

**CONSUMERS' PREFERENCE FOR MARINE AND  
INLAND FISH – A STUDY IN BENGALURU CITY**

**NITIN KUMAR, M.S.**

**MBAL 2014**

**DEPARTMENT OF AGRICULTURAL MARKETING,  
CO-OPERATION AND BUSINESS MANAGEMENT  
UNIVERSITY OF AGRICULTURAL SCIENCES  
BENGALURU – 560 065**

**2017**

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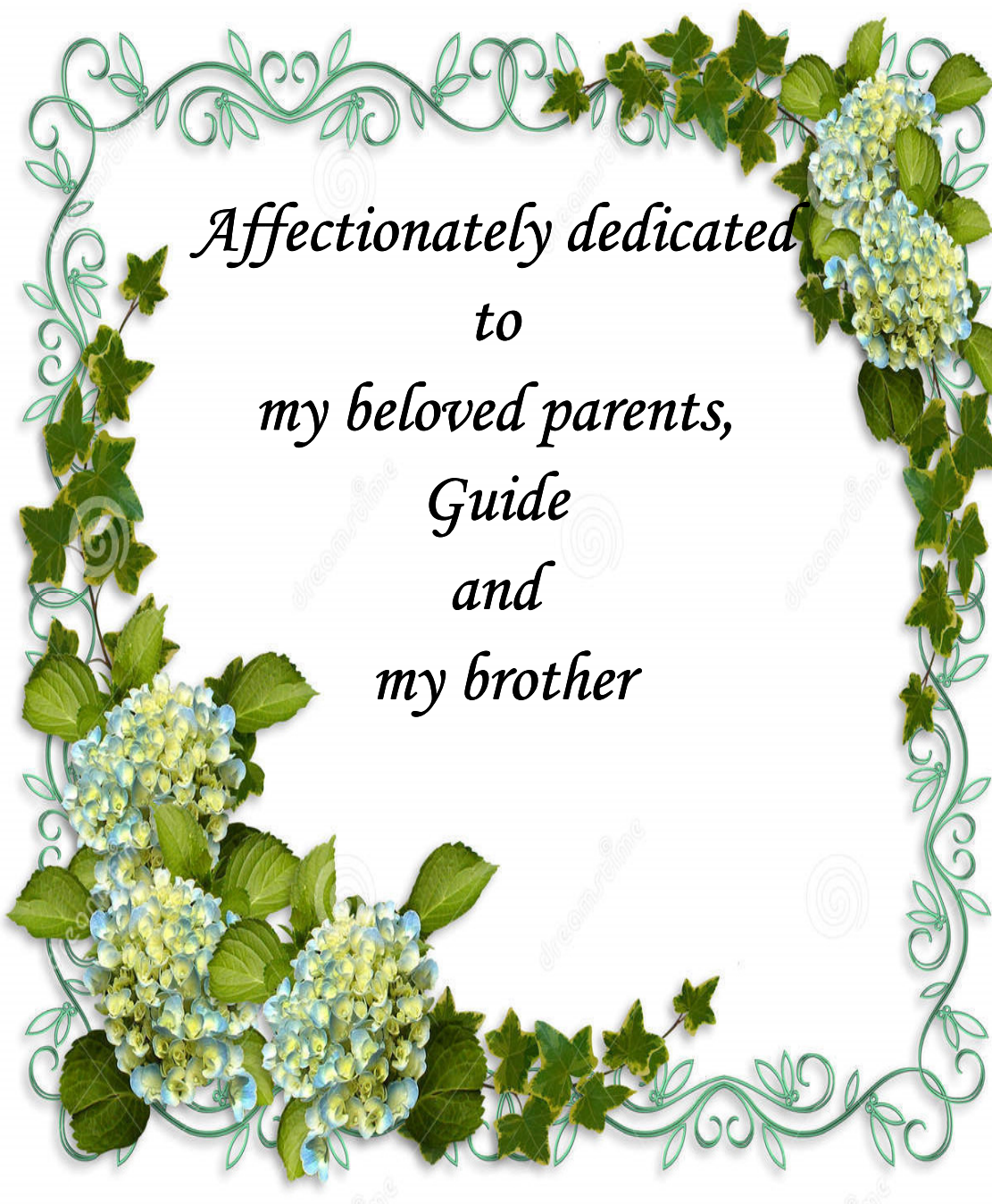
*Project Report submitted to the University of Agricultural Sciences,  
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Degree of*

**Master of Business Administration**

*(Agribusiness Management)*

**Bengaluru**

**September 2017**



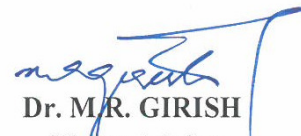
*Affectionately dedicated  
to  
my beloved parents,  
Guide  
and  
my brother*

**DEPARTMENT OF AGRICULTURAL MARKETING,  
CO-OPERATION AND BUSINESS MANAGEMENT  
UNIVERSITY OF AGRICULTURAL SCIENCES  
GKVK, BENGALURU – 560 065**

**CERTIFICATE**

This is to certify that the Project Report entitled “CONSUMERS’ PREFERENCE FOR MARINE AND INLAND FISH – A STUDY IN BENGALURU CITY” submitted by Mr. NITIN KUMAR, M.S., ID. No. MBAL 2014, in partial fulfillment of the requirements for the degree of MASTER OF BUSINESS ADMINISTRATION (Agribusiness Management) to the University of Agricultural Sciences, Bengaluru is a bonafide record of research work done by him during the period of his study in this University, under my guidance and supervision and the project work has not previously formed the basis of the award of any degree, diploma, associateship, fellowship or other similar titles.

Bengaluru,  
Date:

  
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Major Advisor

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## ACKNOWLEDGEMENT

This project report is the end of my journey in obtaining the degree of **Master of Business Administration (Agribusiness Management)**. I have not travelled in a vacuum in this journey. This project report has been kept on track and been seen through to completion with the support and encouragement of numerous people including my well-wishers and my friends. At the end of my project report, I would like to thank all those people who made this project report possible and an unforgettable experience for me.

At this moment of accomplishment, first of all, I am extremely thankful to my guide, **Dr. M.R. Girish**, Assistant Professor (Sr. Scale), Department of Agricultural Marketing, Co-operation & Business Management, University of Agricultural Sciences, GKVK, Bengaluru. This work would not have been possible without his guidance, support and encouragement. Under his guidance, I successfully overcame many difficulties and learned a lot. His unflinching courage and conviction will always inspire me and I hope to continue to work with his noble thoughts.

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**Place:** Bengaluru

**Date:** September 2017

**(NITIN KUMAR, M.S.)**

# **CONSUMERS' PREFERENCE FOR MARINE AND INLAND FISH – A STUDY IN BENGALURU CITY**

**NITIN KUMAR, M. S.**

## **Abstract**

The present study made an attempt to analyse the profile of fish consumers; factors influencing the purchase of fish by consumers; purchase behaviour of fish consumers; and the sourcing and retailing of fish by retailers in Bengaluru city. A sample comprising of 102 consumers and 20 retailers were drawn for the study. The primary data was collected from both consumers and retailers using a pre-tested structured schedule; and the same was analysed using Measures of Central Tendency and Garrett's Ranking Technique. Majority (80 %) of the fish consumers belonged to the age group of 26-50 years. The families of majority (91 %) of the respondents were nuclear in nature. With respect to food habit, majority (96 %) of the respondents were non-vegetarians by birth. With regard to the factors influencing the purchase of fish by sample consumers, the delicious factor of fish was ranked first by the consumers with a score of 69.80. With regard to the place of consumption of fish, majority (64 %) of the respondents consumed fish at home as well as outside home (restaurants). Unhygienic conditions in the shop was the major problem consumers faced while purchasing fish as opined by majority (45 %) of the respondents. Majority (50 %) of the retailers procured marine fish from Mangalore while in the case of procurement of inland fish, majority (50 %) of the retailers procured from nearby lakes. With regard to the disposal of unsold fish, majority (45 %) of the retailers preserved the fish for next day sales.

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UAS, GKVK, Bangalore - 560 065

Major Advisor  
Dr. M.R. Girish

ಕಡಲು ಮತ್ತು ಕಡಲಾಚೆಯ ಮೀನುಗಳಿಗೆ ಗ್ರಾಹಕರ ಆಧ್ಯತೆ - ಬೆಂಗಳೂರು ನಗರದಲ್ಲ ಒಂದು

## ಅಧ್ಯಯನ

ನಿತಿನ್ ಕುಮಾರ್, ಎಂ.ಎಸ್.

ಸಾರಾಂಶ

ಪ್ರಸ್ತುತ ಅಧ್ಯಯನವನ್ನು ಮೀನಿನ ಗ್ರಾಹಕರ ಆರ್ಥಿಕ ಸ್ಥಿತಿಗತಿ ವಿವರಣೆ, ಮೀನಿನ ಖರೀದಿಯನ್ನು ನಿರ್ಧರಿಸುವ ಅಂಶಗಳು, ಗ್ರಾಹಕರ ಮೀನಿನ ಖರೀದಿ ವರ್ತನೆ ಮತ್ತು ಮೀನಿನ ಚಿಲ್ಲರೆ ವ್ಯಾಪಾರ ವಹಿವಾಟನ್ನು ಪರಿಶೀಲಿಸಲು ಬೆಂಗಳೂರು ನಗರದಲ್ಲ ಕೈಗೊಳ್ಳಲಾಯಿತು. ಪ್ರಾರ್ಥಮಿಕ ಮಾಹಿತಿಯನ್ನು ಮೊದಲೇ ಪರಿಶೀಲಿಸಿದ ರಚನಾತ್ಮಕ ಪ್ರಶ್ನಾವಳಿಯನ್ನು ಬಳಸಿಕೊಂಡು ೧೦೨ ಗ್ರಾಹಕರು ಮತ್ತು ೨೦ ಚಿಲ್ಲರೆ ವ್ಯಾಪಾರಿಗಳಿಂದ ಸಂಗ್ರಹಿಸಲಾಯಿತು. ಈ ಮಾಹಿತಿಗಳಿಗೆ ಶತಾಂಶ ಸರಾಸರಿ ಭಿನ್ನಾಂಶಗಳನ್ನು ಮತ್ತು ಗ್ಯಾರೇಟ್ ಶ್ರೇಯಾಂಕವನ್ನು ಬಳಸಲಾಯಿತು. ಬಹುತೇಕ (೮೦ %) ಗ್ರಾಹಕರು ೨೬-೫೦ ವರ್ಷಗಳ ವಯೋಮಾನದಲ್ಲಿದ್ದರು. ಬಹುತೇಕರು (೯೧ %) ವಿಭಕ್ತ ಕುಟುಂಬಕ್ಕೆ ಸೇರಿದವರು ಮತ್ತು ಆಹಾರ ಅಭ್ಯಾಸ ಸಂಬಂಧಿಸಿದಂತೆ, ಬಹುಪಾಲು (೯೬ %) ಹುಟ್ಟಿನಿಂದಲೇ ಮಾಂಸಹಾರಿಗಳಾಗಿದ್ದರು. ಮೀನಿನ ಖರೀದಿಯನ್ನು ನಿರ್ಧರಿಸುವ ಅಂಶಗಳಲ್ಲಿ, ರುಚಿಯು ೬೯.೮೦ ಅಂಕಗಳೊಂದಿಗೆ ಅತ್ಯಂತ ಪ್ರಮುಖ ಅಂಶವಾಗಿತ್ತು. ಮೀನಿನ ಸೇವನೆಯ ಸ್ಥಳಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಬಹುಪಾಲು (೬೪ %) ಗ್ರಾಹಕರು ಮನೆಯಲ್ಲಿ ಹಾಗೂ ಮನೆಯ ಹೊರಗಡೆ (ಉಪಹಾರ ಗೃಹಗಳಲ್ಲಿ) ಸೇವಿಸುವರಾಗಿದ್ದರು. ಮೀನನ್ನು ಖರೀದಿಸುವಾಗ ಗ್ರಾಹಕರು ಎದುರಿಸುವ ಪ್ರಮುಖ ಸಮಸ್ಯೆಗಳಿಗೆ ಸಂಬಂಧಿಸಿದಂತೆ, ಬಹುಪಾಲು (೪೫ %) ಗ್ರಾಹಕರಿಗೆ ಅಂಗಡಿಯಲ್ಲಿನ ಅನಾರೋಗ್ಯಕರ ಪರಿಸ್ಥಿತಿಯು ಪ್ರಮುಖ ಸಮಸ್ಯೆಯಾಗಿತ್ತು. ಬಹುಪಾಲು (೫೦ %) ಚಿಲ್ಲರೆ ಮಾರಾಟದವರು ಕಡಲ ಮೀನುಗಳನ್ನು ಮಂಗಳೂರಿನಿಂದ ಸಂಗ್ರಹಿಸುತ್ತಿದ್ದರು ಹಾಗೂ ಕಡಲಾಚೆಯ ಮೀನುಗಳನ್ನು, ಬಹುಪಾಲು (೫೦ %) ಚಿಲ್ಲರೆ ಮಾರಾಟದವರು ಹತ್ತಿರದ ಕೆರೆಗಳಿಂದ ಸಂಗ್ರಹಿಸುತ್ತಿದ್ದರು. ಬಹುತೇಕ (೪೫ %) ಮಾರಾಟದವರು ಮಾರಾಟವಾಗದ ಮೀನುಗಳನ್ನು ಮರುದಿನದ ಮಾರಾಟಕ್ಕೆ ಮೀಸಲಿಡುತ್ತಿದ್ದರು.

ಸೆಪ್ಟೆಂಬರ್ ೨೦೧೭

ಕೃಷಿ ಮಾರಾಟ, ಸಹಕಾರ ಮತ್ತು  
ವ್ಯವಹಾರ ನಿರ್ವಹಣೆ ವಿಭಾಗ

ಕೃ.ವಿ.ವಿ, ಜಿ.ಕೆ.ವಿ.ಕೆ, ಬೆಂಗಳೂರು - ೫೬೦ ೦೬೫

ಪ್ರಮುಖ ಸಲಹೆಗಾರರು

ಡಾ|| ಎಂ.ಆರ್. ಗಿರೀಶ್



# Consumers' Preference for Marine and Inland Fish – A Study in Bengaluru City

Nitin Kumar, M.S., MBAL 2014, Sr. MBA (ABM)

Department of Agricultural Marketing, Co-operation and Business Management



## INTRODUCTION

- Fish is a highly nutritive food. Packed with vitamins and minerals and a major source of omega-3 fatty acids, fish can help to protect against a range of diseases, from cancer to heart disease, depression to arthritis. Fisheries are estimated to provide 16 per cent of the World population's protein.
- India, having 8129 kms long coastline, has immense potential for developing and producing a variety of sea foods. The value of GDP from fisheries sector at current prices during 2011-12 was Rs. 76,699 crores which was about 4.15 per cent of the total GDP from agriculture and allied sectors.
- Karnataka state has emerged as major fish producing state since 1956. The contribution of fisheries sector to state's GDP at current prices was Rs. 2,10,913 lakhs in 2010-11.

## OBJECTIVES

- To examine the profile of fish consumers in Bengaluru city.
- To analyze the factors influencing the purchase of marine and inland fish by consumers.
- To analyze the purchase behaviour of marine and inland fish consumers.

## METHODOLOGY

- Study area**
- The study was conducted in Bengaluru city.
- Nature and sources of data**
- For the study, primary data was collected from fish consumers of Bengaluru city. A sample of 34 fish consumers each were drawn from Bengaluru North, Bengaluru South and Bengaluru Central regions using a pre-tested structured schedule.
- Analytical tools and techniques**
- Descriptive statistics
  - Garrett's ranking
  - Regression analysis

## RESULTS

Table 1: Socio-economic profile of fish consumers

Particulars	Group	Number of Consumers	Percentage
Age	<25	8	7.84
	25-50	86	84.31
	>50	8	7.84
Gender	Male	90	88.24
	Female	12	11.76
Literacy level	Upto S.S.L.C.	16	15.69
	P.U.C.	20	19.61
	Degree	53	51.96
	P.G.	13	12.75
Type of family	Nuclear	93	91.18
	Joint	9	8.82
Occupation	Government	20	19.61
	Private	34	33.33
	Business	28	27.45
	Student	12	11.76
	Housewife	8	7.84
Family income/month	<25000	36	35.29
	26000-50000	32	31.37
	51000-75000	22	21.57
	76000-100000	4	3.92
	>100000	8	7.84
Food habit	Non-vegetarian	98	96.08
	Vegetarian	4	3.92

Table 2: Factors influencing the decision regarding purchase of marine and inland fish

Sl. No.	Factors	Average scores	Rank
1	Nutritious	67.40	III
2	Delicious	71.33	II
3	Functional food	72.17	I
4	Price	38.61	VIII
5	Quality	45.65	VI
6	Dietary habit	45.43	VII
7	Easily available	56.78	IV
8	Familiarity	29.93	IX
9	Easy to cook	54.38	V
10	Others	18.00	X

## DISCUSSION

- All the sample respondents were literates and about 52 per cent of them were graduates. This is quite obvious in a metropolitan city like Bengaluru.
- Majority (91 %) of the families of the sample respondents were nuclear in nature. This is again quite obvious as nuclear family is the order of the day in the present modern situation.
- Among the factors which influence the purchase of marine and inland fish, the functional food attribute of the fish was ranked I with average score of 72.17 followed by delicious factor (rank II with average score of 71.33) and nutritional factor (rank III with average score of 67.40). The reason being fish as a food is not only delicious and nutritious but also is a functional food as it also provides benefits related to health.

## GRAPHS

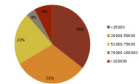


Fig.1: Monthly family income of fish consumers.

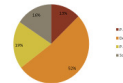


Fig.2: Literacy level of the fish consumers



## SUMMARY

- Majority (84 %) of the respondents who were involved in buying fish from markets / outlets belonged to the age group of 25-50 years.
- Majority (52 %) of the respondents were graduates and majority (91%) of the families were nuclear in nature.
- The functional food attribute of the fish was the most important factor which influenced the purchase of marine and inland fish. The other important factors were delicious and nutritional attributes.

## ADVISORY COMMITTEE

Chairperson – Dr. M.R. Girish

### Members

- Dr. G.N. Nagaraja
- Dr. H. Chandrashekar
- Mr. T.N. Venkata Reddy

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## I INTRODUCTION

Fishes are aquatic vertebrates which respire with gills and lack limbs with digits. It is believed that fishes came to planet before 415 million years. A chance discovery in 1955 revealed an extensive fossil bed dating from Devonian Period. This 360-370 million years old fossil deposit contains the remains of thousands of freshwater fish.

Fishing and aquaculture in India has a long history. Kautilya's Arthashastra (321–300 B.C.) and King Someswara's Manasottara (1127 A.D.) each refer to fish culture. For centuries, India has had a traditional practice of fish culture in small ponds in Eastern India. Significant advances in productivity were made in the state of West Bengal in the early nineteenth century with the controlled breeding of carp in *Bundhs* (tanks or impoundments where river conditions are simulated). Fish culture received notable attention in Tamil Nadu as early as 1911, subsequently; States such as West Bengal, Punjab, Uttar Pradesh, Gujarat, Karnataka and Andhra Pradesh initiated fish culture through the establishment of Fisheries Departments. In 2006, the Indian Central Government initiated a dedicated organization focussed on fisheries, under its Ministry of Agriculture.

Fish is a good source of readily digestible, high-quality animal protein. It is high in lysine and sulphur amino acids which makes it particularly suitable for complementing the high-carbohydrate diet prevailing in much of India. Fish can serve as a valuable source of vitamins A and D if its oil is ingested. Fish is also a good source of minerals such as phosphorus and iron. Fish bones, which may be eaten in small fish such as sardines, are particularly rich in calcium and phosphorus. Marine species have significant levels of iodine and of omega-3 fish oils, which are effective in maintaining safe levels of blood cholesterol and triglycerides. Since fish, including its meat, bones and organs, contains good amounts of vitamin A, iron and iodine, it may be useful in combating the specific nutritional deficiency which can result in nutritional blindness, anaemia and goitre.

Fish also has value as an energy source. It can be difficult to get sufficient energy from rice and other bulky carbohydrates, especially for small children. With its high

nutrient density, fish can make an important contribution to the energy supplies of people at risk of malnutrition.

Apart from the specific nutrients it can provide, fish has a number of distinctive qualities. Many find its taste and texture to be appealing. It is easily cooked and readily digested; and it is widely available. As flavouring, it can help to make rice and other bland foods more palatable and thus promote their consumption in larger quantities. Fish reduced to a paste or powder form can be very useful as a protein-rich weaning food.

On a unit weight basis, fish is relatively expensive in comparison with vegetables and grains and it is also more costly than other alternative animal protein sources. In relation to its nutritional value, it can be quite inexpensive, even compared with vegetable protein source.

The major disadvantage of fish is high perishability. However, there are numerous methods for preserving fish such as drying, smoking and canning. Such processing can also increase its attractiveness and its convenience for use.

### **1.1 Global Overview of Fisheries Sector**

Global fish production has grown steadily in the last five decades with food fish supply increasing at an average annual rate of 3.2 per cent, outpacing world population growth at 1.6 per cent. The world per capita apparent fish consumption increased from an average of 9.9 kgs in the 1960s to 19.2 kgs in 2012. This impressive development has been driven by a combination of population growth, rising incomes and urbanization and facilitated by the strong expansion of fish production and more efficient distribution channels.

China has been responsible for most of the growth in fish availability, owing to the dramatic expansion in its fish production, particularly from aquaculture. Its per capita apparent fish consumption also increased at an average annual rate of six per cent in the period 1990–2010 to about 35.1 kgs in 2010. The annual per capita fish supply in the rest of the world was about 15.4 kgs in 2010 (11.4 kgs in the 1960s and 13.5 kgs in the 1990s). Despite the surge in annual per capita apparent fish consumption in developing

regions (from 5.2 kgs in 1961 to 17.8 kgs in 2010) and low-income food-deficit countries (LIFDCs) (from 4.9 to 10.9 kgs), developed regions still have higher levels of consumption, although the gap is narrowing.

Global fishery production in marine waters was 82.6 million tonnes in 2011 and 79.7 million tonnes in 2012. Eighteen countries (11 in Asia) caught more than an average of one million tonnes per year, accounting for more than 76 per cent of global marine catches.

Global inland waters capture production reached 11.6 million tonnes in 2012, but its share in total global capture production still does not exceed 13 per cent.

Employment in the sector has grown faster than the world's population. In 2012, it represented 4.4 per cent of the 1.3 billion people economically active in the broad agriculture sector world-wide (2.7 % in 1990). Overall, women accounted for more than 15 per cent of all people directly engaged in the fisheries primary sector in 2012. The proportion of women exceeded 20 per cent in inland water fishing and up to 90 per cent in secondary activities (e.g. processing). FAO estimates that, overall, fisheries and aquaculture assure the livelihoods of 10–12 per cent of the world's population.

The proportion of fisheries production used for direct human consumption increased from about 71 per cent in the 1980s to more than 86 per cent (136 million tonnes) in 2012, with the remainder (21.7 million tonnes) destined to non-food uses (e.g. fishmeal and fish oil).

Fish remains among the most traded food commodities world-wide. In 2012, about 200 countries reported exports of fish and fishery products. The fishery trade is especially important for developing nations, in some cases accounting for more than half of the total value of traded commodities. In 2012, it represented about 10 per cent of total agricultural exports and one per cent of world merchandise trade in value terms.

China is, by far, the largest exporter of fish and fishery products. However, since 2011, it has become the world's third-largest importing country, after the United States of

America and Japan. The European Union is the largest market for imported fish and fishery products and its dependence on imports is growing.

## **1.2 Indian Scenario**

Indian fisheries and aquaculture is an important sector of food production, providing nutritional security to the food basket, contributing to the agricultural exports and engaging about fourteen million people in different activities. With diverse resources ranging from deep seas to lakes in the mountains and more than 10 per cent of the global biodiversity in terms of fish and shellfish species, the country has shown continuous and sustained increments in fish production since independence. India stands second in global fish production. Further, India stands number two in the sectors of inland capture and aquaculture and number seven in marine capture production. Constituting about 6.3 per cent of the global fish production, the sector contributes to 1.1 per cent of the GDP and 5.15 per cent of the agricultural GDP. The total fish production of 10.07 million metric tonnes presently has nearly 65 per cent contribution from the inland sector and nearly the same from culture fisheries.

The country has 429 Fish Farmers Development Agencies (FFDAs) and 39 Brackishwater Fish Farms Development Agencies (BFDAs) for promoting freshwater and coastal aquaculture. The annual carp seed production is to the tune of 25 billion and that of shrimp about 12 billion, with increasing diversification in the recent past. Along with food fish culture, ornamental fish culture and high value fish farming are gaining importance in the recent past. With over 2.4 lakh fishing crafts operating in the coast, six major fishing harbours, 62 minor fishing harbours and 1511 landing centres are functioning to cater to the needs of over 3.9 million fisherfolk.

Fish and fish products have presently emerged as the largest group in agricultural exports of India, with 10.51 lakh tonnes in terms of quantity and Rs.33,442 crores in value.

This accounts for around 10 per cent of the total exports of the country and nearly 20 per cent of the agricultural exports. More than 50 different types of fish and shellfish products are exported to 75 countries around the world.

India has an extensive coastline and excellent freshwater sources. Approximately 11 per cent of the world's seafood species are found in India. Out of these 2,200 species, around two-thirds (or 1,440 species) are part of the marine ecosystem, which includes the Arabian Sea and the Bay of Bengal while the rest are divided between warm freshwaters, including lakes and rivers, brackish waters or estuaries where seawater mixes with fresh water from rivers and cold freshwaters.

Pomfret, bhetki, rohu, catla, mackerel, bombay duck and surmai (king mackerel) are the most popular fish species that are consumed in India. Pomfret is well known for soft, white and relatively boneless flesh while bhetki is considered as tastiest fish among the boneless fishes. Rohu and catla are the most popular members of carp family. Mackerels are found in abundance along the peninsular India whose flesh is high in healthy oil. King mackerels are the most priced fish of Southern and Western India whose flesh is firm and oily with meaty texture.

### **1.3 Fish Production in Karnataka**

Karnataka state emerged as a maritime State in 1956 with the reorganization of the States. An independent Department of Fisheries was set up in 1957. Since then, the Department of Fisheries has been consistently striving hard for overall development of fisheries and of fishermen by implementing several developmental schemes both in marine and inland sectors. The fisheries sector plays an important role in the socio-economic development of State, in view of its contribution to the food basket, nutritional security, large foreign exchange earnings, employment generation and income.

The fish production in Karnataka was around two lakh tonnes in early eighties and reached to a peak of over three lakh tonnes in mid nineties. The average fish production in the last five years is about 2.73 lakh tonnes with the contribution of marine sector being 64 per cent and inland sector 36 per cent. The fish production from the state contributed about 4.8 per cent of India's total fish production. The fish production in 2013-14 was 3,57,357.86 kgs of marine fish and 197952.14 kgs of inland fish, resulting in total fish production of 5,55,310 kgs.

#### **1.4 Importance of the study**

About 94 per cent of all fisheries occur in developing countries. They provide food and livelihood for millions of the world's poorest people and also contribute to the overall economic well-being by means of export commodity trade, tourism and recreation. Fish is a low-fat high quality protein. Fish is filled with omega-3 fatty acids and vitamins such as D and B<sub>2</sub>. Fish is rich in calcium and phosphorus and a great source of minerals, such as iron, zinc, iodine, magnesium, and potassium. Human bodies don't produce omega-3 fatty acids and hence, it has to be obtained through food. Omega-3 fatty acids are found in every kind of fish.

The present study is a modest attempt to analyse the profile of fish consumers; factors influencing the purchase of fish by consumers; purchase behaviour of fish consumers; and the sourcing and retailing of fish by retailers. The study is confined to a detailed enquiry of consumers' preference for marine and inland fish in Bengaluru city. For the study, a sample of 102 respondents was purposively drawn. The specific objectives with which the research was conducted were:

1. To examine the profile of fish consumers in Bengaluru city.
2. To analyze the factors influencing the purchase of marine and inland fish by consumers.
3. To analyze the purchase behaviour of marine and inland fish consumers.
4. To analyze the sourcing and retailing of marine and inland fish by retailers.

#### **Hypotheses of the study**

1. Fish is mainly consumed by the affluent class.
2. Price is the main factor that influences the purchase of marine and inland fish.
3. Majority of the consumers buy fish on a weekly basis.
4. The retailers source marine fish mainly from Mangalore.
5. The main source of inland fish to retailers is local markets.

## **II REVIEW OF LITERATURE**

In this chapter, an attempt has been made to critically review the literature of the past research work relevant to the present study. The available literature on the subject has been reviewed and presented under the following headings.

2.1 Profile of consumers of perishable commodities

2.2 Factors influencing the purchase of perishable commodities

2.3 Purchase behaviour of consumers towards perishable commodities

2.4 Sourcing and retailing of perishable commodities by retailers

### **2.1 Profile of consumers of perishable commodities**

Thakare and Gupta (2005) studied the consumer preference for mushrooms in selected districts (Raipur, Durg and Bilaspur) of Chhattisgarh. Majority of the consumers were aware of the nutritive value of mushrooms (urban: 93.7 %; rural: 75.0 %) and preferred fresh mushrooms (urban: 81.2 %; rural: 68.7 %). Oyster mushroom was the most preferred variety by rural consumers (75.0 %) while oyster and white button mushrooms by more than 90 per cent of the urban consumers. Majority (71 %) of rural consumers used mushrooms as a vegetable. High income consumers (33.7 %) were more likely than low (21.3 %) and medium (27.4 %) income groups to buy mushrooms at a higher price. About 75 per cent and 44 per cent of rural and urban consumers, respectively, believed that mushrooms are not sufficiently available in the market. It was concluded that the consumers in the selected districts have high preference for mushrooms.

Gowda (2009) analyzed the consumers' preference for retail formats in Bengaluru city. He reported that majority (27.50 %) of the consumers belonged to the income group of Rs. 30,000-40,000 followed by Rs. 20,000 - Rs. 30,000 (23.33 %), Rs. 40,000 - Rs. 50,000 (16.67 %), Rs. 10,000 - Rs. 20,000 (15.83 %), Rs. 50,000 and above (13.33 %) and upto Rs. 10,000 (3.33 %). He also reported that majority (68.33 %) of the sample

respondents were graduates followed by post graduates (25 %), PUC level (4.17 %) and SSLC level (2.50 %).

Das *et al.* (2011) studied the behaviour of fish consumers at selected fish markets of Tripura, India. They found that 86.87 per cent of the respondents were male while the rest (13.13 %) were females. About 54 per cent of the consumers had a family size of five to seven followed by those (32.5 %) who had family size of two to four while the remaining (13.37 %) consumers had a family size of more than seven.

Padmavathi (2011) in her study analyzed the general characteristics of sample consumers of mango products in Bengaluru city. She reported that majority (36 %) of the consumers belonged to the income group of Rs. 6,000 - Rs. 15,000 followed by Rs. 25,000 and above (33 %) and Rs. 15,001 - Rs. 25,000 (31 %). She also reported that the families of majority (56 %) of the consumers consisted of four to five members followed by families comprising of more than five members (26 %) and those comprising upto three members (18 %).

Ranjitha (2011) analyzed the general characteristics of consumers of jaggery in Mandya district of Karnataka. She reported that majority (40 %) of the consumers had education upto PUC followed by graduation (33.33 %) and by those (30 %) who had education upto SSLC.

Ravibhushana (2011) analyzed the socio-economic profile of consumers of value added products of potato in Bengaluru city. He reported that majority (72 %) of the consumers belonged to the age group of 21 to 30 years followed by 31 to 40 years, more than 41 years and upto 20 years accounting for 20 per cent, six per cent and two per cent respectively. He also reported that the families of majority (38 %) of the sample consumers were small (less than 3 members) followed by medium families (3 - 5 members) and large families (more than 5 members) accounting for 32 per cent and 30 per cent respectively.

Bharath (2012) analyzed the consumer's preference for store formats in Bengaluru city. He reported that majority (36.67 %) of the consumers belonged to the age group of 31 to 40 years followed by 20 to 30 years (25.83 %), 41 to 50 years (24.17 %)

and above 50 years (13.33 %). He also reported that majority (44.17 %) of the respondents were housewives, followed by professionals (35.88 %), academicians (8.33 %), businessmen (5 %), students (5 %) and respondents employed in BPOs (1.67 %).

Chandraprabha (2012) analyzed the consumer's preference for value added products of tomato in Bengaluru city. She reported that majority (56 %) of the consumers belonged to the age group of 31 to 50 years followed by above 50 years (40 %) and upto 30 years (4 %).

Mugaonkar *et al.* (2012) studied the awareness and perception among consumers of organized fish retail outlets regarding seafood labeling in India. They found that the socio-economic background of individuals affects their buying behaviour. They reported that the average age of the respondents was 41 years with 16.34 years of schooling, family size of four and average earnings of Rs. 39,067 per month per family.

Srinivas (2013) studied the preferences of women consumers for grocery items in Hyderabad city. Among the consumers who preferred branded grocery products, 67 per cent belonged to the age group 25-35 years followed by 36-45 years (23 %) and above 45 years (10 %). With regard to preference for unbranded grocery products, majority (43 %) of the consumers belonged to the age group of above 45 years followed by 36-45 years (39 %) and 25-35 years (18 %).

## **2.2 Factors influencing the purchase of perishable commodities**

Balaji (1985) studied fish consumption behaviour in Vishakhapatnam city. The study revealed that 77 per cent of respondents consumed fish for dinner and 22 per cent for lunch. About 30 per cent of the respondents did not consume fish on festival days, as those days were considered auspicious while the rest had no restrictions and consumed fish, irrespective of festivals.

Puri and Sanghera (1989) conducted a survey to know the consumption pattern of processed products in Chandigarh. Jam was found to be most popular irrespective of income. Orange squash consumption was maximum in high and middle-income families. Pineapple juice consumption increased with a rise in the income.

Inamke *et al.* (1995) conducted a study to identify the factors influencing the milk consumption behaviour of urban and rural consumers in western Maharashtra. The results indicated that for both, urban and rural consumers, family income was the factor that most significantly influenced milk consumption. The family size and occupation were the other significant factors influencing consumption of milk.

Singh *et al.* (1995) studied the factors influencing consumer preferences for milk in Hisar city. The factors like convenient availability, flavour, colour, freshness and mode of payment decided levels of consumer satisfaction.

Oei (1991) conducted a study on mushroom cultivation in Nigeria. He reported that the price for mushroom is affected by several factors including regional preferences, the species and quality, the season, whether sold fresh or consumed, whether sold for wholesale distribution or to end consumers. The results indicated that consumers showed preference for exotic mushroom (over local variety). This is because of the perceived better flavour, texture, appearance / cleanliness, longer shelf-life, perceived less or no poison threat and availability.

Hugar and Kumar (1996) studied the factors influencing the consumption of vegetables in Dharwad district of Karnataka. The study revealed that education level and gender had significant influence on the quality and frequency of consumption as females purchased more when compared to males. The income and price also had a significant influence on the quantity purchased.

Amitha (1998) analyzed the factors influencing the consumption of selected dairy products in Bengaluru city. The results of the study revealed that income and price significantly influenced the consumption of table butter. Price had a negative impact while income had a positive impact on consumption of table butter.

Prell *et al.* (2002) analyzed the factors influencing adolescent's fish consumption in a Scandivian school. They found that attitude towards fish, friends' behaviour and perceived control were important predictors of the intention to eat fish. The barriers for fish consumption were negative attitude towards smell and fear of finding bones. The consumers were more satisfied with taste, texture and appearance of fish. They also

thought to a greater extent that the fish was healthy and was prepared with care. The results suggested that it was important to alter dishes so that they appeal to children and to pay attention to the whole meal.

Devlin *et al.* (2003) conducted a study on means-end chain analysis of the food sector in UK. The study used laddering methodology to identify the linkages between food retail store attributes and personal values. The study reported that at the attribute level, "good quality products", "good reputation", "store has additional services" and "value for money" are most sought after. These were linked to the consequences "feel good" and to "save time". Overall, the findings supported previous value-driven research, concluding that "happiness" and "quality of life" were the most strived for personal values.

Usharani and Reddy (2004) studied consumption pattern of milk and milk products of 240 households (120 each from high and middle income groups) in Hyderabad. The results showed that the consumption of milk and milk products was influenced by the knowledge on the availability of nutrients and the income level of the respondents. Liquid milk was the major item of daily consumption. Ice cream was the popular milk product showing growth potential inspite of certain concerns in its frequent consumption.

Elsholz (2009) in her research on seafood labelling and consumer behaviour in Sonoma County, California. The study found that seafood purchases at Oliver's Markets were overwhelming driven by seafood attributes such as taste, texture, freshness and smell, and perceived health benefits no matter what type of seafood was purchased.

### **2.3 Purchase behaviour of consumers of perishable commodities**

Becker *et al.* (2000) studied the consumer perception on fresh meat quality in Germany. They found that majority (60 %) of the consumers purchased pork meat from butchers followed by supermarket (28 %), directly from farmers (7 %) and other available sources (5 %).

Hugar *et al.* (2001) analyzed the dynamics of consumer behaviour in vegetable marketing in Dharwad city. They found out that low-income group purchased lesser quantity (3.25 kgs / week) of vegetables as compared to medium-income (5.40 kgs / week) and high-income groups (4.66 kgs / week). Majority of low-income families preferred to purchase vegetables from producers because of reasonable prices. The high-income and medium-income groups preferred stall vendors for the purchase of vegetables because of better quality and correct weighment.

Al-Mazrooei *et al.* (2003) studied the purchase behaviour of consumers of seafood products in Muscat. They found that about 76 per cent of the respondents preferred on-shore fish markets for purchasing seafood while the remaining 24 per cent of respondents preferred fish shops and retail outlets.

Radman *et al.* (2005) examined the preferences and buying behaviour of beef consumers in Tuscany, Italy. They found that 58 per cent of the consumers occasionally consumed beef in restaurants while the remaining (42 %) never ate beef outside their home. They also found that male consumers (69 %) ate meat more often in restaurants than female consumers (48 %). They concluded that beef was not the most preferred meat among Tuscany consumers but there were still a large number of consumers who ate beef two-three times a week. The results of the study indicated that men and older consumers had stronger preferences towards beef compared to younger consumers and women. However, younger consumers were more willing to pay higher price for extra quality beef.

Vanhonacker *et al.* (2010) studied the fish market segmentation based on consumers' motives, barriers and risk perception in Belgium. They found out that uncertain fish consumers indicated strong motives and a low risk perception but experienced some barriers to increase their fish consumption. Fish lovers did not perceive any risk from eating fish and expressed strong motives and low barriers. Finally, concerned fish consumers perceived few barriers and they scored relatively moderate on fish consumption motives.

Asawathy *et al.* (2011) analyzed the marketing and utilization of marine bycatch in India. The study included estimated landings of low-value food fishes, price analysis of low-value food fishes and trash fish, marketing channels of fishes along coastal belts of India, fishermen's share in consumer rupee. They stated that proper quality should be maintained by hygienic handling and packing of fresh fish needs to be undertaken for improving consumer demand in urban markets.

Kumar and Babu (2014) analyzed the factors influencing the buying behaviour of dairy products in Pudhucherry town in Pondicherry. They found that consumer loyalty was built by consistent quality, taste and freshness and concluded that Ponlait was the market leader of dairy products in the town of Pudhucherry. Ponlait was ranked first in price, taste, quality, availability and packaging.

#### **2.4 Sourcing and retailing of perishable commodities by retailers**

Nagaraj and Achoth (1989) conducted a study on economic analysis of fruit processing by Karnataka Agro Fruits Limited in Bengaluru city. They noted that almost all the fruits except mango were procured through Horticultural Producers Co-operative Marketing and Processing Society Limited (HOPCOMS). Mango was purchased directly from the producer-farmer.

Ganney (1989) studied the status of mushroom marketing in U.K. and indicated that outlets for mushrooms were diverse. The author identified that 60 per cent of the U.K. mushroom sales was through retail outlets, 33 per cent through catering or food processing outlets and the remaining proportion directly into cans during the period 1984-85. Although the information on the penetration of imported mushrooms was limited, the author opined that there was growth of supplies to the larger retailers. Until 1985, retailers were mainly supplied with U.K. produce but in 1986, 26 per cent of mushrooms sold were produced at Holland.

Ku and Lee (1989) studied the marketing of mushrooms in Taiwan. They observed that the farmers had to bring their produce to mushroom collection stations in the production areas for weighing and removing casing soils. The canners or frozen-food factories sent lorries to the stations to collect mushrooms for processing once a day in the

morning. The farmers were allowed to sell 50 kgs of mushroom from a bed surface of 3.3 sq. meters at a guaranteed price. Mushrooms beyond this quantity were usually sold to domestic fresh markets through regional distributor at variable prices.

Singh and Chaube (1995) studied the marketing of mushrooms in Uttar Pradesh. They suggested that mushroom should be immediately disposed off after harvest and consumed within 2-3 days or canned. They reported that there was no proper marketing channel. Besides internal markets, external markets had to be explored. For this, they suggested to introduce co-operative units of “Mushroom Growers” which cater to both production and disposal of the product. They referred to one such co-operative unit in the state functioning as Doon Ghati Mushroom Co-operative Samiti Ltd., Dehradun established in 1984 catering to the production inputs as well as marketing.

Connor (1999) reviewed the literature on empirical studies of competition in the US food-retailing industry, with special attention to a few studies that attempt to cope with new forms of horizontal and vertical competition. With the end of the 'supermarket revolution' in the 1970s, new forms of horizontal, vertical and geographic competition have appeared to challenge the supremacy of the supermarket format. New retail formats like warehouse stores, super centres and fast-food outlets appear to affect local retail supermarket prices. Slotting allowances, coupons and electronic data gathering have intensified retailer-manufacturer rivalry. Foreign direct investment offers the promise of new European-style management styles in US grocery retailing.

Rosecky and King (2000) conducted a study on differences in the source of market and the basket price. They found that the accepted economic theory suggests that the prices of commonly available products in competitive markets are likely to be approximately the same. If monopoly prices can be extracted, the resulting profits attract competitors into the market. They examined the prevailing prices in detail for a large number of commonly available supermarket products in France, United Kingdom and USA. The results of this study showed that some products have very similar or the same prices and other products have different pricing pattern.

Ramadhani (2002) conducted a study on marketing of indigenous fruits in Zimbabwe. He suggested that there was a substantial amount of trading and consumption

of the fruits in both rural and urban areas of Zimbabwe. The marketing system was characterized by lack of production as all fruits were collected from the natural forests. There were numerous collectors and retailers but a few wholesalers. There was also no sophisticated product differentiation. There was lack of an adequate price formation mechanism as prices were based on information from neighbours, knowledge of previous seasons and total cost incurred by traders.

Michels *et al.* (2003) analyzed the behavior of consumers of fresh organic products sold at retail outlets in Germany. The study revealed that almost all food retailers in Germany sold organic products, fresh ones being estimated at 45 per cent of the turnover. Surveys indicated that 49.7 per cent of households bought fresh products, principally vegetables, atleast once between April and December 2002. Vegetables, fruits, potatoes and eggs were the main categories on offer in supermarket-type outlets; specialist whole food shops and producers' direct marketing enterprises carried a wider range of produce including meat. About 77 per cent of turnover by the larger retailers was from sales to regular purchasers. The average frequency of purchasing, however, was not over 5 times in 9 months. The younger customers tend to buy from specialist outlets rather than supermarkets.

Chen and Guo (2013) analyzed strategic sourcing in the presence of uncertain supply and retail competition at International level. They considered a common supplier that sells its uncertain supply to two downstream retail firms engaged in price competition in a horizontally differentiated product market. The focal firm has a dual-sourcing option while the rival firm can only source from the common supplier. They found that the focal firm's dual-sourcing strategy can create a win-win situation that leads to increased retail prices and expected profits for both firms. Furthermore, under certain conditions, they showed that it is beneficial for the focal firm to strategically source from the common supplier, even if its alternative supplier offers a lower wholesale price. Overall, they identified two types of incentives for adopting the dual-sourcing strategy: the incentive of mitigating supply risk through supplier diversification and the incentive of strategic sourcing for more effective retail competition.

### **III METHODOLOGY**

The present study was undertaken to examine the profile of fish consumers; to analyze the factors influencing the purchase of marine and inland fish by consumers; and to analyze the purchase behaviour of marine and inland fish consumers. This chapter covers the following aspects:

3.1 Description of study area

3.2 Sampling design and data collection

3.3 Analytical tools

3.4 Garrett's Ranking technique

#### **3.1 Description of study area**

##### **3.1.1 Geographical location**

Bangalore, officially known as Bengaluru is the capital city of Karnataka. Located on the Deccan Plateau in the south-eastern part of Karnataka, Bengaluru is India's third most populous city and fifth-most populous urban agglomeration. Bengaluru is known as the "Silicon Valley of India" because of its role as the nation's leading Information Technology exporter. Located at a height of over 3,000 feet (914.4 m) above sea level, Bengaluru is known for its pleasant climate throughout the year. The city is amongst the top ten preferred entrepreneurial locations in the World. It is positioned at 12.97°N 77.56°E and covers an area of 1,741 sq. kms. Majority of the city of Bengaluru lies in the Bengaluru Urban district of Karnataka and the surrounding rural areas are a part of the Bengaluru Rural district. The region comprising the Bengaluru Urban and Rural districts is known as the Bengaluru (region). The Government of Karnataka has carved out the new district of Ramanagara from the old Bengaluru Rural district.

##### **3.1.2 Climate and rainfall**

Bengaluru experiences a tropical savanna climate with distinct wet and dry seasons. Due to its high elevation, Bengaluru usually enjoys a more moderate climate

throughout the year, although occasional heat waves can make things very uncomfortable in the summer. The coolest month is January with an average low temperature of 15.1 °C (59.2 °F) and the hottest month is April with an average high temperature of 35 °C (95 °F). The highest temperature ever recorded in Bengaluru is 39.2 °C (103 °F) (recorded on 24<sup>th</sup> April 2016). However, the suburbs of Bengaluru recorded temperatures as high as 41 °C (106 °F). The lowest ever recorded is 7.8 °C (46 °F) (recorded in January 1884). Winter temperatures rarely drop below 12 °C (54 °F) and summer temperatures seldom exceed 37 °C (99 °F). Bengaluru receives rainfall from both the north-east and the south-west monsoons and the wettest months are September, October and August, in that order. The summer heat is moderated by fairly frequent thunderstorms, which occasionally cause power outages and local flooding. The heaviest rainfall recorded in a 24-hours period is 179 millimeters recorded on 1<sup>st</sup> October 1997.

### **3.1.3 Demographic characteristics**

With an estimated population of 8.5 million in 2011, Bengaluru is the fifth most populous city in India and the 18<sup>th</sup> most populous city in the World. Bengaluru was the fastest-growing Indian metropolis after New Delhi between 1991 and 2001; with a growth rate of 38 per cent during the decade. The cosmopolitan nature of the city has resulted in the migration of people from other States to Bengaluru, which has in recent years given rise to tensions between immigrants and locals. The Scheduled Castes and Tribes account for 14.3 per cent of the city's population. Various languages are spoken and understood, namely, Kannada, English, Tamil, Hindi and Telugu. According to the 2001 Census of India, 79.4 per cent of Bangalore's population is Hindu, roughly the same as the national average. Muslims comprise 13.4 per cent of the population, which again is roughly the same as the national average while Christians and Jains account for 5.8 per cent and 1.1 per cent of the population, respectively; double that of their national averages. The Anglo-Indians also form a substantial group within the city. Women make up 47 per cent of Bangalore's population. The city has a literacy rate of 89 per cent. Roughly 10 per cent of Bangalore's population lives in slums, a relatively low proportion when compared to other cities in the developing World such as Mumbai (50 %) and Nairobi (60 %).

## **3.2 Sampling design and data collection**

### **3.2.1 Sampling design**

The study was conducted in Bengaluru city. A sample of 102 consumers were drawn for the present study. In addition, 20 retailers were also drawn for the study resulting in a total sample of 122.

The general information collected included name of the consumer, age, gender, locality, education, nature, size and composition of family, occupation, family income and food habit.

The specific information elicited included the information pertaining to comparative preference of the consumers for marine fish and inland fish, factors influencing consumers decision to purchase marine and inland fish, place of consumption, decision-maker regarding purchase of fish, species of fish, place of purchase, frequency of purchase, quantity per purchase, price paid per purchase, preferred species of marine and inland fish and problems the consumers come across in purchasing, storing and usage of fish.

### **3.2.2 Nature and sources of data**

Primary data was collected from both consumers and retailers using a pre-tested structured schedule.

## **3.3 Analytical tools**

The data collected from the respondents was analysed using Measures of Central Tendency and Garrett's Ranking.

### **3.4 Garrett's Ranking Technique**

Garrett's ranking technique was used to rank the factors influencing the purchase of marine and inland fish by consumers, based on their importance. The order of the merit given by the consumers was converted into per cent position using the formula.

Per cent position =  $100 * (R_{ij} - 0.5) / N_j$

where,

$R_{ij}$  = rank given for  $i^{\text{th}}$  factor by  $j^{\text{th}}$  individual

$N_j$  = number of factors ranked by  $j^{\text{th}}$  individual

The per cent position of each rank then converted into scores referring to the table given by Garrett and Woodworth (1969). For each factor, the scores of individual respondents were added together and divided by the total number of the respondents for whom scores were added. These mean scores for all the factors were arranged in descending order, ranks were given and the most important factors were identified.

## IV RESULTS

The results of the analysis carried out for fulfilling the objectives of the study are presented under the following headings.

- 4.1 Socio-economic profile of fish consumers in Bengaluru city
- 4.2 Factors influencing purchase of marine and inland fish by consumers
- 4.3 Details pertaining to purchase of marine and inland fish by consumers
- 4.4 Category and species-wise preference and place of consumption of fish by consumers
- 4.5 Decision-maker in the family regarding purchase of fish
- 4.6 Details pertaining to the source of purchase of fish by consumers
- 4.7 Opinion of consumers regarding availability of preferred species of fish and problems faced during purchase, storage and usage
- 4.8 Opinion of consumers regarding price and quality of fish
- 4.9 Opinion of consumers regarding factors promoting increased consumption of fish
- 4.10 Category-wise procurement of fish by retailers
- 4.11 Methods of disposal of unsold fish by retailers

### **4.1 Socio-economic profile of fish consumers in Bengaluru city**

Table 4.1 presents the socio-economic profile of sample fish consumers of Bengaluru city. Majority (80.39 %) of the fish consumers belonged to the age group of 26-50 years followed by age groups of, upto 25 years (11.76 %) and above 50 years (7.84 %). With respect to gender, majority (88.24 %) of them were male respondents and the rest (11.76 %) were female respondents. With regard to literacy level of sample consumers, majority (51.96 %) of them were graduates followed by those who had education upto PUC (35.29 %) and post-graduates (12.75 %).

**Table 4.1: Socio-economic profile of fish consumers in Bengaluru city**

(n = 102)

Sl. No.	Characteristics	Category	Consumers	
			Number	Per cent
1.	Age (years)	Upto 25	12	11.76
		26-50	82	80.39
		Above 50	8	7.85
		<b>Total</b>	<b>102</b>	<b>100</b>
2.	Gender	Male	90	88.24
		Female	12	11.76
		<b>Total</b>	<b>102</b>	<b>100</b>
3.	Literacy level	Upto PUC	36	35.29
		Graduate	53	51.96
		Post-graduate	13	12.75
		<b>Total</b>	<b>102</b>	<b>100</b>
4.	Occupation	Government employee	20	19.61
		Private employee	34	33.33
		Self-employed	28	27.45
		Student	12	11.76
		Housewife	8	7.84
		<b>Total</b>	<b>102</b>	<b>100</b>
5.	Type of family	Nuclear	93	91.18
		Joint	9	8.82
		<b>Total</b>	<b>102</b>	<b>100</b>
6.	Size of family	Upto 3	40	39.22
		4-7	58	56.86
		Above 7	4	3.92
		<b>Total</b>	<b>102</b>	<b>100</b>
7.	Food habit	Non-vegetarian	98	96.08
		Vegetarian	4	3.92
		<b>Total</b>	<b>102</b>	<b>100</b>
8.	Family income / month	Upto 25,000	36	35.29
		25,001-50,000	32	31.37
		50,001-1,00,000	26	25.49
		Above 1,00,001	8	7.85
		<b>Total</b>	<b>102</b>	<b>100</b>

Majority (33.33 %) of the sample consumers were found to be working in the private sector, followed by those who were self-employed (27.45 %), Government employee (19.61 %), students (11.76 %) and housewives (7.84 %).

Majority (91.18 %) of the families of the respondents were nuclear in nature while that of remaining (8.82 %) were joint families. The family size of majority (56.86 %) of the consumers ranged from 4-7 followed by those (39.22 %) who had family size of upto three members while the remaining (3.92 %) had family size of above seven members. With respect to food habit, majority (96.08 %) of the consumers were found to be non-vegetarians while the remaining (3.92 %) were vegetarians.

With regard to monthly household income, majority (35.29 %) of the consumers belonged to the income group of upto Rs. 25,000 followed by income groups of Rs. 25,001 to Rs. 50,000 (31.37 %), Rs. 50,001 to Rs. 1,00,000 (25.49 %) and above Rs. 1,00,000 (7.85 %).

#### **4.2 Factors influencing purchase of marine and inland fish by consumers**

Table 4.2 presents the factors influencing the purchase of marine and inland fish by sample consumers. Based on the mean Garrett's score, the delicious factor of the fish was ranked first by the consumers with a score of 69.80 followed by the factors, viz., functional food (Garrett's score of 69.61), easily available (Garrett's score of 54.85), easy to cook (Garrett's score of 51.40), quality of fish (Garrett's score of 40.41), dietary habit of the consumers (Garrett's score of 38.12) and price of fish (Garrett's score of 26.80).

**Table 4.2: Factors influencing purchase of marine and inland fish by consumers**

**(n = 102)**

<b>Sl. No.</b>	<b>Factors</b>	<b>Mean Garrett's score</b>	<b>Rank</b>
1.	Delicious	69.80	I
2.	Functional food	69.61	II
3.	Easily available	54.85	III
4.	Easy to cook	51.40	IV
5.	Good quality	40.41	V
6.	Dietary habit	38.12	VI
7.	Price	26.80	VII

### 4.3 Details pertaining to purchase of marine and inland fish by consumers

Table 4.3 presents the details pertaining to purchase of marine and inland fish by sample consumers. With regard to frequency of purchase, it was found that majority (47.06 %) of the consumers purchased fish once in a month followed by those (37.25 %) who purchased once in a fortnight and the rest (15.69 %) once in a week.

With respect to the quantity of marine and inland fish bought per purchase by the consumers, it was found that majority (47.06 %) of them purchased upto 1.50 kgs of fish per transaction followed by those (32.35 %) who purchased quantities ranging from 1.51 to 3 kgs and the rest (20.59 %) above 3 kgs of fish per transaction.

Regarding the amount paid per purchase of marine and inland fish by the consumers, it was found that majority (54.90 %) of them spent upto Rs. 750 per transaction followed by those (23.53 %) who spent amounts ranging from Rs. 750 to 1,250 and the rest (21.57 %) spent above Rs. 1,250 per transaction.

**Table 4.3: Details pertaining to purchase of marine and inland fish by consumers**

(n = 102)

Sl. No.	Particulars	Consumers		
		Number	Per cent	
1.	Frequency of purchase	Monthly	48	47.06
		Fortnightly	38	37.25
		Weekly	16	15.69
		<b>Total</b>	<b>102</b>	<b>100</b>
2.	Quantity / purchase (kgs.)	Upto 1.50	48	47.06
		1.51 to 3	33	32.35
		Above 3	21	20.59
		<b>Total</b>	<b>102</b>	<b>100</b>
3.	Amount paid / purchase (Rs.)	Upto 750	56	54.90
		751 to 1,250	24	23.53
		Above 1,250	22	21.57
		<b>Total</b>	<b>102</b>	<b>100</b>

#### 4.4 Category and species-wise preference and place of consumption of fish by consumers

Table 4.4 presents the category and species-wise preference and place of consumption of fish by sample consumers. Majority (71.60 %) of the consumers preferred marine fish for consumption, followed by those (15.70 %) who preferred inland fish while the rest (12.70 %) were indifferent to the category of fish.

**Table 4.4: Category and species-wise preference and place of consumption of fish by consumers**

(n = 102)

Sl. No.	Particulars		Consumers	
			Number	Per cent
1.	Category	Marine fish	73	71.60
		Inland fis	16	15.70
		Either marine / inlan	13	12.70
		<b>Total</b>	<b>102</b>	<b>100</b>
2.	Species*	Pomfret	50	49.02
		Mackerel	13	12.75
		Seer	17	16.67
		Sardine	8	7.84
		Rohu	65	63.73
		Catla	42	41.18
		Not aware	10	9.80
		<b>Total</b>	<b>102</b>	<b>100</b>
3.	Place of consumption	Only at home	37	36.27
		Home and outside	65	63.73
		<b>Total</b>	<b>102</b>	<b>100</b>

\*multiple responses

With regard to the preference for fish species among consumers, it was found that majority (63.73 %) of them preferred rohu followed by pomfret (49.02 %), catla (41.18

%), seer (16.67 %), mackerel (12.75 %) and sardine (7.84 %). The remaining (9.80 %) consumers were not aware about the fish species they consumed.

With respect to the place of consumption of fish by consumers, it was found that majority (63.73 %) of the consumers consumed fish at home as well as outside home (restaurants and functions) while the remaining (36.27 %) consumers consumed fish only at home.

#### 4.5 Decision-maker in the family regarding purchase of fish

Table 4.5 presents the decision-maker in the family with regard to purchase of fish by sample consumers. It was found that the head of the family was the decision-maker in majority (39.22 %) of the families followed by kids (36.37 %), wife (15.79 %) and elders (8.82 %).

**Table 4.5: Decision-maker in the family regarding purchase of fish**

(n = 102)

Sl. No.	Decision-maker	No. of families	Per cent
1.	Family head	40	39.22
2.	Kids	37	36.37
3.	Wife	16	15.79
4.	Elders	9	8.82
5.	<b>Total</b>	<b>102</b>	<b>100.00</b>

#### 4.6 Details pertaining to the source of purchase of fish by consumers

Table 4.6 presents the details pertaining to the source of purchase of fish by sample consumers. It was found that majority (60.78 %) of the consumers purchased fish from local vendors while the rest (39.22 %) of them purchased from local markets. Among the factors influencing the source of purchase of fish, it was found that the proximal availability was the major factor for 52 per cent of the respondents followed by availability in fresh form (36.27 %) and availability in chicken / mutton stalls (3.93 %).

However, about eight per cent of the consumers opined that they did not have any other option and accordingly, purchased based on the source available.

**Table 4.6: Details pertaining to the source of purchase of fish by consumers**  
(n = 102)

Sl. No.	Particulars		Consumers	
			Number	Per cent
1.	Source of purchase	Local markets	40	39.22
		Local vendors	62	60.78
		<b>Total</b>	<b>102</b>	<b>100.00</b>
2.	Factors influencing the source of purchase	Proximal availability	53	51.96
		Available in fresh form	37	36.27
		Available in chicken / mutton stalls	4	3.93
		No other option	8	7.84
		<b>Total</b>	<b>102</b>	<b>100.00</b>

#### 4.7 Opinion of consumers regarding availability of preferred species of fish and problems faced during purchase, storage and usage

Table 4.7 presents the opinion of sample consumers with regard to availability of preferred species of fish and the problems faced during purchase, storage and usage of fish. For majority (88.20 %) of the consumers, the preferred fish species was available in the market at the time of purchase while for the rest (11.80 %) it was not so. In case of non-availability of the preferred species of fish, majority (83.33 %) of the consumers purchased the species available while the rest (16.67 %) of them did not purchase the other species available.

Majority (64.71 %) of the consumers opined that they faced problems during purchase, storage and usage of fish while the rest (35.29 %) of them didn't face any

problems. Among the problems faced, unhygienic conditions in shops was the major problem for majority (45.45 %) of the consumers. The unpleasant odour of fish was another problem for about 44 per cent of the consumers while the poor shelf-life of fish was a problem for about 23 per cent of them.

**Table 4.7: Opinion of consumers regarding availability of preferred species of fish and problems faced during purchase, storage and usage**

(n = 102)

Sl. No.	Particulars		Consumers	
			Number	Per cent
1.	Availability of preferred species of fish	Yes	90	88.20
		No	12	11.80
		<b>Total</b>	<b>102</b>	<b>100.00</b>
2.	Response in case of non-availability of preferred species	Purchase other species	10	83.33
		Do not purchase	2	16.67
3.	Problems faced during purchase, storage and usage	Yes	66	64.71
		No	36	35.29
		<b>Total</b>	<b>102</b>	<b>100.00</b>
4.	Problems expressed*	Unhygienic conditions in shop	30	45.45
		Spoils quickly	15	22.73
		Unpleasant odour	29	43.94

\*multiple responses

#### 4.8 Opinion of consumers regarding price and quality of fish

Table 4.8 presents the opinion of sample consumers with respect to price and quality of fish. Majority (67.35 %) of the consumers opined that the price of the fish was expensive while the rest (32.65 %) of them felt that the price was reasonable.

Majority (72.5 %) of the consumers opined that they were satisfied with the quality of fish they purchased while the remaining (27.5 %) were not satisfied with the quality of fish. All the consumers who were not satisfied with the quality of fish informed that the unhygienic conditions in shops was the main reason for their dis-satisfaction. About 14 per cent of them informed that the non-freshness of fish was another reason for their dis-satisfaction.

**Table 4.8: Opinion of consumers regarding price and quality of marine and inland fish**

(n = 102)

Sl. No.	Particulars		Consumers	
			Number	Per cent
1.	Price	Expensive	69	67.35
		Reasonable	33	32.65
		<b>Total</b>	<b>102</b>	<b>100.00</b>
2.	Quality	Satisfied	74	72.50
		Not satisfied	28	27.50
		<b>Total</b>	<b>102</b>	<b>100.00</b>
3.	Reasons for dis-satisfaction*	Unhygienic conditions in shops	28	100.00
		Non-freshness of fish	4	14.29

\*multiple responses

#### 4.9 Opinion of consumers regarding factors promoting increased consumption of fish

Table 4.9 presents the opinion of consumers with regard to factors that would promote increased consumption of fish. Based on the mean Garrett's score, reasonable price of fish was ranked first with a score of 64.47 followed by the factors, viz., nutritional information about fish (Garrett's score of 60.19), species with less bones (Garrett's score of 55.85), proximal availability of fish (Garrett's score of 54.17), odourless species (Garrett's score of 47.88), information about the source of fish (Garrett's score of 43.45), information about fish recipes (Garrett's score of 38.42) and enhanced shelf-life of fish (Garrett's score of 35.38).

**Table 4.9: Opinion of consumers regarding factors promoting increased consumption of fish**

(n = 102)

Sl. No.	Factors	Garrett Mean Score	Rank
1.	Reasonable price	64.47	I
2.	Information about its nutrition	60.19	II
3.	Species with less bones	55.85	III
4.	Proximal availability	54.17	IV
5.	Odourlessness	47.88	V
6.	Information about its source	43.45	VI
7.	Information about fish recipes	38.42	VII
8.	Enhanced shelf-life	35.38	VIII

#### 4.10 Category-wise procurement of fish by retailers

Table 4.10 presents the category-wise procurement of fish by retailers. Majority (50 %) of the retailers procured marine fish from Mangalore followed by those (35 %) who procured from Mangalore and coastal belts of Tamil Nadu, Kerala, Andhra Pradesh, Goa, Maharashtra, etc. while the remaining (15 %) retailers procured fish from local markets.

With respect to procurement of inland fish, majority (50 %) of the retailers procured from nearby lakes followed by those (30 %) who procured from local markets while the rest (20 %) procured fish from Nellore.

**Table 4.10: Category-wise procurement of fish by retailers**

(n=20)

Sl. No.	Category	Source	Number of retailers	Per cent
1.	Marine fish	Mangalore	10	50
		Mangalore and coastal belts of Tamil Nadu, Kerala, Andhra Pradesh, Goa, Maharashtra, etc.	7	35
		Local markets	3	15
		<b>Total</b>	<b>20</b>	<b>100</b>
2.	Inland fish	Nellore	4	20
		Nearby lakes	10	50
		Local markets	6	30
		<b>Total</b>	<b>20</b>	<b>100</b>

#### 4.11 Methods of disposal of unsold fish by retailers

Table 4.11 presents the methods of disposal of unsold fish by retailers. Majority (45 %) of the retailers preserved the fish for next day sales followed by those (35 %) who sold it to nearby hotels at cheaper prices while the remaining (20 %) retailers used the unsold fish for their own hotels.

**Table 4.11: Methods of disposal of unsold fish by retailers**

**(n=20)**

<b>Sl. No.</b>	<b>Method of disposal</b>	<b>Number</b>	<b>Per cent</b>
1.	Preserve for next day sales	9	45
2.	Sell to nearby hotels at cheaper prices	7	35
3.	Use for own hotels	4	20
4	<b>Total</b>	<b>20</b>	<b>100</b>

## V DISCUSSION

The discussions regarding the results of the analysis carried out for fulfilling the objectives of the study are presented under the following headings.

- 5.1. Socio-economic profile of fish consumers in Bengaluru city
- 5.2. Factors influencing purchase of marine and inland fish by consumers
- 5.3. Details pertaining to purchase of marine and inland fish by consumers
- 5.4. Category and species-wise preference and place of consumption of fish by consumers
- 5.5. Decision-maker in the family regarding purchase of fish
- 5.6. Details pertaining to the source of purchase of fish by consumers
- 5.7. Opinion of consumers regarding availability of preferred species of fish and problems faced during purchase, storage and usage
- 5.8. Opinion of consumers regarding price and quality of fish
- 5.9. Opinion of consumers regarding factors promoting increased consumption of fish
- 5.10. Category-wise procurement of fish by retailers
- 5.11. Methods of disposal of unsold fish by retailers

### **5.1 Socio-economic profile of the consumers of marine and inland fish**

Majority (80.39 %) of the consumers belonged to the age group of 26 – 50 years (Table 4.1) followed by age groups of upto 25 years (11.76 %) and above 50 years (7.84 %). With respect to gender of the respondents, majority (88.24 %) of them were males indicating the dominance of males in purchase of marine and inland fish. Similar finding was reported by Das *et al.* (2013) pertaining to fish purchases by consumers in Tripura. All the respondents were literates. Since, the study was conducted in Bengaluru city; it is quite obvious to expect the respondents to have atleast minimum level of education. With respect to occupation of the consumers, majority (33.33%) of them were working in the

private sector. This may be due to the fact that opportunities in the private sector are far more when compared to that in Government sector. Majority (91.18 %) of the families of the respondents were nuclear in nature. This is again quite obvious as nuclear family is the order of the day in the present modern situation. Majority (56.86 %) of the families had family size ranging between 4 & 7.

Since fish is a non-vegetarian food, the food habit of majority (96.08 %) of the consumers was non-vegetarian in nature by birth. With regard to monthly household income of fish consumers, majority (35.29 %) of them belonged to the income group of upto Rs. 25000. Though, this was not accepted in a city like Bengaluru, it may be due to the choice of the selection of the sample. Hence, the null hypothesis that “Fish is mainly consumed by affluent class” has been rejected.

## **5.2 Factors influencing purchase of marine and inland fish by consumers**

Among the various factors influencing purchase of marine and inland fish, the delicious factor of fish was ranked first by the consumers with a mean Garrett’s score of 69.80 (Table 4.2). Fish is one of the most delicious non-vegetarian food available and hence, naturally deliciousness was the most important factor which influenced its consumption. Hence, the null hypothesis that “Price is the main factor that influences the purchase of marine and inland fish” has been rejected. The second important factor influencing fish consumption was functional food factor (Garrett’s score of 69.61). In the present day modern World, people are becoming more and more health conscious and they prefer foods which are also functional in nature (foods with health benefits). Fish is one of the functional foods as it is rich in proteins and omega-3 fatty acids. The negligible difference between the Garrett’s scores of delicious factor and functional food factor clearly highlights the importance of both these factors in influencing purchase of marine and inland fish by consumers. The easy availability of fish was the third important factor (Garrett’s score of 54.85), indicating the growing sedentary lifestyle among people in metropolitan cities, where people anticipate their tasks to be accomplished quickly without risk. The other factors which influenced the purchase of fish were the ease with which fish can be cooked, quality of fish and dietary habit of consumers. Generally, price is an important factor influencing the purchase of a good. However, in the present study,

the sample consumers were relatively insensitive to fish prices; and purchased fish as it formed an important item of their consumption basket. Hence, price was ranked seventh among the factors considered with a Garrett's score of 26.80.

### **5.3 Details pertaining to purchase of marine and inland fish by consumers**

Majority (47 %) of the consumers purchased fish on a monthly basis (Table 4.3). Hence, the null hypothesis that "Majority of the consumers purchase fish on a weekly basis" has been rejected. Around 37 per cent of the consumers purchased fish on a fortnightly basis while the remaining (16 %) purchased fish on a weekly basis. The respondents opined that since fish is a functional food, rich in proteins and omega-3 fatty acids, they consumed regularly. The consumption pattern of the consumers endorses the importance of fish in their dietary habits.

Majority (47.06 %) of the consumers purchased upto 1.50 kgs of fish per transaction. This may be due to the fact that majority (91 %) of the families of consumers were nuclear in nature and hence, purchased quantities of upto 1.50 kgs of fish which was ideal quantity for their consumption. However, about 32 per cent of the respondents purchased fish ranging from 1.51 to 3 kgs per transaction followed by those (20.59 %) who purchased above 3 kgs per transaction.

With regard to the amount paid per purchase of fish, it was found that majority (54.90 %) of the respondents incurred expenditure upto Rs. 750 per transaction followed by those (23.53%) who paid amount ranging from Rs. 751 to 1,250 while the rest (21.57 %) paid above Rs. 1,250 per transaction. *Ceteris paribus*, the amount paid towards purchase of fish per transaction is a function of the quantity purchased. Infact, the expenditure incurred per transaction is directly proportional to the quantity of fish purchased. Hence, the respondents incurred expenditure in relation to the quantity of fish purchased per transaction.

### **5.4 Category and species-wise preference and place of consumption of fish by consumers**

Majority (71.60 %) of the sample consumers preferred marine fish (Table 4.5) followed by inland fish (15.70 %) while the rest (12.70 %) of the consumers were

indifferent as they were not particular about the category of fish for consumption. The consumers opined that marine fish species are more nutritious and delicious than inland fish species. In addition, they also informed that some of the inland water bodies are polluted with toxic heavy metals and obviously, fish reared in such circumstances pose health risks to human health when consumed. However, Das *et al.* (2013) in their study on behaviour of fish consumers in Tripura found that majority (87 %) of the consumers preferred locally produced fish rather than marine and brackish water fish.

Among the fish species, Rohu was found to be the most preferred species (63.73 %) followed by Pomfret (49.02 %), Catla (41.18 %), Seer (16.67 %), Mackerel (12.75 %) and Sardine (7.84 %). Around 10 per cent of consumers were not aware of the names of fish species and they purchased as per the vendor's guidance. Rohu and catla are familiar among consumers as they are the major inland fish species. Pomfret was preferred mainly because of its good taste and fewer bones. In addition, the consumers opined that due to fewer bones; consumption of pomfret by children is safe.

With regard to the place of consumption of fish, majority (63.73 %) of the sample respondents consumed fish both at home and outside (restaurants and functions) while the rest (36.27 %) of them consumed fish only at home. Fish consumption at home calls for adequate time as it involves buying, cleaning and cooking while consumption in restaurants was a more convenient option given the present cosmopolitan environment, where most people are constrained from the point of time. In addition, the availability of a variety of fish dishes in restaurants also influenced their place of consumption.

### **5.5 Decision-maker in the family regarding purchase of fish**

In majority (39.22 %) of the families, the family head was the decision-maker with respect to purchase of fish (Table 4.5) followed by kids (36.37 %), wife (15.79 %) and elders (8.82 %). This is quite obvious as in the Indian context; generally, the family head dominates in decision-making pertaining to affairs of the family. In addition, the children also play an important role in decisions pertaining to choice of their food at home. As usual, the role of wives and elders is limited in decision-making.

## **5.6 Details pertaining to the source of purchase of fish by consumers**

Majority (60.78 %) of the sample consumers purchased fish from local vendors (Table 4.6) while the rest (39.22 %) purchased from local markets. With regard to the factors influencing the source of purchase of fish, it was found that the proximal availability was the major factor for majority (51.96 %) of the consumers. This is quite obvious as the demand for fish is a function of its proximal availability. The availability of fish in fresh form was the major factor for about 36 per cent of the consumers. As fish is highly perishable in nature, its availability in fresh form also influenced the source of purchase of fish. However, for about four per cent of the consumers, the availability of fish in chicken / mutton stalls influenced their source of purchase.

## **5.7 Opinion of consumers regarding availability of preferred species of fish and problems faced during purchase, storage and usage**

For majority (88.20 %) of the sample consumers, the preferred species of fish was available in the market at the time of purchase while for the rest (11.80 %) of them it was not so (Table 4.7). The demand for a particular good determines its supply in the market. Hence, the fish species in demand, i.e., the preferred ones were generally available in the market. With regard to the response by consumers in the event of non-availability of the preferred species at the time of purchase, about 83 per cent of them bought the species available as per the advice of vendors while the rest, i.e., around 17 per cent of them did not purchase the species available. This clearly indicates that most of the fish consumers who couldn't find the preferred fish species in the market at the time of purchase were not actually very particular about the preferred species as they bought the species available.

With regard to the problems faced during purchase, storage and usage of fish, about 65 per cent of the consumers mentioned that they do so while the rest (35 %) informed that they didn't face any problems. The unhygienic conditions in shops was the major problem faced as opined by majority (45.45 %) of the consumers. This is due to the reason that generally the premises of fish vendors are poorly maintained. The unpleasant odour and poor shelf-life of fish were the other problems faced during purchase, storage

and usage of fish as opined by 43.94 per cent and 22.73 per cent, respectively. Though, fish is relished by consumers through a variety of dishes, a good number of them do not like its odour. As mentioned earlier, due to the highly perishable nature of fish, they have very poor shelf-life.

### **5.8 Opinion of consumers regarding price and quality of fish**

About 67 per cent of sample consumers opined that the price of fish is expensive (Table 4.8). On one hand, fish is a functional food and on the other, there is an increasing trend in demand for fish over the years. Hence, fish is priced accordingly; and infact, the prices are headed north. However, about 33 per cent of the consumers informed that the prices of fish were reasonable given the health benefits due to its consumption. Majority (72.50 %) of the consumers opined that they were satisfied with the quality of fish they purchased while the rest (27.50 %) weren't so. The main reason for dis-satisfaction was the unhygienic conditions prevailing in shops as opined by all the dis-satisfied consumers. As mentioned earlier, this is due to the reason that generally the premises of fish vendors are poorly maintained. Another reason for dis-satisfaction was non-freshness of fish as informed by about 14 per cent of them.

### **5.9 Opinion of consumers regarding factors promoting increased consumption of fish**

Among the various factors promoting increased consumption of fish, reasonable price was the most important factor with mean Garrett's score of 64.47 (Table 4.9). It is a well known fact that the demand for a good is inversely proportion to its price and hence, reasonable prices of fish would promote increased consumption. The second most important factor was information about its nutrition (Garrett's score of 60.19). Fish being rich in proteins and omega-3 fatty acids, has its own unique health benefits. Hence, enriching the consumers' knowledge about the nutritional value of fish would promote enhanced consumption of fish. The third important factor was species with less bones (Garrett's score of 55.85). Generally, most fish species contain lot of bones and hence, is a hindrance to easy consumption, especially, for kids. Therefore, fish species with relatively less bones would definitely promote enhanced consumption. The other

important factors promoting increased consumption of fish were proximal availability (Garrett's score of 54.17), odourlessness (Garrett's score of 47.88), information about the source of fish (Garrett's score of 43.45), information about fish recipes (Garrett's score of 38.42) and enhanced shelf-life of fish (Garrett's score of 35.38).

#### **5.10 Category-wise procurement of fish by retailers**

Majority (50 %) of the sample retailers procured marine fish from Mangalore (Table 4.10). This is because Mangalore is the most important source of marine fish for Karnataka. Hence, the null hypothesis that "The retailers source marine fish mainly from Mangalore" has been accepted. Thirty-five per cent of the retailers procured fish from Mangalore as well as coastal belts of Tamil Nadu, Kerala, Andhra Pradesh, Goa, Maharashtra, etc. Regular supply of a commodity / product is a pre-requisite for the smooth conduct and success of retailing. The same is the case with fish. These retailers were assured of regular supplies of fish as they had long standing association with fish suppliers of adjacent states. The remaining (15 %) retailers purchased fish from local markets as they found it convenient and less risky.

With respect to inland fish procurement, majority (50 %) of the retailers found it convenient to procure from nearby lakes. This is because of the proximity and cost-effectiveness of the source of supply. Hence, the null hypothesis that "The main source of inland fish to retailers is local markets" has been rejected. Thirty per cent of the retailers procured fish from local markets as they found it convenient and less risky. The remaining (20 %) retailers procured fish from Nellore.

#### **5.11 Methods of disposal of unsold fish by retailers**

Unsold stock in any retailing, especially in fish retailing is quite common. The retailers had their own methods of disposal of unsold fish. Majority (45 %) of the retailers preserved the unsold fish for next day sales as this is quite common among most retailers (Table 4.11). Thirty-five per cent of the retailers disposed-off the unsold fish to nearby hotels at cheaper prices, keeping in mind the risks involved in storing fish. The remaining (20 %) retailers used the unsold fish for their own hotels.

## **VI SUMMARY AND RECOMMENDATIONS**

Fishes are aquatic vertebrates which respire with gills and lack limbs with digits. It is believed that fishes came to planet before 415 million years. A chance discovery in 1955 revealed an extensive fossil bed dating from Devonian Period. This 360-370 million years old fossil deposit contains the remains of thousands of freshwater fish.

Fish is a good source of readily digestible, high-quality animal protein. It is high in lysine and sulphur amino acids which makes it particularly suitable for complementing the high-carbohydrate diet prevailing in much of India. Fish can serve as a valuable source of vitamins A and D if its oil is ingested. Fish is also a good source of minerals such as phosphorus and iron. Fish bones, which may be eaten in small fish such as sardines, are particularly rich in calcium and phosphorus. Marine species have significant levels of iodine and of omega-3 fish oils, which are effective in maintaining safe levels of blood cholesterol and triglycerides. Since fish, including its meat, bones and organs, contains good amounts of vitamin A, iron and iodine, it may be useful in combating the specific nutritional deficiency which can result in nutritional blindness, anaemia and goitre.

Apart from the specific nutrients it can provide, fish has a number of distinctive qualities. Many find its taste and texture to be appealing. It is easily cooked and readily digested; and it is widely available. As flavouring, it can help to make rice and other bland foods more palatable and thus promote their consumption in larger quantities. Fish reduced to a paste or powder form can be very useful as a protein-rich weaning food.

Global fish production has grown steadily in the last five decades with food fish supply increasing at an average annual rate of 3.2 per cent, outpacing world population growth at 1.6 per cent. The world per capita apparent fish consumption increased from an average of 9.9 kgs in the 1960s to 19.2 kgs in 2012. This impressive development has been driven by a combination of population growth, rising incomes and urbanization and facilitated by the strong expansion of fish production and more efficient distribution channels.

Indian fisheries and aquaculture is an important sector of food production, providing nutritional security to the food basket, contributing to the agricultural exports and engaging about fourteen million people in different activities. With diverse resources ranging from deep seas to lakes in the mountains and more than 10 per cent of the global biodiversity in terms of fish and shellfish species, the country has shown continuous and sustained increments in fish production since independence. India stands second in global fish production. Further, India stands number two in the sectors of inland capture and aquaculture and number seven in marine capture production. Constituting about 6.3 per cent of the global fish production, the sector contributes to 1.1 per cent of the GDP and 5.15 per cent of the agricultural GDP. The total fish production of 10.07 million metric tonnes presently has nearly 65 per cent contribution from the inland sector and nearly the same from culture fisheries.

The present study is a modest attempt to analyse the profile of fish consumers; factors influencing the purchase of fish by consumers; purchase behaviour of fish consumers; and the sourcing and retailing of fish by retailers. The specific objectives with which the research was conducted were:

1. To examine the profile of fish consumers in Bengaluru city.
2. To analyze the factors influencing the purchase of marine and inland fish by consumers.
3. To analyze the purchase behaviour of marine and inland fish consumers.
4. To analyze the sourcing and retailing of marine and inland fish by retailers.

## **6.1 Methodology**

Bengaluru is one of the fastest growing cities in India and is branded as ‘Silicon Valley of India’ for heralding and spearheading the growth of information Technology (IT) based industries in the country. With the advent and growth of IT industry, as well as numerous industries in other sectors and the onset of economic liberalization since the early 1990s, Bengaluru has taken lead in service-based industries fuelling substantial

growth of the city both economically and spatially. Bengaluru has become a cosmopolitan city attracting people and business alike, within and across nations.

The study was conducted in Bengaluru city. A sample of 102 consumers were drawn for the present study. In addition, 20 retailers were also drawn for the study.

Primary data was collected from both consumers and retailers using a pre-tested structured schedule.

The data collected from the respondents was analysed using Measures of Central Tendency and Garrett's Ranking.

## **6.2 Major findings of the study**

- ❖ Majority (80 %) of the consumers belonged to the age group of 26-50 years.
- ❖ Majority (88 %) of the respondents were males.
- ❖ All the respondents were literates.
- ❖ Majority (33 %) of the respondents were working in private sector.
- ❖ The families of majority (91 %) of the respondents were nuclear in nature.
- ❖ Majority (57 %) of the families had family size ranging between 4 and 7.
- ❖ With respect to food habit, majority (96 %) of the consumers were non-vegetarian in nature by birth.
- ❖ Majority (35 %) of the respondents belonged to the monthly income group of upto Rs. 25000.
- ❖ With regard to factors influencing marine and inland fish, the delicious factor of fish was ranked first by the consumers with a mean Garrett's score of 69.80.
- ❖ With regard to frequency of purchase, majority (47 %) of the consumers purchased fish on a monthly basis.

- ❖ Majority (47 %) of the consumers purchased upto 1.50 kgs of fish per transaction.
- ❖ With regard to the amount paid per purchase of fish, it was found that majority (55 %) of the respondents incurred expenditure upto Rs. 750 per transaction.
- ❖ Majority (72 %) of the consumers preferred marine fish to inland fish.
- ❖ Among the fish species, Rohu was found to be the most preferred species (64 %) for consumption.
- ❖ With regard to the place of consumption of fish, majority (64 %) of the respondents consumed fish both at home and outside (restaurants and functions).
- ❖ In majority (39 %) of the families, the family head was the decision-maker with respect to purchase of fish.
- ❖ Majority (61 %) of the consumers purchased fish from local vendors.
- ❖ For majority (88 %) of the consumers, the preferred species of fish was available in the market at the time of purchase.
- ❖ The unhygienic condition in shops was the major problem faced as opined by majority (45 %) of the consumers.
- ❖ About 67 per cent of consumers opined that the price of fish is expensive.
- ❖ Majority (72 %) of the consumers opined that they were satisfied with the quality of fish they purchased.
- ❖ Among the various factors promoting increased consumption of fish, reasonable price was the most important factor with mean Garrett's score of 64.47.
- ❖ Majority (50 %) of the retailers procured marine fish from Mangalore.
- ❖ With respect to inland fish procurement, majority (50 %) of the retailers found it convenient to procure from nearby lakes.

- ❖ Majority (45 %) of the retailers preserved the unsold fish for next day sales as this is quite common among most retailers.

### **6.3 Recommendations**

The recommendations emanating from the present study are as follows.

- ❖ The nutritional information about fish and the proximal availability of fish were found to promote increased fish consumption among consumers. Hence, the Karnataka Fisheries Development Corporation Limited may take up initiatives so as to make available nutritional information about fish to consumers, through print and electronic media. The Corporation may also explore the feasibility of establishing additional fish retail outlets in the city.
- ❖ Unhygienic condition in shops was the major problem for majority (45.45 %) of the consumers. Hence, adequate awareness may be created among fish retailers about the importance of hygienic conditions in their premises.

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