Fisheries sector occupies a very important place in the socio-economic development of the country, as it contributes to economic growth and human welfare. It has been recognised as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries. The fisheries sector contributes to the livelihood of a large section of economically underprivileged population in our country (Ayyapan and Krishanan, 2004). According to NCAEPR (2008) about 14 million people are employed in this sector either directly or indirectly.

Fisheries is a sunrise sector in India, has recorded faster growth than that of crop and livestock sectors (Kumar et al., 2006) with diverse resources. During the year 2004-05 and 2010-11 the fish production growth rate was recorded between 3% and 4% (www.articles.timesofindia.indiatimes.com). Fisheries sector contributes to 1.4% of total national GDP (www.icargoa.res.in). The country has shown continuous and sustained increments in fish production since independence.

Fish production plays an important role in socio-economic status of fisherfolks (NFPDB, 2011). The demand for the fish and processed fish food is increasing very rapidly in the world having high nutritive value. Due to steep increase in population and occupying more land for housing and industries, the agriculture land is decreased and population is not able to meet the adequate nutritive value. According to Yadav (1997) fish is a rich source of protein, carbohydrate and vitamins (A, D and E), iron,
calcium and other minerals for human diet. It represents 14.6% of all animal protein on global basis (Eyo, 2001; Abolagba and Melle, 2008). The biological value of fish protein is very high because of its high digestibility up to 90 - 96%. It also contains larger amount of lysine and methionine, the two amino acids which are deficient mainly in cereal diets. Besides using fish as a food, their by-products like oil, glue, isinglass, gelatin, etc. are also very important. Fish being an important commodity among aquatic organisms, ensures food and nutritional security (Randhir, 1984). It also adds to the foreign exchange earning of the country by selling fish and fish products in international markets (Kumar, 2004). According to Alam et al. (2010) fish marketing has a momentous role in fishery trade.

Fish market is a place where the fishes and fish products of commercial importance are subjected to sale. Regulation of fish production and consumption through sale is known as fish marketing (Shammi and Bhatnagar, 2002). Biswas (2006) reported that demand and consumption patterns of fish are determined by geography, feeding habits of the locality, traditional and nutritional standards. Demand of fish may be either domestic or for export purpose. The domestic demand depends on human and industrial consumptions. Human consumption varies areawise, incomewise and regionwise while industrial consumption depends on regional variation, quantity, variety and season. The potential
demand of fish in the markets changes according to the taste and needs of consumers. Therefore, traders have to take care of maximum production, best possible quality, brand name, pricing the product of their timely supply to consumers to get better result on investments.

The supply of highly perishable commodity depends on utilization pattern in respect of wholesale and retail infrastructural facilities of landing and consumer centers. The retailing infrastructure consists of weighing, grading, peeling and packing facilities. The location of markets and transportation also influence the supply and marketing of the commodity.

Market infrastructure includes wholesale market, retail market and fish retail outlets. In wholesale markets, large quantity of fishes are collected from the surrounding places sold to other wholesalers and retailers whereas in retail markets, fishes are sold to consumers or to agents (www.bieap.gov.in). The third type of marketing is the retail outlets where the fish shops are operated by Government bodies or private individuals (Kumar et al., 2008). The retail outlets purchase fish directly from fishermen and sell to consumers. Olubunmi and Bankole (2012) reported that marketing and fish distribution is done through various channels which are important characteristics in the process of getting products from source to consumers and known as marketing channels.
1.1 Marketing Channels

Marketing channels are the sequence of intermediaries through which fish passes from producers to consumers (www.bfrf.org). Olukosi and Isitor (1990) categorized marketing channels into centralized and decentralized channels. Centralized channels deals with agents who serve as middleman between producer and consumer while decentralized is a kind of channel where both consumers and agents can buy fish directly from the producers (Madugu and Edward, 2011). The intermediaries of marketing channels are involved in providing services of processing, preservation, packing, transporting and result in cost addition at every stage of marketing (Bishnoi, 2005). The intermediary channels in fish marketing are producer, commission agent, auctioneer, wholesaler, retailer, vendor and consumer.

1.1.1 Producer

Producer includes the fishers, aquaculturists or entrepreneurs who are primary suppliers of the fish to the market channels (NCAEPR, 2008). Some fishers have their own boats while others work as fishing laboures under the boat owners and give some percentage of profit to the boat owners. Thus these owners can be treated as the primary fish suppliers. Some fishers and aquaculturists are directly connected to the
markets whereas others sell their products to consumers through middlemen.

1.1.2 Commission Agent

The commission agent gets the fishes from the fishermen and sell the same to the retailers, processing plants and export companies. Commission agent generally pays advance to the fishermen who in turn sell the fishes to him.

1.1.3 Auctioneer

The auctioneer is the third intermediary in marine and freshwater marketing channel. The fishermen bring their catch to auctioneers who auction the fish at the landing centre. Auctioneers take commission from the fishermen.

1.1.4 Wholesaler

The wholesaler buys fish in bulk from auctioneers and sell it to retailers or other traders. Some value addition is carried out by the wholesalers in term of sorting, grading, cleaning, icing and packing fish before the sale. Wholesalers usually know the demand of species and average trend of daily fish catches at the landing centres (Bishnoi, 2005). Wholesaler acts as a commission agent to whom the fishermen sell their
products and keep higher margin as compared to auctioneers assuming the risk of sale and cost of ice during transportation (Kumar et al., 2008).

1.1.5 Retailer

The retailer sells fish directly to the consumers. Maximum value addition to fish is done through retailers. The retailers grade, clean, pack and display the fish for the consumers. They mainly buy the fish from the wholesaler but in several cases, groups of retailers participate in auction process for buying fish directly from auctioneer. Retailers keep a marketing margin which shows lot of variations across the country.

1.1.6 Vendor

Vendor sells fish directly at the consumer doorstep. Most of the fish vendors in India are women. Some mobile vendors move around on vehicles primarily involve men. These vendors purchase fish from landing centers or wholesale markets. Many vendors supply the fish directly to hotels and restaurants which ensures daily sale and income.

1.1.7 Consumer

Consumer is the last intermediary channel of fish marketing. Consumer gets fishes from fish markets, retail outlets or vendors.
1.2 Functions of Fish Markets

Main functions of the fish markets are to collect the fishes from producers, middlemen or private traders to sell them to consumers in fresh and good condition. It also explore the possibilities for export and import for foreign exchange and cooperate in international trade.

1.3 Global Scenario of Fish Markets

In last three decades production and consumption of fishes have risen to large extent (www.ifpri.org). Countries with rapid population growth, income growth and urbanization are responsible for higher rate of fish consumption. The international trade in fish and fishery products has been growing steadily. Total fish production of world is recorded as 1540 lakh ton during the year 2011 (www.fao.org). The growing demand of fishery products across the world during the recent years is attributed to change in dietary habits towards fish due to its nutritive value. Moreover the establishment of a number of processing industries in China, Thailand and Vietnam also resulted in boosting up of fishery trade in processed form. In Chinese seafood trade, shark fish and whole frozen fish have been important import commodities from all over the world. The main fish and fish products importing countries are Russia, USA, Norway,
Canada and India. China exports white fish fillets, salted and smoked fish to Germany, Spain, France and UK. On the other hand, United States and Europe have largest fish import markets in the world. It is well known that they have established import markets for canned fish, frozen fish and fish meals rather than fresh fish (http://organostate.edu). Currently, number of companies in the United States, Canada, Europe and Asia are involved in converting fish and shell fish waste into marketable products. European countries provide good hygiene practice, cold storage rooms, adequate lavatories and hand washing facilities with air conditioned markets (http://ec.europa.eu) while Turkish wholesale fish markets do not maintain the hygienic conditions (Mol and Saglam, 2004). Tsukiji fish market of Tokyo is the biggest wholesale fish and seafood market of the world (www.wageningnur.nl). This fish market has cold storage room, non slippery floor, continous temperature control and adequate light facilities. The world market for seafood has been doubled within the last decade reaching US $49.32 billion. India’s share is only 2.4% mainly due to shrimp as a product (NFPDB, 2011). Fish trade is a significant contribution in foreign currency earnings. Profit depends on demand of exportable fish in the world market. Though marketing profits are very high but fishermen receive meagre amount of total final profit.
1.4 National Scenario of Fish Markets

India is the third largest producer of fish and second largest producer of freshwater fish in the world (www.fao.org). The 8118 km coastline, 52.66 lakh ha of reservoir, tanks and ponds, 14.37 lakh ha of brackish water and 2.02 million sq. km. of EEZ (Exclusive economic zone) are India’s vast potential resources for fish production which is recorded as 82 lakh ton during the year 2011. According to GFS (2011) the fish and fishery products exported from India are contributed from Inland (49.34 lakh ton) as well as marine water (32.17 lakh ton). Gupta and Gupta (2006) reported that India exports shrimp, crab, squid, pomfret, tuna etc. to more than 60 countries including UK, Italy, Spain, France, Israel, Australia and Russia. USA is second largest market for marine products imported from India (NFPDB, 2011). India also exports fish products to South East Asia. On the other hand, she imports chilled fish and feed from Bangladesh, Japan, Pakistan, USA, China and Thailand. Though, India imports and exports fish and fish products to many countries of the world, the fish markets are highly unorganized as handled by middlemen and private traders (Mugaonkar et al., 2011). Bryceson (1993) reported that role of middlemen in marketing is being accused by earning higher profits. Prices of fish becomes higher thereby reducing fishermen’s share (Olalusi et al., 2010). Sakhare (2007) reported
that sufficient storage and transport facilities are not available in India though the private trade dominates the market (NCAEPR, 2008).

1.5 State Level Scenario of Fish Market

According to GFS (2011) the major states of India for Inland fish production and marketing are West Bengal, Andhra Pradesh, Uttar Pradesh, Bihar and Orissa. Similarly the states of Gujarat, Kerala, Maharashtra, Tamilnadu and Andhra Pradesh are known for marine fish production and marketing. Kerala and Karnataka are identified as the hubs for capture fisheries export. Andhra Pradesh, Tamilnadu and West Bengal are known for cultured shrimp export to Japan, Europe and USA.

Gujarat has 1600 km coastline constituting 20% of Indian coastline. Reservoir, tanks and ponds covers 3.82 lakh ha and brackish water area of 3.76 lakh ha. Gujarat is predominant exporter of farmed shrimp from aquaculture ponds alongwith wild catch, oceanic shrimp exports to South East Asia. It also exports squid and cuttle fish to Europe and frozen fish to Hongkong, China, Singapore, Thailand, Malaysia, Vietnam, Bangladesh and Philippines (www.hindubusinessline.in). Fish production of Gujarat was recorded as 7.75 lakh ton during the year 2011 while 1.67 lakh ton was recorded only from South Gujarat in the same year (GFS, 2011).
South Gujarat contributing 22% of total Gujarat’s fish production (GFS, 2011) has lots of potential in fisheries but compared to achievements in fish production, fish marketing system is very poor and highly inefficient (Kumar et al., 2008). Traders sell their fish without proper storage facilities. Most of retailers sell their fishes on road without maintaining the quality and hygiene. Facilities and infrastructure in all types of fish markets are far from satisfactory level. On the other hand, fishermen’s status is very poor due to exploitation by middlemen, lack of education, knowledge about latest technology, credit facilities and poverty. To promote the fish marketing, Department of fisheries work to enhance the quality of fish production with sustained conservation of resources as well as to improve the socio-economic standards of the fishermen. Additionally, State Fisheries Department offers various subsidies and assistance but fisherfolks are unable to avail the facilities due to unawareness.

The National Fisheries Development Board (NFDB), Hyderabad has allocated a grant of Rs. 1.39 crore to Surat Municipal Corporation (SMC) in year 2011 for the construction of a modern fish market at Nanpura area of Surat city (www.articles.timesofindia.indiatimes.com). To renovate Nanpura fish market, there was a need to broaden the roads near the market which would have affected the houses and local people of
the area opposed for construction. Still modern fish market had not been constructed in Surat city.

1.6 Role of Women in Fish Marketing

Women play important role in post harvest activities like processing, preservation and marketing (Alamu, 2000). The roles of women mainly in processing and marketing have been reported by Ajayi et al. (1989) and Clucas and Ward (1996). Ahmed et al. (2012) found that involvement of women in fisheries is no longer a rare scenario. They are generally engaged in making fishing nets, repair and maintenance of gears, fish processing, transportation and marketing. Fish marketing is mainly handled by women. Nwabueze (2010) and BOBP (1990) reported that various marketing activities in India are performed by women. Women can be auctioneers, retailers, trash fish vendors and even dealers for export. Women in Tamilnadu are engaged in seaweed collection, fish curing, marketing, net making and prawn seed collection. In Andhra Pradesh, the main occupation of women include collection of fish with curing, processing and marketing. Women in Maharashtra, also play a major role in fish marketing and control the entire fisheries economy around Mumbai while in Gujarat women mostly are involved in processing and fish marketing (http://eprints.anfri.org.in). Women’s involvement in fish marketing created self-employment opportunity for
women and helped to increase their family income thereby invigorated their socio-economic progress as well as the growth of fishery sector.

1.7 Fish Markets and Quality of Fish

Gupta (1984) and Shrivastava (1985) studied the marketing of fish and fishery products in India where they analyzed price variations among species across states. Distance of landing centres to market is one of the major reasons responsible for price variation. Fish catch is transported by means of vehicles. Fish gets easily spoiled due to long distance, inadequate storage facilities, improper handling and preservation. Thus quantity and quality of fish products face threat and may show variation in fish price (Dastagiri, 2003). Many market intermediaries are involved in marketing channels. There is a gap between the price consumer pays and farmer receives. Because of this, neither the fisherman receives remunerative price for his products nor the consumer can pay reasonable price (www.bieap.gov.in/capturefisheriesandpostharvesttechnology.pdf). Moreover fish seller pay informal taxes in order to continue vending the fish. They are constantly harassed and threatened with eviction by police and civic authorities (ICSF, 2010). Basic facilities for storing, processing and selling fish, clean toilets, access to potable running water and adequate waste disposal system are also not available. Such facilities are essential for the health and wellbeing of vendors and consumers.
In India, most of studies on fish markets and marketing have been conducted with reference to the unorganized retail markets. These information are restricted to gender, age and credit (Tietze, 2004), frozen fish retailing (Agbeja, 2004), marketing facilities, hygiene and sanitation (Bestari, 2004). Hygienic condition of fish is an essential criteria for consumer’s health because unhygienic conditions are the causes of many diseases (Mol and Saglam, 2004). According to Sallam (2007) fish is one of the most highly perishable food products. After death, fish remains in good quality only for a short period (Clucas and Ward, 1996). Saliu (2008) reported that fish spoilage is influenced to a large extent by high ambient temperature, considerable distances of landing ports to points of utilization and poor as well as inadequate infrastructure for post harvesting and distribution. Spoilage is caused by nonpathogenic and pathogenic organisms. Non-pathogenic microorganisms cause spoilage to fish but pathogenic microorganisms such as *Escherichia coli*, *Klebsiella pneumoniae*, *Vibrio cholerae*, *Pseudomonas aeruginosa* and *Salmonella typhi* cause food poisoning and severe diseases (Omojowo and Sogbesan, 2003). pH of fish flesh is about neutral which is a suitable living and proliferation place for bacteria (Colakoglu et al., 2006). Kadota (1990) reported that microflora of fish is closely connected to the microbes of water and sediment. According to Omojowo and Sogbesan (2003) fishes
of temperate environment carry a lower number of bacterial flora whereas fishes of tropical environments have slightly higher counts.

In polluted water high numbers of Enterobacteriaceae may be found. Enterobacteriaceae are a large, diverse, heterogeneous group rod shaped gram negative bacilli that survive under aerobic conditions. *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* were identified from external part of smoked fish while *Proteus sp.*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* were found from external part of fresh fish from fish market of Nigeria (Abolagba and Igbinevbo, 2010). Okonta and Ekelemu (2005) conducted a study on the microorganisms associated with smoked fish and reported *Escherichia coli* and *Staphylococeus aureus* as the predominant microorganisms infecting fish spoilage in Asaba area of Nigeria. According to Huss (1988) fishes carry pathogens such as *Salmonella sp.*, *Shigella sp.* and *Vibrio sp.* In clean temperate water, these microorganisms disappear rapidly, but it has been shown that *Escherichia coli* and *Salmonella sp.* can survive for very long periods in tropical water and once introduced may almost become indigenous to the environment (Fujioka et al., 1988). Both captured and cultured fishes carry loads of microflora which vary with geographical area, season and habitat of the fish. The method of harvesting could also increase the microbial load on the skin. Eyo (2001) reported that trawling with a net on the muddy seabed could increase the number of bacteria on
the skin of the fish as much as 100 times greater when fishes were freshly caught. The number of bacterial flora on the fish multiply considerably. Spoilage in fish from Awasa Lake of Ethiopia was reported by Mogessic et al., (1995) when fishes were exposed to temperature between 20-25°C for 3-5 hrs after the catch. Spoilage definitely reduces the fish quality and their market values. Eyo (1997) noted that spoiled fish were down graded and sold at a much lower price to be used essentially as fish meal in livestock feeds. Thus fishes fetch low price and affects the income of the fisherfolks.

1.8 Focus of Present Study

In India, study on fish marketing and fish quality have been conducted in Tamilnadu, Andhra Pradesh, Karnataka, Kerala, West Bengal and Maharashtra (NCAEPR, 2008). Gujarat has lots of potential for production, supply and export of fish and fishery products. Study on marine fish landing, fresh and dry fish marketing trend in different districts of Gujarat has been conducted (http://dc.icsf.net).

South Gujarat has 300 km coastline constituting 19% of Gujarat’s coastline. South Gujarat has lots of potential for fish production. Coastal belt of South Gujarat covers district Bharuch, Narmada, Tapi, Surat, Navsari and Valsad. Surat district has eight talukas viz., Choryasi, Olpad, Palsana, Bardoli, Mahuva, Valod, Songadh and Mandvi. Among these,
Choryasi taluka of Surat district is known for capture and culture fishing activities with wide distribution and marketing of inland and marine fishes. Since there was no systematic information available on fish marketing and its related issues subjected to fish quality and microbiological study, a detailed systematic study was planned to know the status of markets, status of respondents involved in fish marketing solely or with other fishing activities from choryasi taluka and Surat district. Attempts were also made to conduct the microbiological study to find out the edible quality of fishes sold in the study area.

1.9 Aims of the Study

Main aims of present work were to find out the status of fish markets of Choryasi taluka and Surat District along with the socio-economic and professional status of respondents engaged in fish marketing. Attempts were also made to check the hygienic condition of fish markets and the quality of fishes sold.

1.10 Rationale of Study

Present work would give current scenario of fish markets of Choryasi taluka and Surat district. Results obtained from present work would be helpful to Fisheries Department to develop strategies, policies
and plans for training and extension work in marketing. The result would also help to improve the status of fish marketing. This work would provide information to researchers, traders and fisherfolks regarding the status of fish markets to improve the quality of fish for better earning.

1.11 Limitations of the Study

Data collection was difficult many times due to unavailability of respondents during the study period. It was difficult to convince the respondents and gather information from them as some of them were not interested to disclose their business strategies and profit.