Chapter: I

INTRODUCTION

Fish is described as the meat of the third world (Jolly and Clonts 1). It provides important contributions to employment generation, income generation and foreign exchange earnings in developing and developed countries. Fish is considered as “rich food for poor people” and it is the major source of animal protein for over a billion people in developing countries (Gupta 7). Consumption of fish has great importance on human nutrition. It is an excellent source of readily digestible high quality animal protein with all essential amino acids necessary for human body that has a nutrient profile superior to all terrestrial meat. Kudi, Bako and Atala (17) reported that fish is a good source of thiamine as well as a rich source of Omega-3 polyunsaturated fatty acids, fat soluble vitamins (A, D and E), water soluble vitamins (B complex), and minerals (Calcium, Phosphorus, Iron, Iodine and Selenium). Consumption of fish reduces the blood cholesterol level and high blood pressure which ultimately reduces the arteriosclerosis conditions in adult populations. Low rates of cardiovascular diseases is reported in populations with high intakes of fish which is due to health preserving effects of the long chain n-3 (ω-3) polyunsaturated fatty acids (eicosapentaenoic acid and docosahexaenoic acid) present in fish. Mortality from coronary heart disease is low among Greenland Inuit who eat large amounts of fish and whale meat and among Japanese fish eaters (Prichard et al. 819). Rao and Raju (4-5) also reported that consumption of fish reduces the cholesterol level due to presence of omega-3 fatty acid in fish and prevent heart attacks and hypertension. Premature birth and an abnormally low birth weight and hyperactivity in children have been linked to insufficient intake of omega-3 fatty acids. It is reported that children who regularly eat fresh fish with fat content have four times lower risk of developing asthma than children who rarely eat such fish. Studies show that countries with high levels of fish consumption have fewer cases of symptoms of depression. A high intake of fish reduces the age-related memory loss and a lower risk of developing Alzheimer’s disease (Gonna 2006, 45). The Report of the Joint Expert Consultation on the Risks and Benefits of Fish (FAO/WHO 2011, 50) emphasized the benefits of fish consumption on reducing the mortality from coronary heart disease for the general adult population and emphasizes the net neuro
developmental benefits to offspring of fish consumption by women at childbearing age, particularly pregnant women and nursing mothers. According to Akpaniteaku, Weimin and Xinhua (28), the contribution of small fish to food and nutrition security is especially important as they are consumed whole, including bones. Some small fish species contain large amount of vitamin. In small fish, vitamin A is present as retinol and anhydroretinol, which are readily absorbed by human body. Freshwater fish represents an essential, irreplaceable source of high quality, inexpensive animal protein crucial to balanced diets in marginally food secure communities.

Fisheries sector plays an important role through producing valuable protein-rich food. It is a source of income and livelihood for millions of people around the world. According to the report of ‘the State of World Fisheries and Aquaculture’ (FAO 2012, 3-10), fisheries and aquaculture have provided a source of income and livelihood for 54.8 million people in the primary sector in 2010. Of these, an estimated 7 million people were occasional fishers and fish farmers distributed over India, China, Myanmar, Bangladesh and Indonesia. Employment in the fisheries sector has grown faster than the world’s population and than employment in traditional agriculture. In 2010, more than 87% of all people employed in the fisheries sector were in Asia, followed by Africa (more than 7%), and Latin America and the Caribbean (3.6 %). China is the country with the highest number of fisherman and fish farmers, representing nearly one-third of the world’s total. Global fish production scenario reveals that out of total fish production of 154 million tonnes, capture fisheries contributed 90.4 million tonnes (11.5 million tonnes from Inland and 78.9 million tonnes from Marine) and aquaculture contributed 63.6 million tonnes (44.3 million tonnes from Inland and 19.3 million tonnes from Marine) during 2010-11. Aquaculture represents the fastest-growing animal based food producing sector showing an impressive annual growth of 6-7% (Ayyappan 2012).

Fisheries sector of India has become a sunrise sector of Indian economy due to its increasing food supply, employment generation, income augmentation, nutrition security and foreign exchange earnings. This sector has witnessed an impressive growth from a subsistence traditional activity to a well developed commercial and diversified enterprise. During the previous five year plans contribution of fisheries sector is estimated around 1.10% to the GDP and 5.3% to the agricultural GDP (Ayyappan et al., 2011, 2). Fisheries
sector of India has been recognized as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries as well as earning foreign exchange (Ayyappan and Krishnan, 2004, 392). As per the report of the Department of Animal Husbandry, Dairy and Fisheries (DAHDF 51), fisheries sector provides livelihood to approximately 14.49 million people in the country.

Blue revolution in the country started in 1971 with the launching of a nation-wide demonstration on composite culture of Indian and exotic carps under the All India Coordinated Research Project (AICRP). This project was carried out by the Central Institute of Fisheries and Research Institute (CIFRI) with enormous success throughout the country. A series of standardization and development of methods in different aspects of aquaculture, i.e., resource survey, their characterization and effective utilization, production and rearing of seed, and grow out farming technology have been implemented resulting in holistic development of aquaculture over the years (Jayasankar and Das 54).

India ranked as the second largest country in aquaculture production in the world during the year 2010-11 and fish production has increased from 4.16 million tonnes in 1991-92 to 8.29 million tonnes in 2010-11 (DAHDF 11). This production was recorded from both marine and inland fisheries resources. Marine fisheries mainly comprised of a long coastline of 8118 km with an Exclusive Economic Zone (EEZ) extending to 2.02 million square km and continental-shelf area of 0.53 million square km. Inland fisheries comprised of 2.91 million ha reservoirs, 2.41 million ha pond and tanks, 0.81 floodplain lake and derelict water bodies, 1.24 million ha Brakish water bodies, and 0.2 million km rivers and canals (DAHDF 89-90). About 35% of Indian population is fish eaters and the per capita consumption is 9.8 kg (2010-11), whereas the recommended intake is 13 kg (Manual on Fishery Statistics 1). According to the NSS 66th Round report (A1-A147), annual per capita consumption of fish was found 25.44 kg in Kerala, 9.72 kg in West Bengal, 14.16 kg in Tripura, and 8.04 kg in Assam.

The Northeastern States of India, comprised of landlocked states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura, is one of the richest region of India in terms of biodiversity and natural resources. The total water spread area of the Northeast is about 0.41 million hectare in the form of riverine fisheries, flood plain wetlands, reservoirs, forest fisheries, swamps and derelict water
bodies, ponds and tanks etc. Fish have long been an important food item for the inhabitants of the region. Fish has been associated with the social life of the people of Northeast India from time immemorial. Not only it provides nutritious food, but also forms an unbreakable relationship with the culture, religion, and traditions of the region. With more than 95% of population being fish eaters, there is a huge gap between supply and demand (Munilkumar and Nandeesha 399). Among the Northeastern states, fish production is highest in Assam (0.227 million tonnes) contributing around 2.73% to the total fish production of the country followed by Tripura (0.049 million tonnes), Manipur (0.02 million tonnes), Nagaland (0.007 million tonnes), Meghalaya (0.004 million tonnes), Arunachal Pradesh (0.004 million tonnes), and Mizoram (0.003 million tonnes). The total fish production in the region during 2010-11 has been reported to be 0.31 million tonnes (DAHDF 88).

Assam is blessed with inland water bodies covering about 0.39 million ha in the form of flood plain wetlands, locally known as ‘beels’ (0.100 million ha), rivers (0.205 million ha), ponds and tanks (0.035 million ha), swamp and derelict water bodies (0.039 million ha), forest fisheries (0.005 million ha), reservoir fisheries (0.002 million ha), and community pond (0.004 million ha) which have a greater potentiality for fish production (Economic Survey, Assam, 2011-12, 99). These resources yielded 0.23 million tonnes of fish during 2010-11 against an annual demand of 0.31 million tonnes (based on minimum nutritional requirement of 11 kg/person and considering 90% of the state’s population is fish eaters). Though rice and fish are the two basic diets of the Assamese people where 95% of the state population consumes fish as an important protein rich food (Das and Goswami 33), the per capita consumption of fish in the state is 8.3 kg which is below the national average 9.8 kg. Cognizant to the importance of fisheries sector in rural economy, a number of programmes have been implemented in different time but the growth rate in the fisheries sector of Assam is almost at the same level with an annual increase of about 2.65% since last 10 years (Bhuyan and Dutta 164).

For development of Inland fisheries and aquaculture in India, several government programmes have been formulated and implemented. A centrally sponsored scheme is being implemented through the State Governments/Union Territories under macro-management approach. This scheme covers all inland fishery resources available in the
country in the form of freshwater, brackish water, coldwater, waterlogged areas, saline/alkaline soils for aquaculture and capture fishery resources (reservoir/rivers etc.). The scheme has seven components, viz., Development of Freshwater Aquaculture, Development of Brackish water Aquaculture, Development of Coldwater Fisheries and Aquaculture in the Hilly Regions, Development of Water-logged Areas into Aquaculture Estate, Utilization of Inland Saline/Alkaline Soils for Aquaculture and Inland Capture Fisheries (Reservoirs/Rivers etc.) and Innovative projects for implementation in the 11th Five Year Plan. A network of 429 Fish Farmers Development Agencies (FFDAs) has been established in the country with the main objectives of popularizing fish farming, creating employment opportunities and diversifying aquaculture practices, and providing assistance to fish farmers with a view to creating a cadre of trained and well organized fish farmers to be engaged in aquaculture. National Fisheries Development Board (NFDB), an autonomous organization under the administrative control of the Department of Animal Husbandry, Dairy and Fisheries, under the Ministry of Agriculture, Government of India was established on 9th September 2006 at Hyderabad which plays an important role in the development of fisheries sector in the country (DAHDF 51-64).

The success in fisheries development programmes depends on good marketing systems. Fish marketing plays a pivotal role not only in making available the produce to the consumers but also stimulating further production and consumption leading ultimately to the overall economic development of Fisheries sector (Rao 1-7). Fish production as well as marketing technology is essential for reinforcing the progress of fisheries development. But fish marketing in Assam is yet to be streamlined in a sound manner. Assam Apex Co-operative Fish Marketing and Processing Federation (FISHFED) was established in 1978 as an apex co-operative body to look after marketing and processing activities of fish in the State. Though fish marketing is one of the major activities of FISHFED, due to low procurement and fixation of price by the Board of Director, the primary member societies are reluctant to sell their harvest to FISHFED. Barik and Katiha (151-52) also revealed that the activities of FISHFED was more or less defunct and conducted limited activities like marketing of fish. The study expressed that informal institutions like non-government organizations (NGOs), informal groups, social institutions, village communities, and Self-Help Groups (SHGs) can play an important
role in fisheries activities. These institutions emerged with the need for a collective effort or a legacy of the past. They are efficient in terms of mutual reciprocity, information flow and accountability within the system. These organizations are very flexible and therefore, highly efficient in their operations.

In the present system of fish marketing in Assam, producers who produce fish at a commercial level carry their fish to the wholesale fish market of district headquarters or to a market where they expect more remunerative price either in the early morning or in the afternoon. Before taking it to the market, the fish farmer segregates the fish according to size and species. Fishes are usually packed in different containers like, aluminum containers, bamboo baskets, jute bags etc. On arrival of fish at the wholesale market it is usually sold by auctioning system which is also prevalent in other parts of the country.

The auctioneers present in the market take the responsibility of auctioning the fish to the highest bidder with a commission charged to the farmers. There are some commission agents in the market who engage middlemen to facilitate the marketing process who usually sit in a particular place of the market, locally known as ‘kata’. These middlemen perform the job of advertising and publicity for attracting fish farmers, grading the fish according to species, size and freshness, auctioning, keeping the record of weight of fish, and collecting money from buyers. After the auctioning process, fish farmers are paid for their fishes after deducting commission and other market charges. There are some village traders/producers who purchase the fish from different fish farmers and bring them to prospective wholesale fish market. Fishes are then sold in the same method of auctioning.

Fish harvested from ‘beel’ (floodplain wetlands) and riverine fisheries are also marketed in the same method of auctioning. Sometimes, instead of carrying fish to the market the ‘Mahaldar’ (Lessee) and fishermen auction their fish at beel/river site. The village traders then carry the fish for selling it to retail market (Nath, Kalita, and Bhuyan 28-30).

The key to successful fish marketing lies in understanding the needs of the consumers. Modern fish marketing tries to achieve consumer satisfaction as well as provide remunerative price to the producers. Understanding consumer motivation and knowing the relative importance of various attributes of fish and criteria of choosing fish products for different consumer groups are essential for development and promotion of local products. The development of attractive and convenient processed food from local
staples combined with active marketing can succeed in increasing demand of such domestically produced food (Delisle 1-77).

The fishery economy in the country over the years has significantly changed from one of subsistence level to a market oriented economy. In the absence of an efficient fish marketing system, the producer fails to convert the production activities to profitable opportunities. One of the major advantages of aquaculture is that the supply can be made market-oriented as opposed to the production oriented marketing. A proper understanding of consumer’s demand, attitudes and behaviour are major aspects in planning a viable aquaculture production programme. To achieve marketing success, consumer’s preference and acceptance have to be the criteria of fish species selection, value addition, place of purchasing, frequency and average quantity purchase at a time. Production programmes without consumer survey, have experienced considerable marketing problems by silver carp, milk fish, and mussels in certain countries (Pillay and Kutty 274). Proper understanding of important factors associated with fish consumption guides fish producers and marketers in their decision making process. Such information helps to improve market promotion, product perceptions and distribution. Shift in dietary pattern, higher economic growth, rising population, availability of fish, tastes and preferences are the driving forces for rapid growth in domestic fish demand and trade (P. Kumar and G. Kumar 2009, 22). Market oriented approach lays greater emphasis on consumer’s taste and preferences by providing desired services through incorporation of the variables like product, price, promotion, and place (distribution) in the most effective manner (Khobragade and Sonawane 54). Hence, the consumer demand for fish and fish products needs to be studied so as to identify, understand and finally foresee the future potential of fisheries sector.

Considering this background in mind, this study has been undertaken with the aim of investiging both the demand and supply forces for fish and fish products and brings in a convergence to develop marketing strategies. The study has been carried out in two different phases. The first phase consisted of finding out the consumer’s buying behavior and their willingness to pay for different value added fish and fish products. A consumer sample of 660 have drawn from different geographic and demographic profile using quota sampling technique and information about fish consumption patterns were
collected through personal interview with a pretested questionnaire. The collected data were analyzed by applying different statistical tools. The second stage consisted of the analysis of the constraints related to production and marketing of fish in the study area.

For identifying the constraints of fish production, sample survey of the fish farmers (240) was undertaken where they were asked to give their response in a 5 point Likert scale questionnaire. Factor analysis of the responses has been done to make the number of problem variables manageable. To bring in convergence mentioned above, marketing strategies, including new product development with respect to fish have been suggested in the study. To develop strategies related to new product development and promoting and delivering these products to the target market, the information collected from the consumers and stakeholders of fish marketing chain were analyzed to segment the market on the basis of preference of fish products, demography, economic situation, community, and willingness to pay. The total supply chain with respect to fish has been addressed from a holistic point of view. Needs of the consumers have been identified and supply of fish and fish products have been linked to this. Again on the basis of needs of the consumer’s new products and methods of delivering them to the consumers conveniently with different pricing strategies are proposed in the study.

Since no marketing strategies have been formulated so far based on consumption and preference patterns of fish in the study area (as revealed from literature review), the strategies developed and finalized in the present study would help the producers and marketers in their decision making process and also may help the researchers and policy makers to frame developmental fisheries projects and programmes for the State. This is expected to be a major contribution of the study the body of knowledge.

The entire study is presented in five chapters. The introduction of the study, stating statement of the problem, is placed in Chapter-I. Chapter-II deals with review of various studies made in the line of the objectives framed in the present study. The Methodology along with the statistical tools used in the study is described in the Chapter-III. The results and discussions are presented in Chapter-IV. Major findings, strategies formulated, proposed conclusions drawn and specific policy issues are presented in Chapter-V.