

UNIT:5

(AQUACULTURE)

Nature

&

Scope

AQUACULTURE

11.1. INTRODUCTION

The World watch Institute report from Washington predicts massive grain deficit over the next 40 years on the Indian sub-continent, in China, and in Africa, if the population continues to grow. The President of the Institute, Lester Brown, in the new book, Full House: Reassessing the Earth's Population carrying capacity", published in 1994, reports that fish catches are leveling off, irrigation water in major food producing regions is becoming increasingly scarce, industrialization in Asia is taking a heavy toll of crop land and additional fertilizer use is no longer raising crop output. In such a situation the 'Journey towards Blue Revolution' holds a tremendous promise to shoulder the additional load of protein requirement of ever increasing human population.

Fish as a fairly valuable item of human nutrition is gaining greater recognition. The demand for fish, as nutritious food for human consumption, is increasing with each passing year, because its proteinaceous matter is assimilated two to three times faster than cattle meat (Martyshev, 1983). Besides, fish oil, a known source of vitamins, also contains essential poly-unsaturated fatty acids (PUFAs) which when taken, are reported to minimize the risk of malignant tumours, heart and pulmonary ailments. Moreover, the fishery sector also holds a good scope for poverty alleviation through employment to millions of rural farmers particularly women, enhancing income and by earning valuable foreign exchange.

'Give me a fish to eat to make my day, teach me to fish to make my life' - thus goes the Chinese proverb. But simply depending on capture fishery will not take us all the way through unless we grow

fish because every resource is limited. The maximum wild capture fishery potential from world's oceans has probably already reached. This calls for a shift in focus from 'capture to culture fishery' in order to ensure sustained yield for meeting the increasing demand of fish consumption.

11.2. DEFINITION

According to FAO, "aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the earning process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated".

11.3. STATUS

Aquaculture continues to be the fastest food growing animal food producing sector and currently accounts for nearly half (49%) of world's food fish consumption. Globally, annual increase in aquaculture produce has been around 6.1% during the last decade. According to the FAO report (2014) the total global production through aquaculture (fishery part) has gone up from 32.4 million tonnes in 2000 to 70.5 million tonnes in 2013 while aquatic algae production has reached to 26.1 million tonnes. The contribution through capture fishery has been 91.3 million tonnes in 2012, a decrease by 2.6% over previous year. Given the projected population growth, an additional 40 million tons of aquatic food will be needed by 2030 to maintain current per capita consumption of about 8 kg.

According to FAO report of 2014, after China (41.1 million tonnes), India is the second largest aquaculture producing country (4.2 million tonnes), followed by Vietnam and Indonesia (3.1 million tonnes each). Indian aquaculture has registered a phenomenal growth over last two decades with fresh water aquaculture contributing about 90% of the total aquaculture production. The total fish production in India has reached to 8.6 million tonnes (4.4 million tonnes from capture fishery and 4.2 million tonnes through aquaculture) and per capita consumption of fish in India is now 8 kg per year. Besides contributing 1.7 – 2% to national GDP, the aquaculture sector is providing employment to approximately 14.45 million people in India.

Indian aquaculture primarily is focused towards carp culture in freshwaters and shrimp culture in brackish water.

Freshwater aquaculture activity is prominent in the eastern part of the country; particularly the states of West Bengal, Orissa, Andhra Pradesh, Punjab, Haryana, Assam and Tripura and as regards the market, the main areas of consumption for freshwater fish are in West Bengal, Bihar, Orissa and north-eastern India.

The 3 Indian major carps namely, catla (*Catla catla*), mrigal (*Cirrhinus mrigala*) and rohu (*Labeo rohita*) contribute the bulk of aquaculture production forming about 80% of the total fish produced in India. The second major group is the exotic carps like common carp (*Cyprinus carpio*), grass carp (*Ctenopharyngodon idella*) and silver carp (*Hypophthalmichthys molitrix*). The country also possesses several other cultivable medium and minor carp species which show high regional demand, including, *Labeo calbasu*, *L. fimbriatus*, *L. gonius*, *L. bata*, *L. ariza*, *Puntius sarana*, *Hypselobarbus pulchellus*, *H. kolus* and *Amblypharyngodon mola* etc., but commercial farming of these species has been almost non-existent.

Due to the high economic value of the giant river prawn, *Macrobrachium rosenbergi*, the production has increased through its monoculture followed by monsoon river prawn, *M. malcolmsoni*. Large proportion of fresh water prawn cultured in

India is exported, earning foreign exchange. The state of Andhra Pradesh dominates the fresh water prawn farming, contributing about 80% of the total production with its 60% of total water area dedicated to prawn farming.

Brackish water aquaculture is mainly concentrated on the coasts of Andhra Pradesh, Tamil Nadu, Orissa and West Bengal and farming has been limited to single species of *Paeneus monodon*, the scientific production of which started only during 1990s. The area brought under shrimp farming has reached now to about 152000 hectares and the production has gone up to 115000 tonnes, most of which is exported, earning foreign exchange to the country. The state of Andhra Pradesh produces 50% of the total brackish water shrimp in India providing 47% of the total shrimp farming area for this purpose.

Culture of marine animals in India is still a low key venture, involving only a few shellfish species such as green mussel (*Perna viridis*) and brown mussel (*P. indica*) using raft or logline culture methods; Indian backwater oyster (*Crassostrea madrasensis*) using rack and tray method and the farming of Japanese pearl oyster (*Pinctada fucata*) by raft culture.

11.4. RESOURCES

India is blessed with huge resources for aquaculture practices. These include 2.36 million hectares of ponds and tanks, 1.07 million hectares of beels, jheels and derelict water bodies in addition to 0.164 million kilometers of rivers and canals, 3.15 million hectares of reservoirs and 0.72 million hectares of upland lakes that all could be put to use for aquaculture purposes.

For brackish water aquaculture, about 1.2 million hectares of area are available that could be used for shrimp farming. Besides, there are 8.5 million hectares of salt affected areas available of which 2.6 million hectares could be exclusively utilized for aquaculture due to unsuitability of these resources for other agricultural practices.

11.5. SCOPE

Aquaculture holds a tremendous scope for exploitation of water resources in India for meeting the animal food requirements of increasing human

population. The scope for increasing the production through aquaculture is both horizontal (expanding the area under aquaculture) and vertical (increasing the productivity per unit area). Presently India utilizes only about 40% of the available 2.36 million hectares of ponds and tanks for fresh water aquaculture which means that just 0.9 million hectares of these water bodies are under scientific fish culture. Similarly it is just about 13% of the 2.6 million hectares of brackish water area available in the country that is under shrimp farming.

Given the huge human population in India with 250 million economically strong potential consumers of animal food, the domestic demand for fish and processed fish food is increasing. The demand for fish in the country is about 10 million tonnes against the current supply of 8.6 million tonnes. The fish yield needs to be increased for increasing per capita consumption from 8 kg to 11 kg per year as recommended by World Health Organization.

The cultured shrimp constitute half of the total shrimps exported to other countries like Japan, Europe, and USA etc and still has tremendous untapped potential in this sector for earning foreign exchange.

The mariculture has taken its roots in India recently with the culture of marine mussels and oysters. This sector has about 8000 kms of coastline available and hence holds immense potential for aquaculture.

Increased R&D support with strong linkages between research and development, investment in fish & prawn hatcheries, establishment of aquaculture estates, feed mills and other supporting industries are some of the areas that, if ensured, will help in realizing the full potential of aquaculture resources in India.