Chapter - 1

INTRODUCTION
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Fishes form one of the most important group of vertebrates for man influencing his life in various ways, millions of human beings suffer due to hunger and malnutrition. Fishes form a rich sources of nutritions and provide a means to tide over the nutritional difficulties of man.

The fish flesh is an excellent source of proteins. The percentage of the protein present in the fish flesh varies from 15% to 20% of their weight, liver oil contains 55-75% fat, 5-10% protein and rest of water, fish meal is composed of protein 60-80%, ash 1-5% and oil 5-6%. Fish is a source of cheap animal protein and current per capita consumption of fish in India is around 9 kg per annum as compared to 11 kg recommended by World Health Organization (W.H.O.)

The development of fishery has witnessed great strides all over the world during the last four decades. The world fish production has gone to over 107 million tonns in 1995 as compared to 86 million tonns in 1985 showing in 25 percent increase during the period. The fish production in India has increased from 0.70 million tonns in 1950-51 to over 6.00 million tonns in 2001-02. The Inland fish production has risen from 0.218 million tonns to 3.10 million tonns during the period. The share of Inland sector, which was 29 percent in 1950-51, has gone up to 51.67 percent in 2001-02. The increase in inland production was mainly accounted to rapid aquaculture development. This indicates the slow growth rate of production from capture fisheries. This difference in production of culture and capture fisheries is probably because of slow technological growth. This is happening
despite the huge inland water resources comprising 2.25 million hec of tanks, 2.09 million hec of lakes and reservoirs and also 0.12 million kilometer of irrigation canals and 2.3 million hec of paddy field capable of contributing highly to inland fish production. The gross domestic product at current prices has increased from Rs. 75778 crores in 1981 to Rs. 588189 crores in 1995. The amounts contributed to GDP by agriculture and fisheries sector were Rs. 46649 crores and Rs. 921 crores in 1980-81 and Rs. 265914 crores and Rs. 10963 crores in 1994-95. Presently the contribution of fisheries sector to the gross domestic product (GDP) and agriculture GDP has been estimated to be 1.2 and 4.2 percent, respectively. During the tenth five year plan (2002-2007), growth rate of 2.5 percent and 8 percent has been proposed for marine and inland fisheries, respectively. By the end of the tenth plan, this will enable a total fish production of about 8.2 million tonns with 3.3 million tonns coming from marine sector and the rest from inland sector.

Fisheries play an important role in the economy of India. It helps in augmenting food supply, generating employment, raising nutritional level and earning foreign exchange. Fisheries division of the department of agriculture has been undertaking directly or through state government various production oriented programmes, input supply programmes and infrastructure development programmes, besides formulating/initiating appropriate policies to increase production and productivity in fisheries sector. The potential for increasing fish production through aquaculture is considerable and much of the technology is relatively simple, inexpensive and consumes a minimal amount of energy. The technology for marine capture
**COMPOSITE FISH CULTURE TECHNIQUE**

**Indigenous Species**
- Catla (500)
- Rohu (1500)
- Nain (750)

**Exotic Species**
- Silver Carp (1000)
- Grass Carp (500)
- Common Carp (750)

**Fingerlings Stocking Rate**: 5000 - 6000 / ha. / Year
(2.5 - 3.0 Inch. Size)

**Fish Production**: 50 - 60 qt./ha. / Year
fisheries is becoming increasingly sophisticated and energy and capital investment for establishing and maintaining a deep water fishing fleet with all its attendant infrastructure is simply overwhelming.

In composite fish culture three major carps such as Cutla, Rohu and mrigal are used along with the silver carps, grass carps and common carp. The Indian major carps are the native ones found in most of our north Indian river whereas the silver carp gross carp and common carp are exotic brought from China. By using these six species combinations the national food available in the different strata of the water column in the fish ponds is properly utilized. The fish cutla is a zoo plankton feeder of the surface and Rohu of the mid column, mrigal feeds mainly from the bottom. By bringing in other three exotic fishes, the utilization has become more effective. The silver carp feeds mainly on phytoplankton.

**Present Status:**

Structure of fish production has undergone drastic changes. During the seventies and eighties, the share of inland fisheries was just above one third of the total and gradually increased to reach 40 percent in 1990-91 and about 50 percent in 2000-2001. The changes were due to declaration in growth of marine fish production and a policy shift in favour of inland fisheries especially aquaculture. Growth rate of fish production during nineties has been around 4.1 percent annum. The marine and inland sectors during the same period had growth rate of around 2.2 percent and 6.6 percent per annum, respectively.

**Inland capture fisheries-**

The rivers of India are being subjected to considerable stress and accordingly the adverse effects are being manifested in poor fish
landing both in terms of quality and quantity. The present day riverine fishery is below subsistence level with average yield of 0.3 t./km. The important riverine fishery of Indian major carps has either collapsed or is at the threshold of collapse, as the average yield had declined from 26.62 to 2.55 kg/ha/yr during last four decades in river Ganga. Biologically and economically desirable fish species have started giving way to low value species.

Environmental aberrations like reduction in water volume, increased sedimentation and water abstraction, irrational fishing practices are key factors responsible for the decline in fish production. Indian floodplain lakes are important because of their magnitude production potential and serving as breeding and nursing ground for riverine fish stock. The riverine and floodplain fisheries are very vital for conserving the original fish germ plasm essential for sustained development of aquaculture.

Reservoirs constitute the single largest inland fishery resources in the country. Average production from small, medium and large reservoirs is estimated to be about 50 kg/ha/yr. Studies indicate that lower productivity of reservoirs is due to lack of proper management of these water bodies.

Aquaculture has mainly contributed to the high growth of inland fisheries (6.6 per cent annum) as compared to marine fisheries (2.2 percent annum) during the nineties of the total inland fish production, about 80 per cent comes from aquaculture, setting up of fish farmers development agencies (FFDAs) in mid seventies gave the major boost for freshwater aquaculture. As a result, productivity has gone up from about 600 kg/ha/yr. to about 2,200 kg/ha/yr. in ponds under FFDAs
across the country. Now only 30 percent of the potential area is under freshwater aquaculture. Indian major carps labeo rohita (Rohu), catla catla (catla) and cirrhinus mrigala (mrigala) contribute about 78 percent to the total aquaculture production. Of late, scampi (fresh water prawn) farming has made much inbreeds into areas hitherto predominantly dominated by tiger shrimp, penaeus monodon, because of its inherent strength mainly in terms of faster growth and tolerance to varying environment conditions. Of the total 1.24 million ha identified as potential area for brackishwater aquaculture only about 10 percent area is being farmed. Of this about 80 percent is under traditional farming and the remaining is under extensive and semi-extensive shrimp farming. In the brackishwater aquaculture sector, emphasis has been mainly on a single commodity shrimp (especially penaeus monodon) by virtue of the excellent export value.

In order to product Indian fisheries from surges in imports and to enhance their competitiveness in the global market, it is necessary to reduce production costs, raise the productivity and quality of fish, produce to international standards besides reducing post harvest losses. It is necessary to increase our export and to ensure affordable food to our households. There is scope for expansion of area under freshwater and brackishwater aquaculture as presently only 30 percent and 10 percent of potential area is respectively under culture, besides increase in productivity. As suitable technologies are available, what is required is timely availability of inputs especially seed and feed, beside improved extension services and raising the educational level of fishers. Global aquatic animal trade and rapid transport, pathogen transfer due to international trade in live aquatic animals and their products is a major
underlying factor in aquaculture. This pathogen transfer and the consequent socio-economic, environmental and international trade implications are the most critical issues. The most striking example of spread of disease and consequential major economic loss in aquaculture is white spot disease in farmed shrimp. In India, subsidies proposed by the central government for fisheries during tenth five year plan include assistance to fisheries institutes, developing of inland fisheries and aquaculture and information networking, welfare programmes, strengthening of database and information networking, policy issues and human resources development.

The ASCM frame work distinguishes actionable subsidies from non-actionable subsidies. The later includes assistance for research and development, assistance to disadvantaged regions and adoption of existing facilities to new environmental requirement.

**Marketing of fish**-

Marketing of fish is as important as production of fish because only through appropriate marketing, fish producers can get the adequate price of their products. In our country fish trading is done in both way (i) organized way (ii) unorganized way. Co-operative societies, mandis and urban traders market their products in organized way whereas in local mandies, kasba, hot and villages, retailers market their products in unorganized way. The inland catch in some areas is sold to the Mandi (fishermen co-operative society). The mandi has yearly contract with the wholesale sellers. Wholesale sellers collect the fish from mandi and dispatch it to the big market mainly in north India and West Bengal by trains of refrigerated vans. In certain cases, it was observed that most of the small fishermen sell their catch in the local
market or in the nearby village markets. Export and Import of fish at large scale is also made, through which the foreign exchange and opportunity for employment are increased. Inspite of all these advantages there are some shortcomings in the field of fish marketing. We don't have solid and sufficient technology and relevant expertise in this field. In the comparison of other country such as China, Japan, Britain, U.S.A., our country has weaker fishery sector, government has paid less attention to this area. These are the reason for poor development of fishery sector of India.

Statement of the problem-

India is the sixth largest producer of fish and second largest producer of inland fish in the world. Fisheries sector is recognized as a powerful generator of income and employment. It is also a source of cheap and nutritious food besides a major foreign exchange earner.

Fish production has increased more than five fold since independence. It rose from only 800,000 tonns in FY 1950 to 4.1 million tonns in the early 1990s. Special efforts have been made to promote extensive and intensive inland fish farming, modernize coastal fisheries and encourage deep-sea fishing through joint ventures. These efforts led to a more than fourfold increase in coastal fish production from 520,000 tonns in FY 1950 to 2.4 million tonns in FY 1990. The increase in inland fish production was even more dramatic, increasing almost eight fold from 218000 tonns in FY 1950 to 1.7 million tonns in FY 1990. The value of fish and processed fish exports increased from less than 1 per cent of the total value of exports in FY 1960 to 3.6 percent in FY 1993.
Fisheries research and training institutions are supported by central and state government that deserve much of the credit for the expansion and improvements in the Indian fishing industry. The principal fisheries research institutions, all of which operate under the Indian council of Agricultural research are the central institute of marine fisheries research at Kochi (formerly Cochin), Kerala; the central inland fisheries institute at barrackpore, West Bengal, and the central institute of fisheries technology at Willingdon Island near Kochi. Most fishery training is provided by the central Institute for fishery education in Mumbai, which has ancillary institutions in Barrackpore, Agra (Uttar Pradesh) and Hyderabad. The central fisheries corporation in Calcutta is instrumental in bringing about improvements in fishing methods, ice production, processing, storing marketing, and constructing and repairing fishing vessels. Operating under a 1972 law, the marine products Exports Authority, head Quartered in Kochi has made several market surveys abroad and has been instrumental in introducing and enforcing hygiene standards that has gained for Indian fishery exports product a reputation for cleanliness and quality.

However, In the present scenario of Indian economy the per capita availability of fish is not up to the mark. The country is required to increase the per capita availability of fish to minimize the protein deficiency in the non-vegetarian population of the country. U.P. is known for its inland fishing. It has got rich water resources for fish production. In the end of eighth five years plan (1996-97) the fish production from all the resources in state was 1.50 lac tonns which has reached to 2.08 lakh in the year of 2000-2001. The above said
production is proposed to be increased up to 3.80 lakh tonns by the end of 10th five year plan. Uttar Pradesh is placed on 6th rank for its inter inland fish production.

However, as far as marketing of fish is concerned, there is lack of well planned marketing strategy. State has not yet developed well organized marketing system for proper selling of the fish. Maximum production is exported to the other states of India such as West Bengal, Asam etc. The poor people who are really engaged in this occupation are not getting return and profit. They are being exploited by middle man/broker, on the other hand consumers are not getting good quality of fish on reasonable prices.

The disguised unemployment of labour is one of the important factors for low income of the rural people. For reducing the pressure of rural population on land, it is essential to increase income and employment by other sources. The income of the farmers can be increased by developing subsidiary enterprises like inland fisheries poultry, dairy and piggary etc. Indian government has given more importance to the development of inland fisheries in the country to produce more nutritive food and to generate more employment in rural areas.

U.P. Government has been running many schemes for increasing fish production, so that poor people of the state may be benefited, Varanasi district is situated in the east of Uttar Pradesh, Varanasi district has got water areas for fishery such as, rivers, ponds etc. Fish farmer development agency is managing production and development of fishery. FFDA is emphasizing the scientific method of fish production from ponds and lakes situated in villages of varanasi
Following schemes are being run by government in Varanasi district.

1. Matasya Palak Vikas Abhikaran.
2. Fisherman Housing scheme.
3. Fisherman Life Insurance Scheme.

The fish farming is more profitable for large, medium and small farmers in Varanasi district of Uttar Pradesh. The present investigation will emphasize the socio-economic condition of large, medium and small farmers, cost of production and marketing, produces share’s in consumer’s price and marketing channels in Varanasi district. The present study will highlight the current situation of fish farming in Varanasi district and suggest measures how the farmers would adopt to move ahead on the process of marketing and production of fish in district and how the market would benefit the farmers too. Keeping in view the significance of inland fishing in Varanasi district, the following objective have been formulated:

1. To study the socio-economic profile of fish producers.
2. To examine the cost of production per kg. of inland fish in different size group.
3. To study the important marketing channels involved in marketing of fish.
4. To find out marketing cost per quintal of inland fish.
5. To find out producers share in consumer’s rupee in marketing of fish under different channels.
6. To study the problems faced by fish producers during fish farming and marketing of fish.