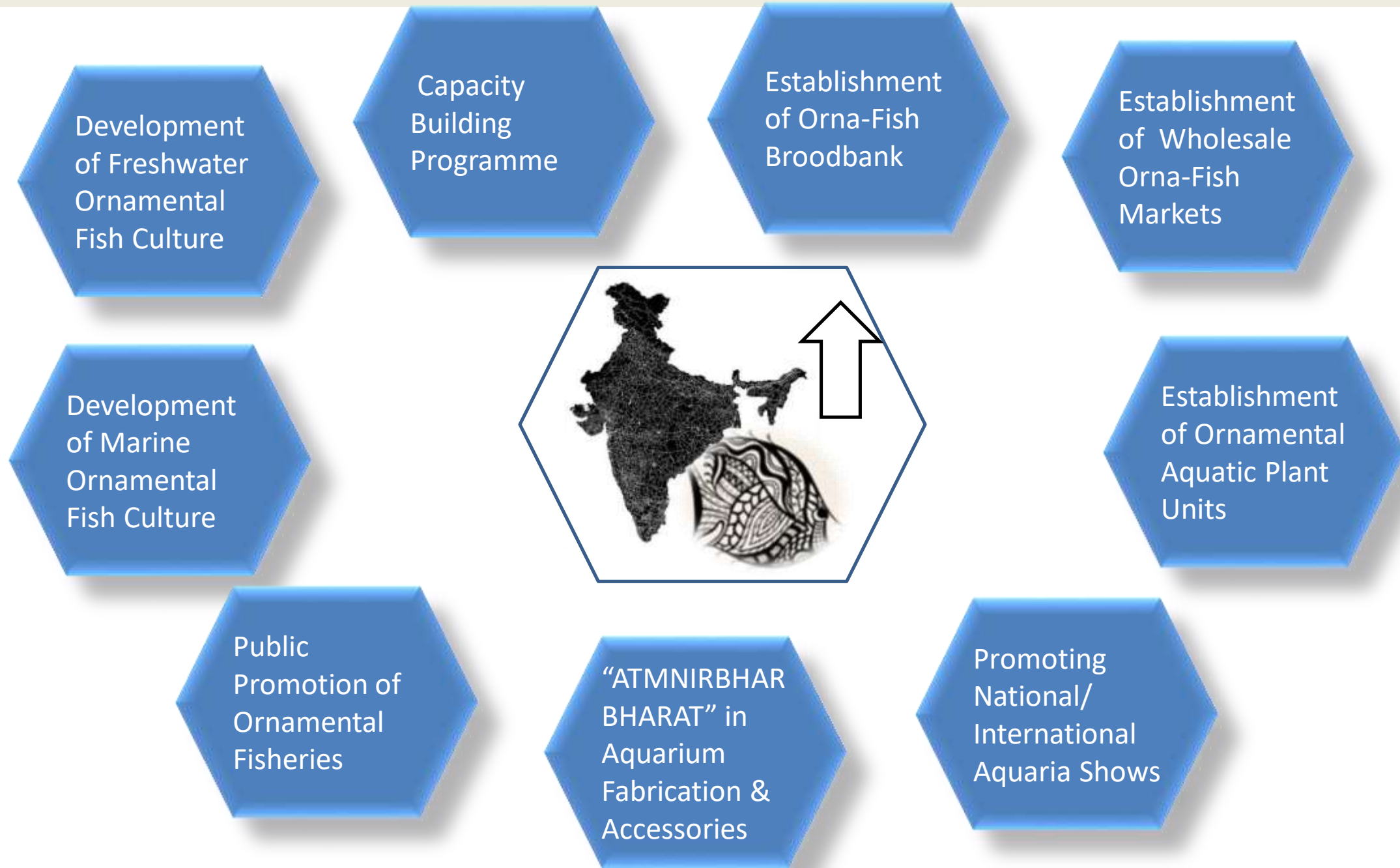


MPEDA

- ⑩ Organizing Domestic Fairs at various locations over the country to disseminate the vast potential of the fisheries, aquaculture and ornamental fish sectors.
- ⑩ Conducting skill development programmes in ornamental fish farming.
- ⑩ introduced a scheme to award incentives on export of ornamental fishes



Strategies for Developing Ornamental Fisheries Sector in the Country



Action Plan for Development of Ornamental Fisheries in India:

AQUARAINBOW VISION- 2030

MISSION

- Entrepreneurship & livelihood generation through development of ornamental fisheries and improvement in quality of life through promoting the hobby aquarium keeping

VISION

- The hobby of aquarium keeping becomes a highly popular hobby both in urban and rural house-holds.
- India becomes a leading producer and exporter of both freshwater and marine ornamental fishes and allied products.

OBJECTIVE

- To **support the income of farmers** and **generate livelihood earning opportunities** in rural India through introduction of ornamental fisheries activities.
- To provide **self-employment and entrepreneurship development** opportunities to **rural and urban youth** in the field of ornamental fisheries and allied sectors.
- To **empower & encourage women, SCs, STs, other economically weaker sections** of the society to substantiate their earnings.
- To **promote private sector investment**, augment **export** of ornamental fish from country and achieve a leading position in global ornamental fish trade.
- To **promote the hobby of aquarium keeping**, help the people of country to live a stress-free healthy life and improve the quality of life.

Financial Resources: Ornamental Fisheries

- **Rs. 576 Crore** investment : Under Pradhan Mantri Matsya Sampada Yojana (PMMSY)
- **Rs. 500 Crore** additional investments proposed under World Bank Scheme, that would catalyse about Rs.2500 Cr
- Marketing infrastructure under FIDF
- Government investments catalyse the growth of Private sector on its own to about Rs.10,000 Cr

PMMSY – 576 Cr INVESTMENT FOR ORNAMENTAL AND RECREATIONAL FISHEREIS

Name of activities	Approx. Unit Cost (Rs. In lakh)	Approximate Physical Quantities	Total Cost (Rs. in Crore)
Development of Ornamental and Recreational Fisheries			
Backyard Ornamental fish Rearing unit (both Marine and Fresh water)	3	1010	30.30
Medium Scale Ornamental fish Rearing Unit (Marine and Freshwater Fish)	8	707	56.56
Integrated Ornamental fish unit (breeding & rearing for freshwater fish)	25	404	101.00
Integrated Ornamental fish unit (breeding and rearing for marine fish)	30	303	90.90
Establishment of Fresh water Ornamental Fish Brood Bank	100	10	10.00
Promotion of Recreational Fisheries	DPR	DPR	25.00
Sub Total (A)			313.76

Name of activities	Approx. Unit Cost (Rs. In lakh)	Approximate Physical Quantities	Total Cost (Rs. in Crore)
Technology infusion and adaptation			
Establishment of large RAS (with 8 tanks of minimum 90 m3/tank capacity 40 ton/crop)	50	50	25
Establishment of Medium RAS (with 6 tank)	25	100	25
Establishment of small RAS	7.5	200	15
Establishment of Backyard mini RAS units	0.5	200	1
Live fish vending Centres	20	110	22
Fish Feed Mills(mini)	15	50	3
Markets and marketing infrastructure			
Construction of fish retail markets including ornamental fish/aquarium markets.	100	20	20
Construction of fish kiosks including kiosks of aquarium/ornamental fish	10	200	20
E-platform for e-trading and e-marketing of ornamental fish	Proposal/DPR based	5	5
Innovative activities, Start-ups etc (10 lakh Gold fish for girl child)	DPR		20
Genetic improvement	DPR		10
Aquapark + Aquarium			100
Total (B)			261
Grand Total (A+B)			556

Activities

- **Group A:** Activities related to production of ornamental fish (Setting up of production units including renovation).
- **Group B:** Activities related to Aquarium Fabrication, trade and marketing.
- **Group C:** Activities for promotion of ornamental fisheries sector through demonstration, establishment of public aquariums and organizing aquaria shows.
- **Group D:** Skill development and capacity building Programmes.

Potential for establishing aquaria in educational institutions

Number of Recognized Educational Institutions (EDUCATIONAL STATISTICS AT A GLANCE, MHRD-2018)

Level/ Year	(in hundred)				(In absolute number)	
	Primary	Upper Primary	Secondary	Senior Secondary	College	University
2015-16*	8405	4296	1395	1126	39071	799

Total number of
schools

15,22,200



Proposed expenditure (10% School):
Rs: 152.22 crore

Total number of
colleges

39,071



Proposed Expenditure:
Rs. 39.07 crore

Aquarium setting in
Schools, Colleges, etc.

*(Considering an Average unit cost for establishing a medium sized aquarium: Approximately Rs. 10,000)

Thank You