

Unit 2: History of Aquaculture

❖ Chapter 1. History of Aquaculture

It is only within recent period when means of communication and transportation and exchanges beyond continental and national boundaries were possible that aquaculture development has become unified, intensified and in some cases, integrated. There are at least 4 theories that may explain the beginnings of aquaculture. These are described as follows

1. Oxbow theory

In inland areas rivers, in the course of time, develop curves and oxbows which, due to natural topography and physiography of the area, may further result into long, winding oxbows of varying sizes. As time went on, under varying flood levels that occurred in different years such rivers may have changed their courses, leaving behind the formed oxbows together with the fish and other living organisms in them. Human population along the rivers, who by adaptation are natural fishermen, discovered a good harvest of fish could be derived from these naturally formed oxbows. It was also found that seasonal flooding of these water areas restocked them with fish which again could be harvestable during the ensuing dry season. Taking full advantage of this occurrence, enterprising individuals in the surrounding communities would begin to improve the embankments, enclosing such oxbow areas. Subsequently, in addition to these seasonal natural stock of fish that enter the modified oxbows, additional stock may be planted, thus starting aquaculture management in them. This continued until complete aquaculture management was attained.

2. Catch-and-hold theory

Fish and other aquatic products have always been held in high esteem by the early rulers of big empires. At the same time, it was a practice to build water areas as source of water, recreation, or a means of defense around castles. Such water areas were not really intended for rearing fish but some of the rulers demanded fish, regardless of the season so that the responsible officers around these rulers had to provide means to obtain fish even during winter. Due to this necessity, the practice has developed to stock fish caught from natural waters into the water areas as constructed around castles or communities. As it turned out, some of the fish stocked in these artificial waters were able to survive and grow. In the course of time, the species that

survived and grow such as the common carp were selected for this catch-and-hold system of providing fish. As a further development, stocking of the right amount and kind of fish and feeding them when necessary also developed resulting in actual aquaculture practice. The monasteries of Europe and the palaces of emperors and other rulers exemplified this type of venue for aquaculture development.

3. Concentration theory

Many tropical areas of the world are affected by monsoons, one bringing strong rains with some floods and the other the dry season. During the rainy system, the rivers which provided the waterways get swollen and if the watershed was extensive, wide-level lowland places were likewise flooded. Extensive marshlands rich in vegetation and aquatic organisms, including fish, provided wide and favorable habitat for growth and reproduction during the flood season of the year. When the rainy season decreases until it finally stops, the water in these floodlands also gradually receded. As the dry season progressed, the water further receded, draining almost all the flood plains but leaving only spots of deep areas and the rivers with water. These resulted in the concentration of the fish that have grown and reproduced during the wet season into the watered depressions or back into the rivers. Fishermen from the surrounding communities catch fish from these concentrated depressions. At the beginning, most of the fish were caught without regard to size or kind. Later on, the small ones were left behind or gathered and transferred to other rearing areas. If suitable, some of these depressions would be provided with embankments in which culture of suitable fish stock in them was conducted, thus starting aquaculture management which began through the concentration version.

4. Trap-and-crop theory

While the first three theories have been observed as developments from inland freshwater areas, this fourth development is characteristic of brackish and marine areas affected by tidal fluctuations. Coastal areas usually abound with coves, lagoons, permanent ponds, enclosed swamps or even depressions which were periodically watered and fully or partially drained during ordinary or extreme low tides. The coastal communities in these types of water areas have long realized that these areas were regularly stocked with fin-fish, crustaceans, molluscs and other aquatic economic resources naturally found in these waters. With this knowledge, they started to install traps that would block the exit of these fish and crustaceans that may have entered the water area during a flood tide. A fisherman realized that by this management, he could be regularly be provided with fish for his table and some extra for the market. As time

developed, however, and as more fishermen fish in the surrounding waters, the amount trapped in these water areas declined. Therefore, instead of harvesting at each periodic tide fluctuations, the barricade to the watered area was kept in place for sometime, say, one to three months before the fish that have entered have grown to good size. This chronology of development was what actually happened in the development of brackish water aquaculture which probably began in Indonesia and spread to the Philippines, and later into Thailand, Malaysia, India and other areas in the world.

Chapter 2. Aquaculture development history

❖ History of Aquaculture in India

Occurrence of fish in India dates back to three millennium BC. Fish remains and cut marks have been obtained from excavations at Mohenjodero and Harappa of Indus Valley Civilization (2500 BC – 1500 BC) indicates utilization of fish as food. In India Kautilya, in his “Artha Shastra” written around 300 B.C. described how fish could be poisonous in tanks during war. King Someswara son of king Vikramaditya VI was the first to record the common sport fishes of India and group them into marine and freshwater forms in his book Manasoltara compiled in 1127 AD. During British rule in India, they developed sport fisheries through the introduction of trouts in the hill streams of Nilgris, Kashmir and Kulu valley.

With the formation of fisheries departments, the culture of food fishes and sport fishes received encouragements. The first scientifically designed fish farm was constructed by the then Madras fisheries department at Sunkesula in Krishna district (now Andhra Pradesh) during 1911. Fisheries Departments were established for development of aquaculture in West Bengal, Punjab, Uttar Pradesh, Andhra Pradesh, and Karnataka during 1908-1947.

In earlier days fry were collected from wild waters for culture. The urgent need for seeds to fill the expanding aquaculture industry resulted in technology breakthroughs in induced spawning of cultivable species during the period from 1700 to 1900. Indian scientists achieved the first success in induced breeding of Indian major carp through hypophysation in 1957 and Chinese succeeded in Chinese carp in 1958. Likewise the penaeid shrimp species and the giant freshwater prawns used in culture were also hatched under control in hatcheries.

The development of freshwater aquaculture in the country became established following the establishment of the Pond Culture Division at Cuttack in 1949 under the name of the Center of Central Inland Fisheries Research Institute (CIFRI), West Bengal. Whereas Brackishwater farming in India is an age-old system confined mainly to the bheries (manmade impoundments

in coastal wetlands) of West Bengal and pokkali (salt resistant deepwater paddy) fields along the Kerala coast, without additional input, except that of trapping the naturally bred juvenile fish and shrimp seed. The importance of brackishwater aquaculture was recognised only after the initiation of an All India Coordinated Research Project, (AICRP) on 'Brackishwater Fish Farming' by ICAR in 1973. The project developed several technologies pertaining to fish and shrimp farming, however, scientific and commercial culture at present is restricted to farming of shrimps. The earliest attempt on mariculture in India was made at the Mandapam centre of CMFRI in 1958–1959 with the culture of milkfish (*Chanos chanos*). CMFRI has developed various technologies for a number of species including oysters, mussels and clams among sedentary species, as well as for shrimp and finfish. CMFRI initiated a pearl culture program in 1972 and successfully developed the technology for pearl production in Indian pearl oysters.