International Journal of Fisheries and Aquatic Studies 2015; 2(4): 233-238

ISSN: 2347-5129
IJFAS 2015; 2(4): 233-238

www.fisheriesjournal.com
Received: 05-01-2015
Accepted: 10-02-2015

B.S. Viswanatha
Ph.D. Scholar (ICAR-SRF)
Department of Fisheries Economics, Fisheries College and Research Institute, Tamil Nadu Fisheries University (TNFU)
Tuticorin--628008, Tamil Nadu, India

R. Senthiladeban
Director i/c Staff Training Institute, Chennai, Madhavaram Milk Colony, Tamil Nadu Fisheries University (TNFU),
Tamil Nadu, India

M. Rajakumar
Professor and Head
Department of Fisheries Economics, Fisheries College and Research Institute, Tamil Nadu Fisheries University (TNFU)
Tuticorin--628008, Tamil Nadu, India

J. Amali Infantina
Ph.D. Scholar
Department of Fisheries Economics, Fisheries College and Research Institute, Tamil Nadu Fisheries University (TNFU)
Tuticorin--628008, Tamil Nadu, India

Correspondence
B.S. Viswanatha
Ph.D. Scholar (ICAR-SRF)
Department of Fisheries Economics, Fisheries College and Research Institute, Tamil Nadu Fisheries University (TNFU)
Tuticorin--628008, Tamil Nadu, India

An overview of marine fisheries infrastructure and fish utilization pattern in Karnataka, India

B.S. Viswanatha, R. Senthiladeban, M. Rajakumar, J. Amali Infantina

Abstract
The paper examines the status of marine fisheries infrastructure and changes in the marine fish utilization patterns in the state of Karnataka. Major chunk of the marine fish production of Karnataka has been reported from the major fishing harbours and hence both State and Central governments give due importance for the development of infrastructure in the foresaid major fishing harbours. The study has been reliant on Secondary data and the same has been considered and analyzed by using percentage analysis and graphical method. The marine fisheries sector in the state has experienced remarkable developments in terms of infrastructure and marine fish utilization patterns. The results reveals that the progress of fresh fish marketing, freezing facilities and canning industry with chief emphasis on cold chain management in marine fisheries sector; so as to enable the fishers to harvest fishery resources in an efficient and sustainable manner and to meet the inimitable consumer needs.

Keywords: Fisheries infrastructure, Fish utilization, Fishing harbours, Cold chain management,

1. Introduction
Karnataka emerged as a maritime state in 1956 and established its independent Department of Fisheries in 1957. Since then, the Department of Fisheries has been consistently striving hard for the overall development of fisheries and fishermen by implementing several development schemes both in marine and inland sectors. The state has 300 km of coastline and 27,000 sq km continental shelf area, rich in pelagic fishery resources. Traditionally Karnataka coast is known as “mackerel coast”. The marine fisheries resource potential of the state has been estimated at 4.25 lakh metric tons, of which 2.25 lakh metric tons come from inshore areas up to a depth of 70 m and the remaining 2.0 lakh metric tons hail from off shore/deep sea zone [7]. To harvest the marine fisheries potential in an efficient and sustainable way there is a need for landing and berthing facilities for promoting the UN intermittent operation of fishing vessels. These are met by constructing fishery harbors with adequate supplementary facilities like freshwater, auction halls, ice plants, chilled storages, workshops, repair facilities, slipways and net mending sheds. Over the years, the state government has invested in creating port facilities, transport and communication, supply of ice and storage facilities both under State plan expenditure, through National Co-operative Development Corporation (NCDC) schemes and centrally sponsored schemes [2]. The state has 6 major fishery harbors such as Mangalore fishing harbor in Dakshina Kannada (D.K), Malpe and Gangolli fishing harbors in Udupi and Honavar, Tadri, and Karwar in Uttara Kannada (U.K) districts. About 90% of the marine fish production in the state comes from these major ports.

There are also minor fishing ports providing landing facilities to the small boats and traditional crafts. Though these fishing ports are well connected to the roadways, some of the basic amenities such as toilet, retiring room, potable water supply, and sanitation are found to be lacking. Most of the ports have failed to provide berthing place for increased number of fishing crafts. Malpe and Honnavar are the first fishing harbours, constructed with central government assistance of ₹ 4.26 crore and ₹ 0.459 crore respectively [1]. The highly perishable nature of fish, bulk production, diversity of production and consumption of fish commands ample facilities for processing and marketing. The infrastructure for handling and processing of marine fish in India includes freezing plants, canning plants, ice plants, fish meal plants, pre-processing centers and cold storage. The present study examines an overview of marine fisheries infrastructure and fish utilization pattern in Karnataka.

2. Materials and methods

The profile of major fishing harbors, fisheries infrastructure and marine fish utilization pattern in Karnataka during 1980-2009 have been used in the present paper. The secondary data has been collected from Department of Fisheries, Government of Karnataka and relevant research articles. The changes in the fish utilisation pattern have been studied using graphical method and percentage methods.

3. Results and Discussion

3.1. Marine Fisheries Infrastructure in Karnataka

The profile of six major fishing harbors includes length, berthing capacity and availability of public utility services within the port. In addition, availability of allied services such as workshop, ice plants and cold storage, marketing yards were also documented. Based on the available information, we can conclude that Malpe has highest facilities and the largest in size followed by Mangalore and Tadri. However, in terms of production Mangalore is the highest indicating the preference of fishing units to land their catches at Mangalore port as attracted by higher prices and appropriate marketing arrangements. Infrastructure such as ice plants, cold storage, canning plants, fish meal plants has been installed with proper approach roads, transport trucks, insulated vans and marketing facilities. In order to preserve the freshness of fish, the government has encouraged investments through its policy of providing infrastructure loan at concessional interest rates and subsidies since 1980s. The commissioning of Mangalore ice-cum-freezing plant, with a capacity of 5 tons/day, one cold storage of 68 tons and a frozen storage of 80 tons at Mangalore in the early fifties, increased the level of consumption of fish in the fresh form (Table 1). However, the increased landings of shrimp, fin fish, cuttlefish, and squid enabled their freezing mainly for export to the European Union. This gave a spurt to processing activity which resulted in the establishment of about 31 freezing units in Karnataka [11].

Canning enterprises were started in Karnataka during the late 1960s. During the following decade, 1970-72, there were 13 canning companies with varying production capacity of 500 to 25,000 cans per day, in the undivided D.K. district [12]. The demand for canned fish arises mostly from the defense services and from North Eastern States. The main importers of canned products are countries of Europe and America. Tuna, mackerel and oil sardine are the three major species, used for canning in Karnataka. Due to the growing demand for frozen products coupled with high cost of tin containers, the canning sector suffered a setback in the export field by the middle of 1970. During the period 1990-98, though the number of canning units in coastal Karnataka decreased from 10 to 8 units, the annual capacity increased from 320 tons to 528 tons [7]. The number of ice plants increased from 50 to 187 during 1970-2009 and the ton capacity per day has increased over 6 times during the same period. During the corresponding period, the installed capacity of cold storages increased from 874 metric ton per day to 2055 metric ton per day. The number of fish meal factories increased from 4 to 20 during 1977-2009 (Table 2). With the objective of an integrated marine fisheries development, Government of Karnataka established KFDC during 1971. The corporation resulted in a huge revolutionary change in fish marketing by establishing cold chain system to supply fresh and iced fish to interior rural markets, and through refrigerated trucks and cold storages to the farther and interior urban markets. The system, which covered four districts of the state was a landmark development in freezing technology [10].

Table 1: Profile of major fishing harbors of Karnataka

Particulars	Major fishing harbors					
	Mangalore	**Malpe**	**Honnavar**	**Tadri**	**Karwar**	**Gangolli**
Year of commencement i. First stage	1984-85	1975-76	1973-74	1982-83	1966-63	2001-02
ii. Second stage	2000-01	1996-97	-	1993-94	-	-
Length of quay	183 m	658m	200m	250m	160m	54m
Berthing capacity(no. of boats)	230	279	40	50	33	40
Marine Fisheries Infrastructure						
No. of auction halls	2	3	2	1.	2	2
Length of auction halls (sq.m)	675	4500	2760	1400	260.	1680
Jetties	A	A	A	A	A	A
Road	A	A	A	A	A	A
Freshwater supply	A	A	A	A	A	NA
Drainage	A	X	A	A	A	NA
Electricity	A	A	A	A	A	A
Toilet	A	A	A	A	A	A
Parking	A	A	A	A	A	A
Boat building yard (no.)	11	11	4	2	5	12
Mechanical workshop	A	A	NA	A	A	A
Slipway	NA	A	NA	NA	A	NA
Community hall	NA	NA	NA	A	NA	NA
Diesel bunk(no.)	5	6	2	3	2	3
Ice plants(no.)	5	7	2	2	1	1
Cold storage and freezing plant	NA	NA	NA	1	1	NA
Satellite communication	A	A	A	A	A	NA
Fish markets and handling sheds	NA	NA	A	X	NA	NA
Fish gear shed	NA	A	NA	A	NA	A
Dry fishing yard	NA	A	A	A	A	A
Fish marketing co-operatives (nos.)	5	6	2	2	2	3
Cumulative public investments (₹ in lakh)	290.14	2725.34	120.98	1505.68	162.10	902.36

Source: [2] [3] [6] [7] [9] Note: A = Available, NA = Not available

Table 2: Fish processing infrastructure in Karnataka

Details	1970		1977		1987		1997		2008-09	
	No.	Capacity (tons/day)	No.	Capacity (tons/day)	No.	Capacity (tons/day)	No.	Capacity (tons/day)	No.	Capacity (tons/day)
Ice plants	50	418	90	781	136	1518	125	1822	187	2806.5
Cold storage	NA	874	20	797	46	1630	39	2567	27	2055.5
Freezing plants	15	70	25	117.5	25	116.5	22	136	13	79.5
Frozen storage	NA	NA	25	236.1	25	2900	20	2740	11	1653
Canning plants	13	NA	12	NA	7	24.5	7	526	8	527.5
Fish meal plant	NA	NA	4	NA	10	129.5	18	184	20	414.5
No. of fish markets	NA	-	NA	-	NA	-	158	-	218	-

Source: [2] [3] [6] [7] NA =Not available

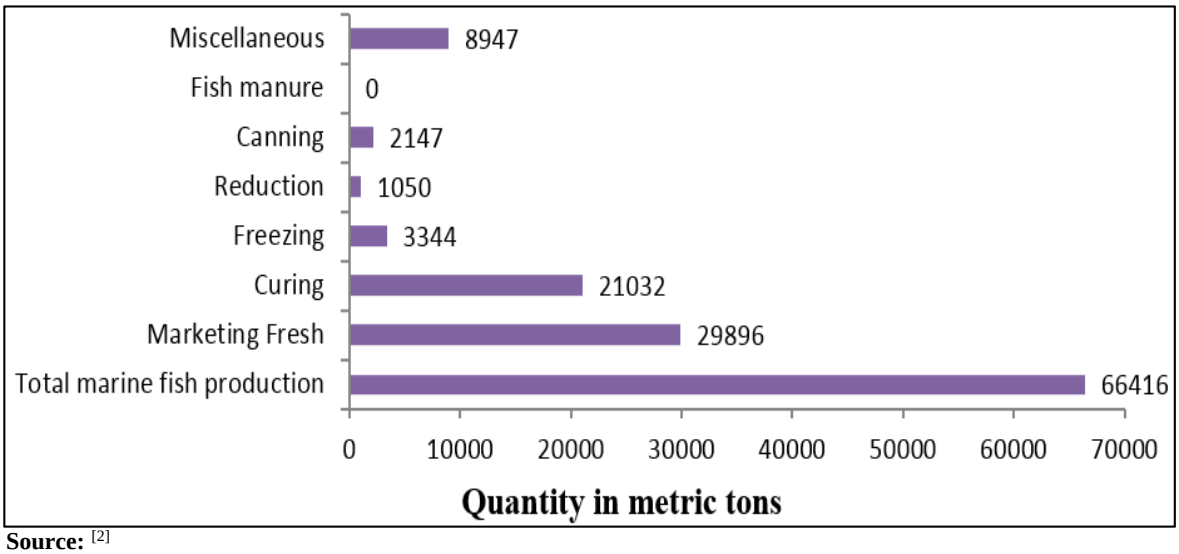
Table 3: Marine fisheries infrastructure in Karnataka

Particulars	1977		1988-89		1996-97		2008-09	
	No.	Capacity (metric tons/day)	No.	Capacity (metric tons/day)	No.	Capacity (metric tons/day)	No.	Capacity (metric tons/day)
Ice Plants								
D.K.	NA	-	-	-	38	475	63	933
Udupi	-	-	-	-	53	731	69	1152
Uttara kannada	NA	-	-	-	34	616	55	721.5
Total	90	781	93	1191	125	1822	187	2806.5
Cold Storage								
D.K.	-	-	-	-	20	653	10	357
Udupi	-	-	-	-	9	886	8	1056
Uttara kannada	-	-	-	-	10	1028	9	642.50
Total	20	797	29	1183	39	2567	27	2055.5
Freezing Plants								
D.K.	-	-	-	-	11	58	3	19
Udupi	-	-	-	-	5	39	5	28
Uttara kannada	-	-	-	-	6	39	5	32.5
Total	25	117.5	20	123	22	136	13	79.5
Frozen Storage								
D.K.	-	-	-	-	10	1090	2	178
Udupi	-	-	-	-	4	625	4	725
Uttara kannada	-	-	-	-	6	1025	5	750
Total	25	236.1	17	2054	20	2740	11	1653
Canning Plants								
D.K.	12	NA	7	24.5	-	-	-	-
Udupi	-	-	-	-	6	524	7	526
Uttara kannada	-	-	-	-	1	2	1	1.5
Total	12		7	245	7	526	8	527.5
Fish meal Plant								
D.K.	-	-	-	-	10	71	14	291.5
Udupi	-	-	-	-	6	73	5	83
Uttara kannada	-	-	-	-	2	40	1	40
Total	4		1	129.5	18	184	20	414.5

Source: [2] [3] [6] [7] Note: X=Not Available

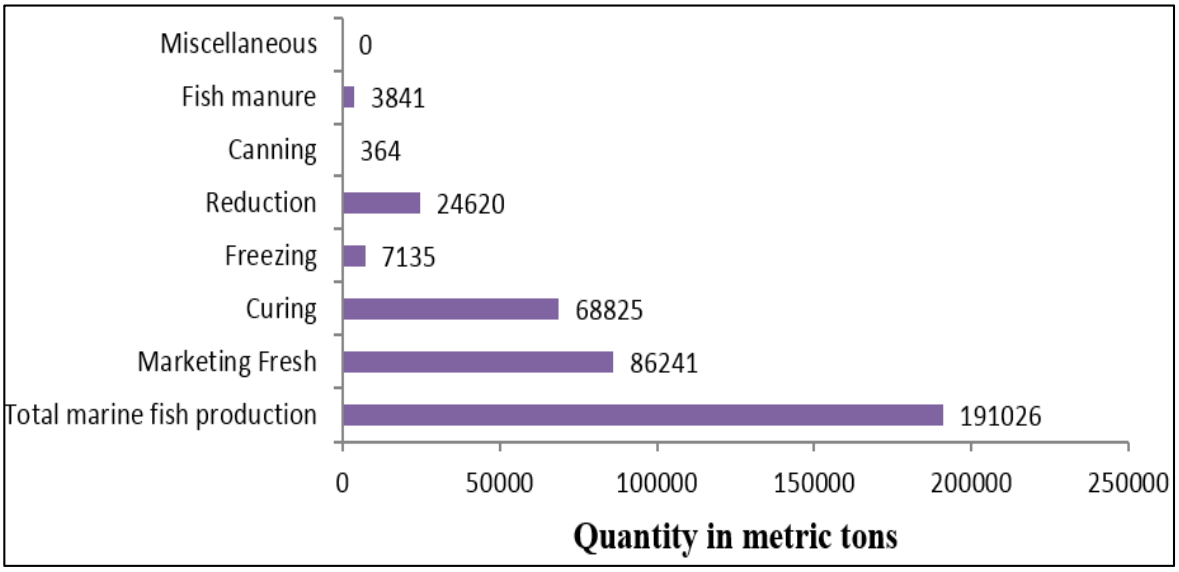
3.2. Fish Utilization Pattern in Karnataka

The changes in the fish utilization pattern during 1970-2009 are showed in fig.1 to fig. 5. The fisheries infrastructure development supplemented by changing preferences led to a change in the utilization pattern of fish. The proportion of the total marine fish production utilization in the fresh form has increased from 29896 tons (45%) to 84305 tons (68%) during 1970-2009 which indicates the improvement of cold chain infrastructure for marine fish in the state. At the same time there has been a sweeping decrease in the percentage of cured fish from 21032 tons (32%) to 13650 (11%), indicating that fish which used to be traditionally cured and dried, have been utilized in fresh form. During the same period, the total marine fish disposed to freezing plants has increased from 3344 tons (5%) to 12708 tons (10%) which shows the rise in the number of freezing plants in the state. Also, the disposal of total marine fish to canning industries has significantly improved from 2147 tons (3.23%) to 8864 tons (7.15%) during 1970-2009 respectively. The disposal of total marine fish to fish meal production was completely nil during 1970 whereas about 3719 tons have been processed by fish meal plants during 2009. The shared allocation towards reduction and miscellaneous purposes has also reduced.



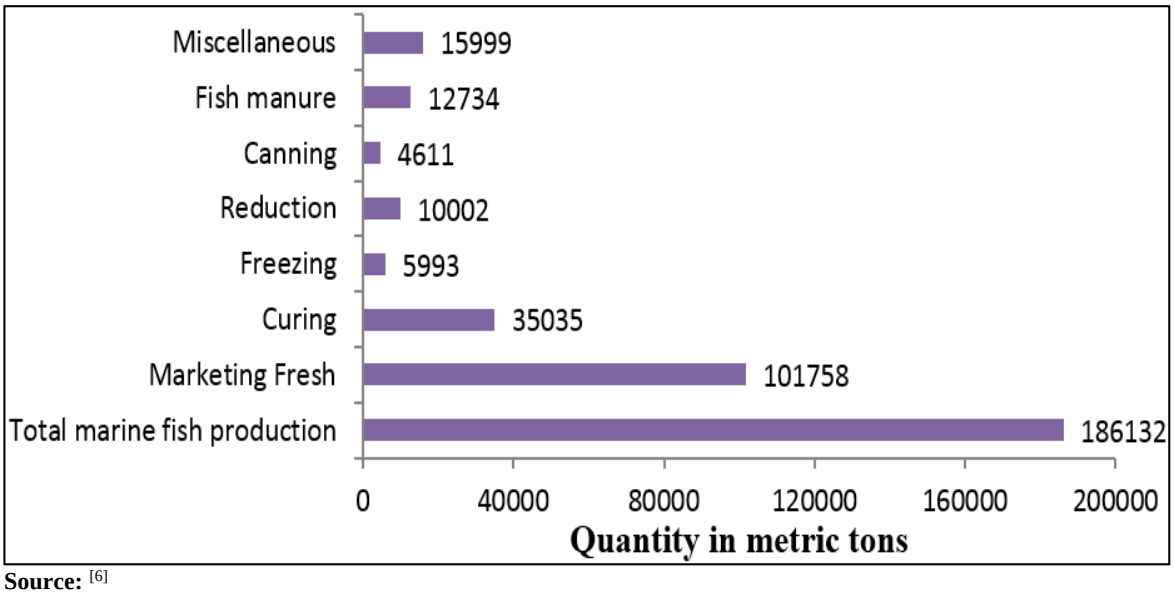
Source: [2]

Fig. 1: Fish utilisation pattern in Karnataka during 1970



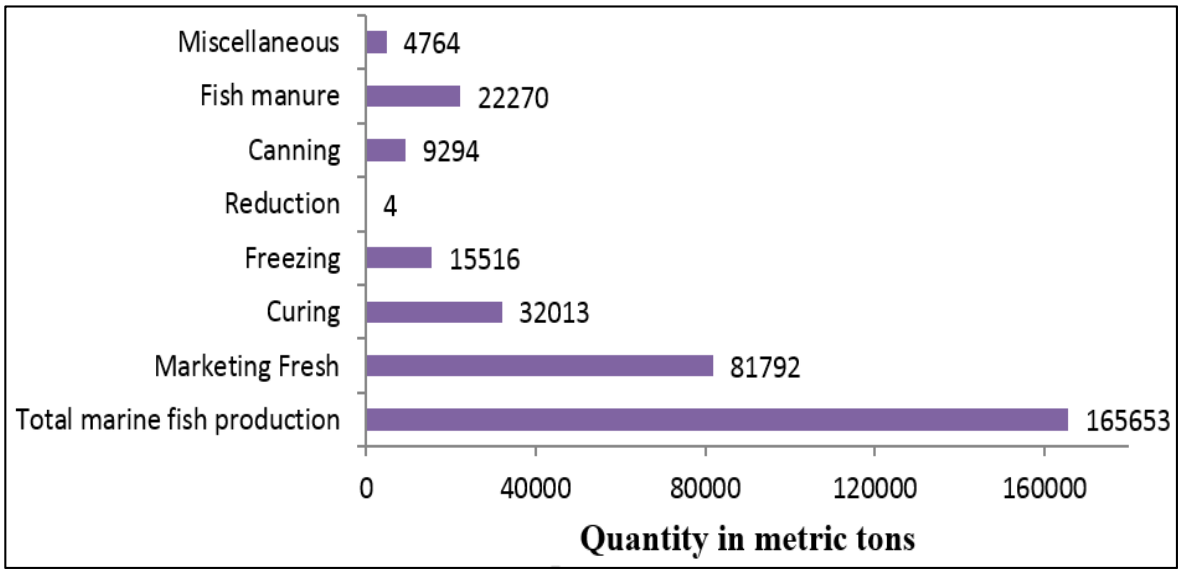
Source: [3]

Fig. 2: Fish utilisation pattern in Karnataka during 1980



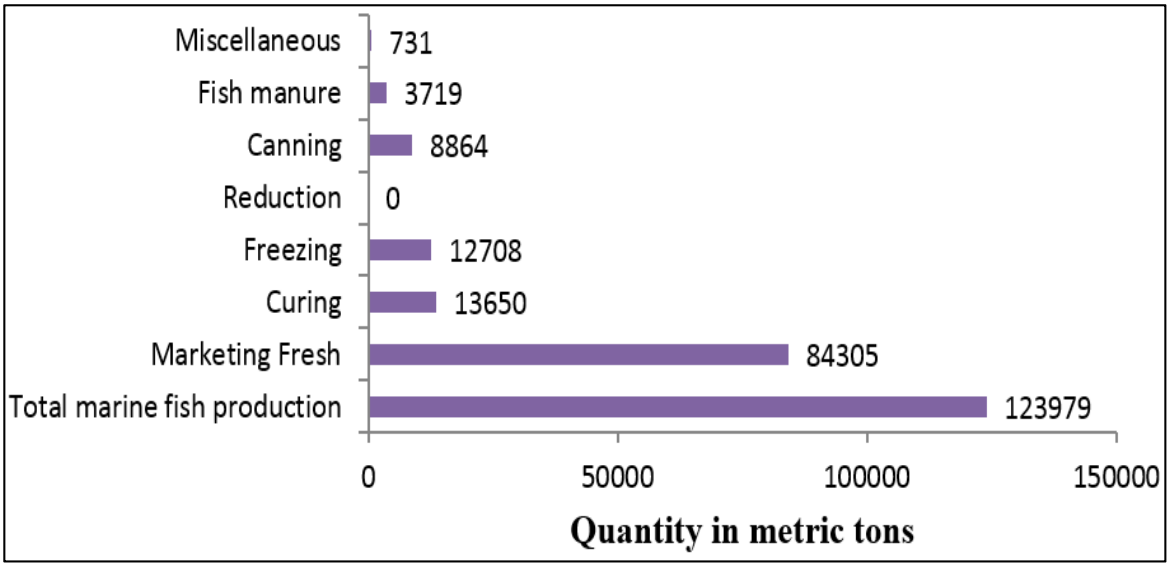
Source: [6]

Fig. 3: Fish utilisation pattern in Karnataka during 1990



Source: [7]

Fig. 4: Fish utilisation pattern in Karnataka during 2000



Source: [8]

Fig. 5: Fish utilisation pattern in Karnataka during 2009

4. Conclusion

The marine fisheries sector infrastructure development and increased fishing capacity of fishers has enabled them to harvest and thereby access fresh fish throughout the year thus reducing the demand for dry fish. Non availability of sufficient quantity of marine fresh fish and increased prices has been attributed due to the stiff competition from fish meal plant and fish oil companies, discouraging the petty processors from continuing the fish drying activity. The marine fish utilization pattern presents a trend which is different from that of other developed countries witnessing distinct needs of fish consumers. Thus, improvement in cold chain infrastructure, road transport etc. have encouraged traders to develop marine fish supply chain system enabling regular supplies. Conversely, the share of cured/dried fishes has declined substantially. The encouragement given to fish export is apparent from the increased share of frozen fish.

5. Acknowledgements

The study is a part of Ph.D. dissertation entitled *"Supply Chain Analysis of Marine Fishes in Karnataka, India"*, study carried out by first author, Fisheries College and Research Institute, Tamil Nadu Fisheries University, Tamil Nadu.

6. Reference

1. Anonymous. Study report on marketing and infrastructure framework for the development of fishing industry in Karnataka State. Manipal, Karnataka: Syndicate Bank Project Monitoring and Evaluation Cell, 1979.
2. Bhatta R, Sagarad G. An economic analysis of fish processing industries in Karnataka (Unpublished). Mangalore: Department of Fisheries Economics, UAS, College of Fisheries, 1999.
3. GOK. Statistical bulletin of fisheries. Bangalore: Directorate of fisheries, 1977.
4. GOK. Statistical bulletin of fisheries. Bangalore: Directorate of fisheries, 1987.
5. GOK. Statistical bulletin of fisheries. Bangalore: Directorate of Fisheries, 1995.
6. GOK. Statistical bulletin of fisheries. Bangalore: Directorate of fisheries, 1997.
7. GOK. Statistical bulletin of fisheries. Bangalore:

Directorate of fisheries, 2009.
8. GOK. Karnataka at a glance. Bangalore: Directorate of Economics and Statistics, 2010.
9. Mohamed KS, Muthiah C, Zacharia PU, Sukumaran KK, Rohit P, Krishanakumar PK. Marine fisheries of Karnataka State, India. Naga 1998; 21:10-15.
10. Moorjani MN. Fish Processing in India. New Delhi: Indian Council of Agricultural Research 1984.
11. Ramalingam V. Promotion of seafood export from India with special reference to Karnataka's resources- A projection for the seventh plan period. In I. Karunasagar and N. V. Sripathy (Eds.), Problems and prospects of marine fishing and fish processing in Karnataka Mangalore: Forum for Fishery Professionals 1986; 126-131.
12. Sripathy NV. Fishery by-products industries in Karnataka. In I. Karunasagar and N. V. Sripathy (Eds.), Problems and prospects of marine fishing and fish processing in Karnataka. Mangalore: Forum for Fishery Professionals.1986; 132-135.