CHAPTER- V
STRATEGIES AND CONCLUSIONS

This study was undertaken with the major aim of understanding consumption behavior of the fish consumers and to develop production and marketing strategies to enhance fish demand. A sample of 660 fish consumers was surveyed to fulfill this aim. At the same time, fish producers/farmers and other stakeholders were surveyed to find out constraints and prospects of this sector in the market. Different sampling techniques and statistical tools were applied as and when required.

The major findings derived from analysis of data in the study are presented below, followed by strategies developed for popularizing fish/fish items to reduce/remove the constraints of the stakeholders in fish business.

a) Fish consumption patterns:

- Majority of the consumers (60.3%) in the study area have the highest preference for fish followed by chicken, and mutton. The per capita fish consumption in the study area is estimated at 14.27 kg/year which is higher than the national average (9.8 kg). There is significant difference of per capita consumption of fish between Assamese and Nepali, Assamese and North Indian, Assamese and Bengali, Bengali and Nepali, and Bengali and North Indian. The annual per capita consumption of fish is highest among the Assamese community (19.11 kg), followed by the Bengali (15.41kg), the Nepali (8.83 kg) and the North Indians (8.31 kg). The per capita consumption of fish increases with increase in household income.

- Majority of consumers (53.7%) consume fish twice a week. The average quantity of fish purchased at a time by all types of consumers is 500 gm. The average monthly expenditure on fish per family in the study area is Rs.662.42 which constituted 14.56% of monthly household expenditure on food. The monthly average expenditure on fish in rural area is Rs.580.15 and in urban area Rs.744.70. The percentage of monthly expenditure on fish with respect to total
monthly household expenditure on food items is more in urban area (14.69%) than in rural area (14.41%).

- Consumer preference for different varieties of fish varies. Among Indian Major Carps, rohu (*Labeo rohita*) is the highest preferred species followed by catla (*Catla catla*), and mrigal (*Cirrhinus mrigala*). Among exotic carps, common carp (*Cyprinus carpio*) is the highest preferred fish followed by grass carp (*Ctenopharyngodon idella*), and silver carp (*Hypophthalmichthys molitrix*). Bhangon (*Labeo bata*) is the highest preferred fish among minor carps followed by kurhi (*Labeo gonius*), and koliajara (*Labeo calbasu*). Among different types of live fish the most preferred variety is magur (*Clarias batrachus*) followed by singi (*Heteropneustes fossilis*), koi (*Anabas testudineus*), sol (*Channa striatus*), and goroi (*Channa punctatus*). Among three big varieties of fish chital (*Notopterous chitala*) is highly preferred by consumers followed by arii (*Aorichthys seenghala*) and borali (*Wallago attu*). The consumers also preferred small varieties of fish such as moa (*Amblyparyngodon mola*), puthi (*Puntius spp.*), and boriola (*Aspidoparia spp.*).

- Palatable taste, high nutrition value and food habit are the major factors that influence consumption of fish among consumers.

- Majority of consumers (69.8%) prefer curry followed by fried (26.7%), steamed (2.7%) and roasted (0.8%) form of cooking. Depending on species of fish, methods of preparation varies.

- Majority of respondents (93.9%) prefer local fish in live and fresh condition over ice preserved imported (*chalani*) fish. A vast majority of respondents (98.9%) in the study area have shown their willingness to purchase fish as dressed and chopped, and 46.5% as ready to eat fish other than fried fish. The percentage of respondents opting for ready to eat fish is more in urban area (55.2%) than in rural area (37.9%). Majority of respondents (87.9%) are willing to pay 5% extra for value addition as cleaning, dressing and chopping.

- Majority of respondents (59.7%) in the study area agreed to pay extra if quality and weight of fish is certified. A higher percentage of respondents (48.8%) agreed
to pay extra if convenient, clean and hygienic markets are developed and maintained.

- Majority of respondents (52%) in the study area purchase fish from local market. Respondents of the study area, largely agreed to the statement ‘dirty and unhygienic market area’, followed by ‘chances of getting cheated’, ‘unavailability of preferred fish’, ‘irregularity of supply’, and ‘quality difficult to ascertain’ as constraints of purchasing fish.

- About 36% of respondents in the study area took fish/fish items sometimes in eating joints and about 40% of respondents in the study area irrespective of geographic and demographic profile agreed choosing fish items if different delicacies are made available.

- Decision on the type of fish to buy and frequency of eating fish were mainly taken by the family head/husband. The decision about preparation and cooking of fish was taken mainly by the housewife.

b) **Constraints of production and possibilities of marketing of fish and value added fish**

- Four major constraints have been identified with respect to production of fish. These are ‘support system constraints’, ‘infrastructural constraints’, ‘financial and technical constraint’, and ‘societal constraints’. One of the major problems as perceived by the farmers is lack of standardized technology for indigenous fish species.

- Fluctuations of demand and supply of fish is one of the major constraints as perceived by all the wholesalers, retailers and vendors. Others constraints of marketing of fish are mostly related with market infrastructure such as lack of proper fish transportation facility, lack of insulated containers/carriers to carry fish to the door step of consumers, lack of cold storage, inadequate facilities for fish handling and storage, inadequate parking space for fish carrying vehicles, lack of adequate provision for ice, insufficient space to accommodate all
wholesalers and retailers, lack of proper drainage and waste disposal system, and lack of good provision for water supply.

- The demand for fish is more in those restaurants where rice is the core item to serve.
- The widely used species in eating joints is rohu and it is followed by catla, bhangon, small variety of fishes (borolia, singorah, moa, pathi etc.), arri, chital, illish, prawn, borali, kurhi, pabha, mrigal, and koi. In comparison to different fish items, the numbers of meat items were found more in eating joints.
- Overall, 60% of eating joints opined that there is a possibility of consumers choosing fish items if they are made available. On an average, 54.0% managers/owners of eating joints opined that there is probability of utilizing low-valued fish for preparation of value-added fish items.
- The main difficulties associated with preparing and selling of value-added fish items as perceived by managers/owners of eating joints are less demand for fast food fish item, non-availability of suitable varieties of fish, and lack of awareness about fast food fish items.

The present study tried to evolve some strategies based on findings of the study and reviewing existing strategies adopted for fisheries development in the State so that this sector can become self-sufficient and consumers accept fish as staple food to generate more demand. The proposed strategies were distributed among experts to find out their validity and practicability. Experts were selected based on their contribution/experience in fisheries development in the state. Interview with the experts were conducted in two rounds and the strategies finalized.

**Suggested Strategies**

The strategies suggested for improvement of production and marketing of fish to cater to the need of the consumers are given below.

**A. For More Fish Production**

After identifying perceived constraints of fish production and responses on the same by the producers factor analysis was carried out and four significant factors have been identified. These are ‘support system constraints’, ‘infrastructural
constraints’, ‘financial and technical constraint’, and ‘societal constraints.’ The strategies developed to remove these constraints are given below.

I. Support System Constraints

The constraints under this included the following variables -

i) Inadequate visit of extension personnel to farm site

ii) Lack of follow up action by extension workers

iii) Inadequate training programme on fish culture

iv) Unavailability of formulated feed

v) Lack of expected result from fish culture

vi) Lack of knowledge of soil and water quality management

Strategy-I: Providing more extension support to fish farmers

Methods/Tactics for fulfilling the strategy:

i. Specialized training and demonstration on various aspects of fish production such as water quality management, fish health management, methods of calculation and application of proper dose/rate of fishery inputs, recent advancement of fish production and marketing systems should be organized for farmers as well as for fishery extension workers by the State Fisheries Department. This will increase the efficiency of farmers, changing the productivity status of fish culture practices in the State. Translocation of proven fish culture technologies to the door steps of farmers alone may cause a paradigm shift in the productivity level of the water bodies under command of fish culture.

ii. Formulated fish feed should be made available to farmers. This can be done through establishment of Fish Feed Mill with initiation from the government with involvement of entrepreneurs/NGOs/SHGs or on public-private-partnership (PPP) mode.

iii. State Fish Laboratory established at the Directorate Complex, Guwahati for testing of soil and water quality parameters does not have easy access for farmers from remote areas. The provision for testing soil and water quality parameter should be made available at close reach of the farmers to enable them to use proper dose of lime, manures, inorganic fertilizer, medicines etc. in their ponds.
based on the result of these tests. Provisions of Fishery Clinic with soil and water testing facilities, disease diagnostic facilities, fish medicines etc. at block level can help the farmers in this regard.

iv. In line with the establishment of Veterinary Hospital in rural areas, the Government of Assam should establish Fishery Extension Unit at least one in each block with necessary infrastructure and manpower.

v. Since the ATMA model has already proven as unique model for dissemination and adoption of technologies, this model should be adopted through proper identification and formation of Farmers Interest Groups (FIGs)/Self Help Groups (SHGs), Farmers field Management Committee (FMCc), and Farmer Advisory Committee (FAC) at Panchayat/block level.

vi. The Department of Fisheries, Government of Assam should have provisions for rewarding efficient Extension Officers and the measures for maintaining accountability should be made stringent. There should be financial and non-financial incentive to extension workers to motivate them to render their sincere service for more diffusion and adoption of fish culture by fish farmers. Necessary facilities to effectively work in remote areas should be provided to the extension workers. Suitable transportation, audio-visual aids and financial provision for demonstration purpose are to be made available at right time.

II. **Infrastructural Constraints**

   This includes the following variables (constraints) –

   i)  Difficult to get good brooders during breeding
   
   ii) Lack of fishery input supplier in the locality
   
   iii) Cost of fishing net is more
   
   iv) Exploitation by middlemen
   
   v)  Lack of proper distribution channel

**Strategy-II: Providing infrastructural support to farmers**

Methods/Tactics for fulfilling the strategy:

i. To provide a suitable delivery system of fishery inputs to the fish farmers in time as well as participate in the distribution channel by framing fish producers’
consortium at rural areas. This will reduce the cost of production and distribution. This type of organized marketing of fish would be helpful in stabilizing the price which will benefit both producers and the consumers.

ii. ‘One stop Aqua Shop’ (OAS) as recommended by the DFID (Department for International Development) should be established as single outlet in strategic locations keeping all fishery inputs so that farmers can get all inputs required for fish culture such as fish seed, fish feed, fertilizer, chemicals etc. along with technological information brochures. This OAS can be named as ‘Matsy Sewa Kendra.’ OAS with different name has already been started in different parts of the country that provide significant services to the farmers (De and Saha 106).

iii. Provision for icing, packaging, and transporting fish should be provided to rural fish farmers. The Fishery Department should identify the pockets of high fish production potential in the State and build cold storage facilities in these areas. The farmers can be charged at no profit no loss basis to reach the operation cost of such facilities.

III. Financial and Technical constraint

The constraints under this included the following variables –

i) Difficult to get institutional credit

ii) Lack of good quality fish seeds of required size and number at the time of stock

iii) Difficult to identify good quality fish seed

iv) Lack of fund

Strategy-III: Providing financial and technical support to the farmers

Methods/Tactics for fulfilling the strategy:

i. Institutional credit package to support growth of culture fisheries in the State should be made available to farmers. Institutional credit should be made available at lower rate of interest and its procedure should be simple for the farmers. Making available of credit package here refers to providing the financial linkage to farmers. After confidence building of the farmers through practical training by the Government, members of the banking sector should be invited to offer a single
window loan provision in the form of loan mela where the less educated farmers be assisted in availing a loan.

ii. Formation of SHG can generate fund by themselves through collection of monthly premium from members and giving it to members at low rate of interest which will ultimately help the farmers to meet the necessary expenses of fish culture to certain extent.

iii. Since lack of quality fish seed at right time of stocking is one of the significant constraints, an attempt should be made to provide quality fish seed at the appropriate time so that productivity status of composite fish culture can increase to a significant extent. To achieve this, following steps may be considered

- The government may make an attempt to provide better quality fish seed at pond site to farmers through judicious carp breeding and hatchery management and proper distribution system.
- As quality of seed is the key element in successful fish farming, it is important to regulate the fish seed market through a mechanism that helps the farmers to get an assured supply of quality seed. Certification of hatcheries could be an option that can be considered to ensure that quality of the seed is regulated at the production stage.
- Attempts for early breeding of important cultured fishes should be taken up at public sector.
- Assam Fish Seed Act, 2005 should be strictly followed which provides guidelines for quality seed production and management.

IV) Societal Constraints

This includes-

i) Poisoning of pond

ii) Poaching

Strategy-IV: Constant monitoring and community based management

Methods/Tactics for fulfilling the strategy:

i. Employing community base watchmen to tackle the problem of poisoning and poaching.
ii. Installing substrates for periphyton growth that in turn work as hurdle to poach inside ponds

iii. Social fencing through community participation will reduce the social constraints

iv. Providing fishery insurance coverage can help mitigating the problem of poaching and poisoning.

One of the major constraints as perceived by the farmers is lack of standardized technology for indigenous fish species which have also more consumer preference. To remove this constraints the suggested strategy is -

**Strategy-V: Standardization of breeding and culture technology for high valued indigenous fish**

Methods/Tactics for fulfilling the strategy:

i. Package of practices based on location specific standardized breeding and culture technology of magur as well as other indigenous varieties of fish like koi, sol, chital, arri, pabha, moa etc. should be developed through research in agro-climatic situation of Assam so that farmers can adopt it. Technology of culture of moa (Amblypharyngodon mola) along with carp species should be explored. In Bangladesh, the government and non-governmental organizations (NGOs) have already begun to promote semi-intensive polyculture in small, seasonal ponds, using the small variety of fish moa along with carp. There was no decline in carp production as well as income when the system integrated with moa (Roos et al.).

ii. Proper conservation measures against habitat destruction and measures to stop indiscriminate fishing of these species during breeding season should be taken. In this case, Assam Fisheries Rule (1953) which was amended in 2005 should be strictly enforced creating awareness among public.
B. For Marketing intermediaries

Strategy-VI: Development of an elaborate network for handling, transporting, distributing, displaying, and holding facilities to support marketing of fish and value added fish

Methods for fulfilling the strategy:

i. Specially designed or modified tanks and containers, as well as trucks and other transport vehicles equipped with aeration or oxygenation facilities to keep fish alive during transportation should be provided with government initiation and support in initial stage.

ii. Since hygienic fresh fish handling/marketing and post harvest preservation facilities in the State are inadequate and of preliminary nature, such preservation and processing units should be established in selected potential locations by the Department of Fisheries. Both technical and financial assistance such as transportation facilities, establishment of ice plants, landing platforms, weighing sheds, cleaning tables, storage facilities, modern fish selling stalls, retail vending kiosks, etc should be provided to develop handling/marketing and post harvest infrastructure. More emphasis should be given for provision of running water facilities and proper drainage and waste disposal systems.

iii. Since fish peddlers play an important role in delivering fish at the door steps of consumers, they should be trained in carrying live and fresh fish in keeping them fresh/alive for longer periods. Insulated containers and provision of adequate ice at all stages should be provided. Making available of bi-cycle/motorcycle with built-in insulated fish boxes may serve this purpose. By improving and organizing the services of fish peddlers, it is possible to satisfy consumers through supply of fish of desired quantity/variety in fresh/live condition.

iv. Adoption of Multiple Stocking and Multiple Harvesting of carp culture technology should be encouraged in order to have regular supply of fish though out the year. Since, fluctuations of demand and supply of fish is one of the main constraints as perceived by the wholesalers, and retailers and vendors, adoption of this practice will benefit these marketing intermediaries. Hence, package of
practice of this technology should be developed by the fisheries scientists of the State and transferred to the farmers after standardization of the technology.

v. Training and demonstration programmes on scientific fish handling, cleaning, dressing and preservation (e.g., icing, refrigeration etc.) may be organized for farmers as well as marketing intermediaries at block level by experts of R & D organizations in Fisheries in the state at specific duration and frequency.

C. Strategy to overcome constraints of preparing and marketing of value added fish

Strategy-VII: Development of hygienic retail outlet, and branding of fish and fish items

Methods/Tactics for fulfilling the strategy:

i. More retail outlets (fish shops) should be established and operated at consumer-friendly locations in both rural and urban areas so that consumers can get fresh fish easily in a hygienic condition. The Department of Fisheries (Government of Assam), Assam Apex Co-operative Fish Marketing and Processing Federation Ltd. (FISHFED), business firms and SHGs should work together and take pro-active role in opening hygienic fish retail outlets.

ii. Assam Apex Co-operative Fish Marketing and Processing Federation Ltd. (FISHFED) should be more active in the fish retailing business in line with Tamil Nadu Fish Development Corporation Ltd. (TNFDC), Kerala State Co-operative Federation for Fisheries Development Ltd. (Matsyafed) and West Bengal State Fishermen’s Co-Operative Federation Ltd. (BENFISH). TNFDC operates fish retail outlets under the name of “Neidhal”. In Kerala, Matsyafed has started fish retailing outlets under the name of “Fresh Fish Point”. These retail outlets purchase fish directly from fishermen/fishermen cooperative societies and sell them to customers at reasonable prices under modern hygienic conditions. These retail outlets aim to replace/remove middlemen involved in fish marketing, thereby ensuring higher returns to fishermen and hygienic fishes to consumers at
affordable prices. Presently, these outlets source their fish from the local wholesale market, but efforts are being made to purchase fish directly from the producer (Kumar et. al 345-54).

**Strategy-VIII:** Creation of awareness among consumers about nutritional value of fish and different value added fish products

Methods for fulfilling the strategy:

i. Promotional campaign through television and radio commercials, and print media like bulletin, leaflets, news papers and street posters; etc can play an important role in creation of awareness and popularity of different value added fish and fish products. There is need of quality and weight certification for fish and fish products so that consumer can accept these without hesitation. Municipality authority or panchayats can assign these responsibilities to the department of health and to the weights and measures for ascertaining quality and weight of fish in the market.

ii. Promotional campaign about the nutritional value of fish in line with that of egg by National Egg Coordination Committee (NECC). Sales promotion activities should take into consideration the choice and preferences of husbands and wives since in majority of households in the study area husbands made decisions regarding type of fish to buy, frequency of eating fish, and purchase of fish whereas housewives took the decisions about cleaning and types of preparation of fish.

**D. Strategies for Marketing of fish in Assam**

To develop marketing strategies for fish in the study area, the STP (Segmentation, Targeting and Positioning) approach of marketing has been adopted. After segmenting the market using different demographic and geographic variables, the target market has been identified using the information revealed by the study. The position of fish to be created in the minds of the target segment has also been identified. To create the identified position, the marketing mix has been conceptualized. The following is a discussion on this issue.
a) SEGMENTATION

i. Based on geographic profile

Geographic profile

Rural
- Consumption is more compared to urban
- Frequency is more
- Eating out non existent
- Buys mostly at local market
- Prefers curry
- Prefers value addition in the form of dressing and chopping only
- Wants quality and weight to be certified

Urban
- Consumption is less compared to rural
- Frequency is high
- Eating out is more
- Buys mostly at town market
- Prefers curry
- Prefers valued addition in the form of dressing and chopping, and ready to eat fish items
- Awareness regarding availability of ready to eat fish items is high
- Wants quality and weights to be certified, improvement in market infrastructure, and regularity of supply
- Willing to pay for such value addition

ii. Based on Demographic Profile

Communities

Assamese
- Consumption is high
- Percentage of expenditure on fish over total food consumption is high
- Frequency is high
- Prefers curry

Bengali
- Consumption is high
- Percentage of expenditure on fish over total food consumption is high
- Frequency is high
- Prefers curry

Nepali
- Consumption is low
- Percentage of expenditure on fish over total food consumption is low
- Frequency is low
- Prefers curry

North Indian
- Consumption is low
- Percentage of expenditure on fish over total food consumption is medium
- Frequency is low
- Prefers curry
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<td>Fish consumption is less compared to other income groups</td>
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<td>Frequency of going to restaurant for meal is high</td>
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<td>Awareness regarding availability of ready to eat fish items is high</td>
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b) TARGETING

Target market:
From the above discussion, it is evident that Assamese and Bengali people from urban area whose monthly income is Rs.20000.00 and above can be considered as the target market.

a) POSITION
Hygienic ready to cook or eat tasty fish for nutritional supplement for the whole family.

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<tr>
<td>• Dressed and chopped fish should be marketed in hygienic condition with certification of quality and weight</td>
<td>• Price should be marginally higher to meet the expense of value addition and at the same time to give the impression of a premium product.</td>
<td>• Clean and hygienic retail outlets with refrigeration facility should be established.</td>
<td>• Promotional campaign about nutritional value of fish in line with advertisement of egg and milk should be undertaken using different electronic and print media</td>
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<td>• Preferred varieties of fish should be made available on regular basis</td>
<td>• Differential pricing strategy should be followed for different cuts of fish. Heads and tails should be priced lower compared to the other pieces.</td>
<td>• Shopping malls will be a very good distribution channel member</td>
<td>• Promotional campaign of different fish delicacies of fish should be undertaken</td>
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<td>• Fish in live and fresh condition should be offered to consumers</td>
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<td>• Another exclusive distribution channel is provided in a model described latter in this chapter.</td>
<td>• Organizing fish food festivals with good publicity where consumers get exposure to variety of fish and value added fish products</td>
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<td>• Packed and iced fish in different packet size should be made available</td>
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<td>• Branding strategy for value added fish and fish products should be formulated</td>
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<td>• Packaging should be of different cuts as done in case of chicken</td>
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<td>• Introduction of different fish items in restaurants, fast food outlets, and bars visited by the target segment.</td>
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A business model has been designed for marketing of fish and fish products and is presented in Fig. 5.1

Fig. 5.1 District level business model for fish marketing

The business model proposes that a body, whether NGO or SHG or cooperative society, take up the responsibility of collecting and distributing fish, including branded fish items with profit motive in a small geographic area centering a township. This body will take up the activity of collecting fish from the different sources like culture and capture fisheries. This body will act as a wholesaler of fish, as well as provider of ready to eat fish items through the ‘Matsya Biponi’, which will be discussed subsequently. The ideal infrastructure requirement of this body is described below. But the infrastructure
can be generated in a phased manner depending on priority. A PPP mode of operation can also be considered.

**Facilities needed:**

- Infrastructure for carrying killed (prior rigor mortis) as well as live fish
- Scaling, grading, chopping, sorting and packaging facilities
- Deboning facility

This cooperative society will act as a feeder to small retail outlets, vendors and eating joints in the township. The facilities required for maintain quality and branding of fish sold through this channel is listed below.

**Retail outlets:**

- Glass covered
- Use of hand gloves
- Refrigerator
- Provision for storing live fish
- Instant packaging
- Waste disposal system
- Market cleaning system

**Vendors:**

- Insulated pedal driven closed carts with compartments for carrying chopped iced/frozen fish, half cooked fish
- Container with aeration facility to carry live fish

**MATSYA BIPONI**

*Matsya Biponi* (MB) is proposed to be the provider of ready to eat fish to the general public. MB must be well equipped with cooking facilities and staffed with efficient cooks. The purpose of MB is to provide catering services if the order size is over a predefined size which is to be decided after doing proper costing. This service should be branded on the basis of convenience, hygiene, and taste.

Most of the experts opined that varied consumer preference may be met by development of processed fish products at affordable cost. Such facilities in the region are at an infant stage. Rigorous efforts in this direction will go a long way in making marketing of fish sustainable.
MAJOR POLICY RECOMMENDATIONS (Discussed in detail in the previous section of the current chapter):

Based on the findings of the study following major policy recommendations are suggested-

1. Since most of the fish consumers prefer live and fresh fish, it requires careful post harvest handling for extending its shelf life. Hence, all care should be taken while handling fish so that consumer satisfaction can be given as well as remunerative price can be obtained by the producers and marketing intermediaries. It is recommended to develop an elaborate network for handling, transporting, distributing, displaying, and holding facilities to support marketing of fish in live and fresh. This requires provision for specially designed or modified tanks and containers; transport vehicles equipped with aeration or oxygenation facilities to keep fish alive during transportation with government initiation and support, establishment of hygienic fish market and post harvest preservation facilities in selected potential locations by the Department of Fisheries, providing technical and financial assistance for transportation facilities, establishment of ice plants, landing platforms, weighing sheds, cleaning tables, storage facilities, modern fish selling stalls, and retail vending kiosks; and conducting training and demonstration programmes on scientific fish handling, cleaning, processing and preservation techniques.

2. The Department of Fisheries (Government of Assam), Assam Apex Co-operative Fish Marketing and Processing Federation Ltd. (FISHFED), business firms and SHGs should work together and take pro-active role in opening more hygienic fish retail outlets at consumer-friendly locations. Dressed and chopped fish should be marketed in hygienic condition with certification of quality and weight.

3. Promotional campaign using different mass media to create awareness and popularity of different value added fish and fish products with their nutritional value in line with that of egg by National Egg Coordination Committee (NECC) should be taken in order to increase consumption of fish and value added fish products.
4. The production of consumer preferred carp and non-carp varieties should be increased in order to make them available at affordable price by the consumers. Adoption of Multiple Stocking and Multiple Harvesting of carp culture technology should be encouraged in order to make regular supply of carps throughout the year. In order to achieve this, package of practice of this technology should be developed by the fisheries scientists of the State and transferred to the farmers. Package of practices based on location specific standardized breeding and culture technology of magur as well as other indigenous varieties of fish like *koi, sol, chital, ari, pabda,* and *moa* should be extended through adoptive research in agro-climatic situation of Assam so that farmers can adopt it successfully.

5. Quality fish seed at right time of stocking should be made available among fish farmers through judicious carp breeding and hatchery management and proper distribution system with initiation from Department of Fisheries, Government of Assam. Assam Fish Seed Act, 2005 should be strictly followed which provides guidelines for quality seed production and management.

6. More extension support to fish farmers should be provided. Specialized training and demonstration on varied aspects of fish production for farmers as well as for fishery extension workers, establishment of Fish Feed Mill with initiation from the government with involvement of entrepreneurs/NGOs/SHGs or on public-private-partnership (PPP) to make available formulated feed, establishment of Fishery Clinic and establishment of Fishery Extension Unit at least one in each block with necessary infrastructure and manpower should be done.
FURTHER RESEARCH

The present research is both exploratory and descriptive in nature. This research makes an important contribution to existing knowledge as it provides detailed information on fish consumption patterns depending on geographic and demographic profile. These data provide baseline information for planning consumer oriented production and trading of fish. Most of the existing studies have been concentrating either on the production side of Fish or the consumption aspect. Development of strategies after analyzing both the production and consumption aspects is a major contribution of this study to the existing body of knowledge.

The strategies proposed in the study have the potential of immediate implementation either by the Government through the Department of Fisheries, or by private organizations. The business model proposed can provide guidelines to upcoming entrepreneurs in this segment.

This study restricted itself to the marketing of fish. The production of consumer preferred fish is an area where further research is necessary. Moreover, identifying new products related to fish is another area of research which will need technological investigation and product promotion.

Fish has been an integral part of the dietary habit of the population of the study area. But marketing of fish has never been professionally looked into. This study looked into professional production, distribution, and introduction of new value added fish products. Suggestions have been put forward for professional and efficient marketing of fish and fish products. The proposed strategies can be implemented and implementation of the proposed strategies will go a long way in professional marketing of fish and fish products.