

Significance and history of aquaculture

Aquaculture

Refers to all forms of culture of aquatic animals ie. fish, shrimp, shell fish in fresh, brackish and marine environments.

Aquatic counterpart of agriculture: Blue revolution

Fish is an excellent source of protein, containing all 10 essential amino acids.

Objectives of aquaculture

- To boost national economy by way of increasing per capita production for per capita consumption and per capita income.

- To create employment opportunities
- To properly utilize the available natural resources.
- To uplift socio-economic status of people.
- To earn foreign exchange.

- To culture fishes of ornamental value (Black molly, Red sword tail, blue Gourami, Kissing Gourami for aquarist.



Black molly



blue Gourami



Kissing Gourami

- To culture larvicidal fishes with a view to control mosquito larvae.



Fish culture is prime branch of aquaculture

- **Fish do not spend much energy on temperature regulation:-** results in higher growth rate and greater production per unit.
- **Fish can convert food into body tissues more efficiently:** fish has high %age of protein.
- **The edible flesh percentage of fish is greater (80.9%)** than chicken (64.7%) and Beef (51%).
- **Fish is a prolific breeder:** has high fecundity.

History of aquaculture

The first fish pond:

4000 years ago first identifiable fish ponds were built by Sumerians in their temples followed by Assyrians and other races.

Ancient Sumerians kept wild-caught fish in ponds, before preparing them for meals

- **Egyptian's interest in fish culture:**

Ancient Egyptian tomb picture has *Tilapia* on it.

Egyptians have mummified important species



- **The Roman's interest in keeping fish:** Marcus Terentius Varro in *De re rustica* wrote about two kinds of fish ponds, owned by wealthy aristocrats (who used them to entertain guest).
- Red Mullet was favored as the color changes of dying fish were admired before the fish were cooked and eaten



Red Mullet

- Moray Eel were decorated with jewellery and fed on unwanted and errant slaves.



Moray Eel

The classic of fish culture by Chinese:

- “Classic of fish culture” (500 BC) was written by Fan Lei (politician turned fish culturist), where he cited that his ponds were the source of wealth.
- In 1243 A.D. Chow Mit of Sung Dynasty and Heu in 1639 A.D.- described collection of carp fry from rivers and methods of rearing.
- Earliest form of fish culture in China was that of **Common carp, *Cyprinus carpio*** (a Native of China).
- **Common name of *C. carpio* in chinese is Lee, which was the name of Tang Dynasty Emperor ‘Lee’.**



Chinese found other fishes ie. Chinese carps

- Grass carp (*Ctenopharyngodon idellus*)
- Silver carp (*Hypophthalmichthys molitrix*)
- Big head carp (*Aristichthys nobilis*)
- Mud carp (*Cirrhina molitorella*)

Culturing of these fishes together leads to POLYCULTURE.



Grass carp



Silver carp



Big head carp



Mud carp

Fish culture in Indo-China

- Fish culture system is called '**Pen**' and '**cage**' **culture** of catfishes originated in Cambodia. Flow through culture from fry to market size was developed through artificial feeding.

Aquaculture in Europe

- In Europe: *C. carpio* attained social and religious value as the fish flesh was a delicacy on special festive occasions, like Christmas.

Fish Culture in India

- In India fish culture practise comes from writing of Kautilya's **Arthshastra** (321-300 BC).
- King Someswara of Chanakya Dynasty described the methods of fattening the fish in ponds in work titled **Mansoltara**.
- After a long period of silence collection and transportation of carp spawn from rivers and stocking ponds was developed traditionally in Bengal, Bihar and Orrisa by the end of 19th centuray.

- Dr. Sunder Lal Hora helps in development of fish culture in bengal.
- **Indian Council of Agricultural Research (ICAR)**: started fisheries research scheme by State government and Universities on different aspects of Fish culture.
- There occur establishment of various research stations.

- **Central Inland Fisheries Research Station (CIFRI)**, Barrackpore, West Bengal in 1947.
- **Pond culture** substation of institute was started at Cuttack, Orissa, 1949.
- The **technique of Induced Breeding**- developed by H. Chaudhari and K.H. Alikunhi in 1957 to induce Indian major carps to spawn in confined waters.
- After 1970's- there occurred use of '**Second generation techniques**' including **mammalian hormones, steroids, antiestrogens, prostaglandins** to make cultivated species spawn for seed production.

- **Central Institute of Fisheries Education (CIFE),**
Varsova, Mumbai
- **Aquaculture Research and Training Centre,**
kakinada, A.P.
- **Freshwater Fish Farm of Aquaculture Research and**
Training Centre, balabhdrapuram, A.P.
- **Central Marine Fisheries Research Institute,** Cochin.
- **Central Institute of Freshwater Aquaculture,** Orrisa.
- **Central Institute of Brackish water Aquaculture,**
Chennai.

Dr. V.G. Jhingaran, was Director of CIFRI, Barrackpore and one of the eminent fishery biologist.

Culture of Exotic fishes in India and other continents

- *Cyprinus carpio*: most extensively cultivated fish
- *Hypophthalmichthys molitrix* originating from China and Samur Basin, Russia has been introduced in – **Taiwan, Thailand, Malysia, Japan, Sri Lanka, India, pakistan, Nepal, Philipines, Myanmar, Hong Kong, Singapore,Israel.**
- In India first ever fingerlings of silver carp was brought from Japan in 1959.
- Grass carp was brought to CIFRI in 1972.

Coastal Aquaculture

- The oldest form of 'Coastal Aquaculture' is Oyster Farming by the early Romans, Greeks, Japanese.
- The animals which are now being cultured are shrimps, lobsters, oysters and clams.

Farming of fish weeds

- Recent origin.
- The earliest reference about sea weed culture appears to have published in Japan (1952).
- Edible sea weeds expand considerably in Korea, Taiwan and China.
- In Philippines and Hawaii, Several sp. of **algae** are regularly eaten.
- Several sp. of sea weeds contain **Gelatin**, used for the preparation of Jams & Jellies.

- Dried sea weeds (**China Grass**) are used in domestic cookery for making sauces, soups and puddings

