AN ANALYSIS OF THE POST TSUNAMI DOMESTIC FISH MARKETING AND CONSUMPTION TRENDS IN SRI LANKA

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ABSTRACT

Seafood is a staple for most Sri Lankans and the country is a net importer of seafood, because of the heavy consumption. Tsunami has had crippled the Sri Lanka's main protein supply system and thousands of others in marketing chain lost their jobs. The main focus of the study was to trace the impact of tsunami on domestic fish marketing and post tsunami fish consumption trends in Sri Lanka. Rapid Market Appraisal was carried out to obtain a cross-country comparative perspective on domestic marine fish marketing and mapping the supply chain. Rapid market appraisal was based on semi-structured interviews with key informants of the domestic fish marketing system and the field observations of knowledgeable observers. Three to five participants from each stage of fish marketing system were interviewed to obtain a reliable picture. Marine fish production (dropped by 76%) and fishing operations are long away from the pre-tsunami situation. Tsunami has had devastated the marine fish marketing infrastructure along the south and east coasts, including harbors, landing sites, auction halls, municipal fish markets, private fish stalls, trading vehicles, ice plants, cold storage facilities and processing plants. Tsunami's impact on domestic fish consumption led to trade losses and badly affect on the fish consumption in coastal villages than the cities where they have better consumption opportunities. The demand for dry fish and canned fish was increased but not for meat products.

Key words: tsunami, domestic fish market, fish consumption, rapid market appraisal

INTRODUCTION

From very ancient times, fish from the oceans and other aquatic sources have been an important source of food. Fish is highly perishable and at low levels of productivity there is need to barter or exchange the 'surplus' (Kurien, 2004). The compulsion to trade, even locally and domestically, is thus more innate to a fishery than to livestock or agriculture (Kurien, 2004). Methods of processing add to the shelf life of fish and make trade possible over greater time and distance (Kurien, 2004). A fishery sector's contribution to the country's Gross Domestic Product was 1.8% in 2004 and dropped by 36% after the tsunami (Central Bank of Sri Lanka, 2005). Sri Lankan consumers devote 11% total at home food expenditures to fish and fishery products, compared to 4% on meat. Fish is the cheapest and healthiest animal protein for the Sri Lankans. The total monthly per capita consumption of major animal proteins is 589.72 g. (meat, fish and eggs), of which, fish is the major source of animal proteins, accounting for 66% of all animal proteins consumed (Dept. of Census and Statistics, 2000). Marine fish is the most important category compared to inland fish, accounting for nearly 60% of all fish consumed (Amarasinghe, 2003). Tsunami has had devastated the Sri Lankan fishery sector, damaging 60% of the domestic fleet strength. The most affected areas, the north, east and southern coasts, produce nearly 73% of marine landings. A vast destruction to the domestic fishing fleet (about 16101 had destroyed and damaged) and loosing 10% of fishermen led to decrease the domestic fish supply (Ministry of Fisheries, 2005). Moreover, rumors of unsafe fish were decreased the demand for fresh fish temporally. The lack of demand has seen, fish prices plunge, dealing another blow to fishermen. The main aim of this study was to identify the impact of tsunami on domestic fish marketing and post tsunami fish consumption trends. This paper is consisting of three parts. Introductory part describes the consumption pattern, demand and supply for fish and fish marketing structure of the Sri Lanka. Body of the paper composed of methodology, results and discussions. The ending part brings the conclusions together with suggestions for future research.

CONCEPTS

The origins of Rapid Market Appraisal (RMA) are similar to Rapid Rural appraisal (RRA). Holtzman (2003) was used the sub-sector approach as the framework for analysis. RMA is a way to gain a good systems view of how a commodity sub sector is organized, operates and performs, identify sub sector constraints and opportunities, identify and diagnose policy and regulatory problems that require government and donor, analysis, attention and action and prescribe interventions in food system organization, technology and management (Holtzman, 2003). Rapid market apprasisal techniques mostly rely on semi-structured interviews with key informants, knowledgeable observers of a sub sector and a minimum number of participants at different stages of the commodity system (Kleih et al., 2003). Mapping commodity chains forms part of the set of 'informal' semi structured techniques used to identify participants of the sub sector, functioning, quantities and values involved technologies used, constraints and opportunities (Kleih et al., 2003).

METHODOLOGY

Markets for fish and fishery products operate at different scales of market space. Market networks at the national level in and around the capital city, Colombo, at the regional levels in Galle, Kandy and Anuradhapura, Kuranagalla, Ratnapura, Badulla, Jaffna, Trincomalee and sub regional markets of Negambo, Beruwella, Tangalle, Matara, Hambantota, and Dambulla were identified and investigated. In Sri Lanka the people along the coastal belt have greatest access to the regional and sub regional markets for marine fish products. In addition to marine fish, the markets for substitutes including fresh and processed inland fish, canned fish and dried fish were also investigated. Moreover, this study examined the landing / marketing centre located on the tsunami affected southern and eastern coastal belt of the country to assess the post-tsunami situation, damages to market infrastructure and consumption trends. Multiple data sources were used for the study. Numerous secondary sources were used to establish context, such as publications of Ministry of Fisheries and Aquatic resources, National Aquatic Resources Agency, National Aquaculture Development Authority, Hector Kobbekaduwa Agrarian Research and Training Institute and Department of Census and Statistics. Primary data sources included informal interviews, using interview schedule with producers at landing sites(or temporary camps in southern and eastern provinces), traders involved in marketing activities, middlemen traders, processing plant owners and workers, ancillary industries such as ice plants, transportation etc., and consumers in both coastal and inland areas and direct participant observation.

A range of different traders (assemblers, retailers and wholesalers) at different network levels were interviewed at their respective marketing points, usually within cities (Colombo, Galle and Kandy), towns (Negambo, Beruwella, Tangalle, Hambantota, Hikkaduwa), urban centers and villages. Retailers included foot cycle vendors, motor cycle venders, three wheel sellers, van sellers; private fish stall holders, municipal market stall holders and Ceylon Fisheries Cooperation (CFC) stalls. Mapping the supply chain for fish and fishery products forms part of the set of 'informal', semi-structured techniques used to identify participants of the sub-sector, its functioning, quantities and values involved, technologies used, constraints and opportunities. The drawing of supply chain by sub sector participants is accompanied by interviews aiming to obtain information on these key issues.

RESULTS AND DISCUSSION

Mapping the supply chain for both marine and inland fish and identify the impact of tsunami on domestic fish marketing with the post tsunami consumption trends were the main focuses. Two different market net works were identified for marine fish and inland fish. Where the marine fish marketing net work is well establish and expanded throughout the country.

Supply and Demand for the Fish in Pre Tsunami Period

The average per capita fish consumption is 17.2Kg/year (Ministry of Fisheries and Aquatic Resources, 2004). Fish consumption among Sri Lankans was higher compared to other south Asians, except Maldives. Figure 1 describes the total fish production of Sri Lanka with the per capita fish consumption. This reveals that average Sri Lankan is largely a fish eater than a meat eater (Amarasinghe, 2003). Fish assumes a significant importance in providing the people with a nutritionally balanced diet. Fish consumption in inland areas is lower (half the amount consumed in coastal areas) compared to coastal belt.
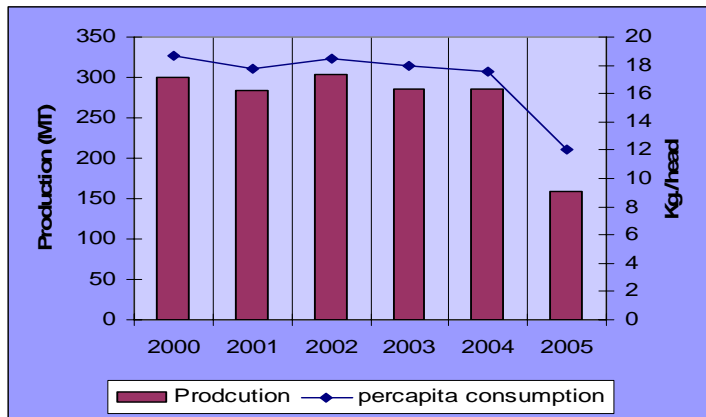
Figure 1. Total fish production of Sri Lanka and the per capita consumption
Source: Ministry of fisheries and Aquatic resources, 2000-2005.

The composition of the consumption basket was 54% of marine fish, 10% of freshwater fish, 31% of dry fish and 5% of canned fish (Ministry of Fisheries and Aquatic Resources, 2004). Dry fish and canned fish are popular among the country side. The most popular fish and consumed in fresh was tuna and herring.   Moreover dried form of skipjack and sprats are popular among low income, inland rural consumers. Sri Lankans prefer canned fish in brine other than in tomato sauce, ketchup or sauce. Fish and fishery products imports to Sri Lanka consisted of 30% of canned fish, 56% of dried fish and 14% of other forms (Amarasinghe, 2003). Local availability of dry fish has direct impact of market prices. Fish imports could influence local prices and consumption in two ways. First, increased fish imports could help to stabilize local fish prices and provide the domestic consumers with physical and economic access to fish and fishery products. Imports could also depress the prices of fish for local producers. Due to heavy consumption and production restrictions, Sri Lanka became heavy importer of dry fish. Figure 2 shows the trends of import and export of fish and fishery products in Sri Lanka. Dry fish and fishery products were the main fish imports of Sri Lanka (about 55%) (Amarasinghe, 2003). Time series analysis shows that the decreasing trend of fish imports to Sri Lanka. Especially, the ceasefire agreement between the government and terrorists were made peaceful environment and it helps to improve the fish production in north and east provinces. Increased fish production and processing in north and east made lower fish imports to the country.

Figure 2. Imports and Exports of fish and fishery products
Source: Ministry of Fisheries and Aquatic Resources, 2000-2005.

Domestic Fish Marketing in Pre-Tsunami Period

Disposition of fishery production consisted of 78% for marketing fresh, 19% for curing and 3% for freezing. Marine and inland are the two main subsections in domestic fish marketing in Sri Lanka. Marine fish landings account for 90% of the total fish landings of Sri Lanka (Ministry of Fisheries and Aquatic Resources, 2004). Marine fish landed at fishery harbors, anchorages and fish landing centers is

either transported to major urban centers or sold locally. The main components of domestic fish marketing system are central wholesale market at Colombo, regional whole sale markets in Kandy, Galle, Anuradhapura, Ratnapura, Jaffna, Trincomale, Badulla and Kurunegala (Municipal markets). Fish retailing is carried out by fish markets in urban centers, private sector owned fish stalls (280 stalls were identified before tsunami between Beruwala and Matara (Subasinghe, 2005)), venders using foot cycle, motor cycle, three wheeler and van. In the meantime super market chains are becoming popular retailing places in cities and urban centers. Domestic fish transportation is done in insulated or non insulated covered transport vehicles; fish is packed in rejiform, wooden and plastic boxes with ice.

Net work for Marine Fish Marketing

Marine fish producers can be divided into two main groups, such as subsistence fishers and commercial fishers. More than 50% of the fish catches are from subsistence fishers and the main portion of their catch goes for household consumption. Small portion of catch used for retailing and processing (drying and salting). Commercial fishers were targeting for large pelagic species for both domestic and international market. Fish market system is diversified as inside and outside market distribution. Moreover, fish and fishery products in fresh form are used for inside market distribution while frozen, processed (dried, salted and Maldive fish) and imported forms are used in outside distribution. Fish marketing at producing areas takes different forms. Fish landing centers at rural areas and migrant fishing areas, fishers supply their catch to a pre arranged trader. The trader is proving financial (In advance money) and other facilities to the fishers and helping to bare the emergencies. In contrast, landing sites in cities and urban areas, the producer has more bargaining power. Fishers can negotiate the sale every day with one of several small-scale traders. Most of the places carry out daily auctions at auction halls in landing sites. Domestic fish market is handled mainly by the private sector and small portion is belongs to the Ceylon Fisheries Cooperation (CFC). The CFC operates about 70 purchasing centers seasonally at important fish landing sites. CFC has its own cold storage facilities at main fishery harbors, such as Galle, Beruwala, Matra, Tangalle, Hambantota, Kirinda,etc. Fish transportation to the central whole sale market or regional wholesale markets is done in insulated or non-insulated covered transport vehicles. In generally, wooden, plastic and rejiform boxes are used for packing. Retailers and wholesalers at divisional secretariat level (towns and villages) were the bottom level of the marine fish marketing network. Wholesale market system is two staged and consisted of producing area and consuming area. There were 12 fishing harbors, 34 anchorages and 650 landing sites along the coastal belt. Auction halls were adjacent to the landing sites in many places and others carry out daily auctions at landing sites. Part of the fish catch is consigned to central whole sale market (St. Johns) at Colombo. Rest of the catch is distributed directly and indirectly through small scale retailers such as private and CFC fish stalls, weekly fairs (pola) at small market towns, venders, daily market and super market in larger towns (see figure 4) At this level middlemen act as a micro-finance source for fishermen and contracting their entire catch. At district level retailers and wholesalers were based at municipal fish markets. Wholesalers bid for catches at auction halls in landing sites, which are consigned primarily to Colombo-central wholesale market (figure 3 shows the operating system of the central wholesale market) and ultimately sold to consumers through a chain of smaller retailers. In addition to that parts of catch were directed to export processors. Secondary whole sale markets exist at provincial level (see figure 5). Whole sale markets at provincial level supply fish to both retailers and central whole sale market. Central and local governments were responsible for providing market infrastructure including roads, harbors, auction halls, markets, water and electricity and cold storage (chilled and frozen). Ice supply and transportation are mainly handled by the private sector. In addition to that CFC has control over limited capacity of ice supply, cold storage and transportation through insulated and non insulated cooler wagons.
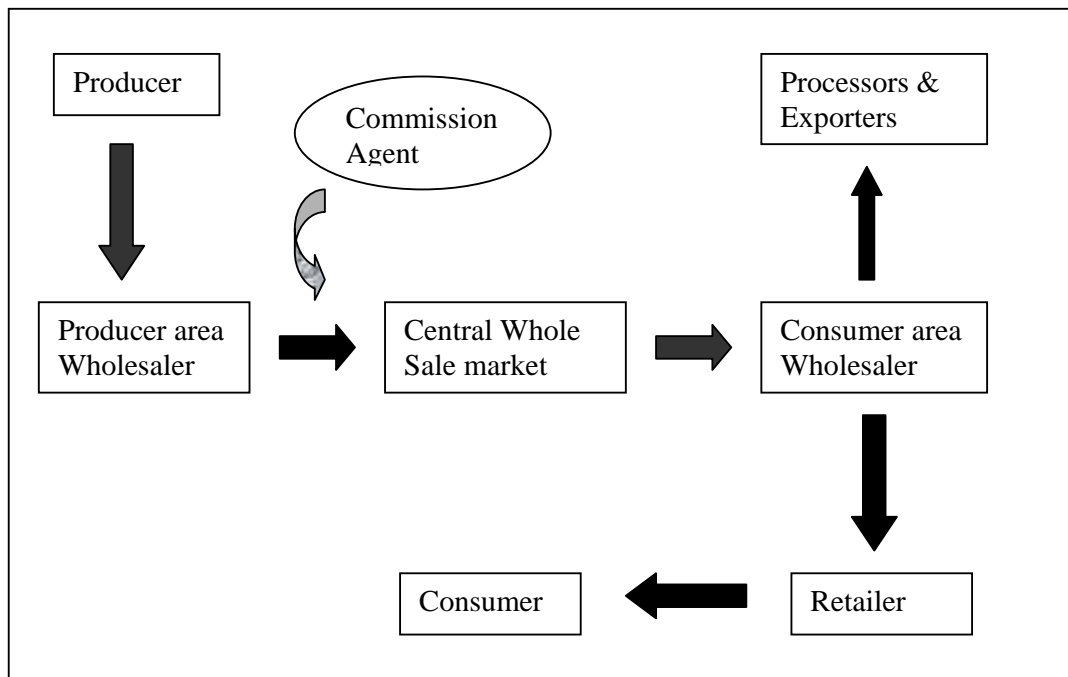
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Figure 3. The operating system of Central whole sale market (St.Johns market) at Colombo
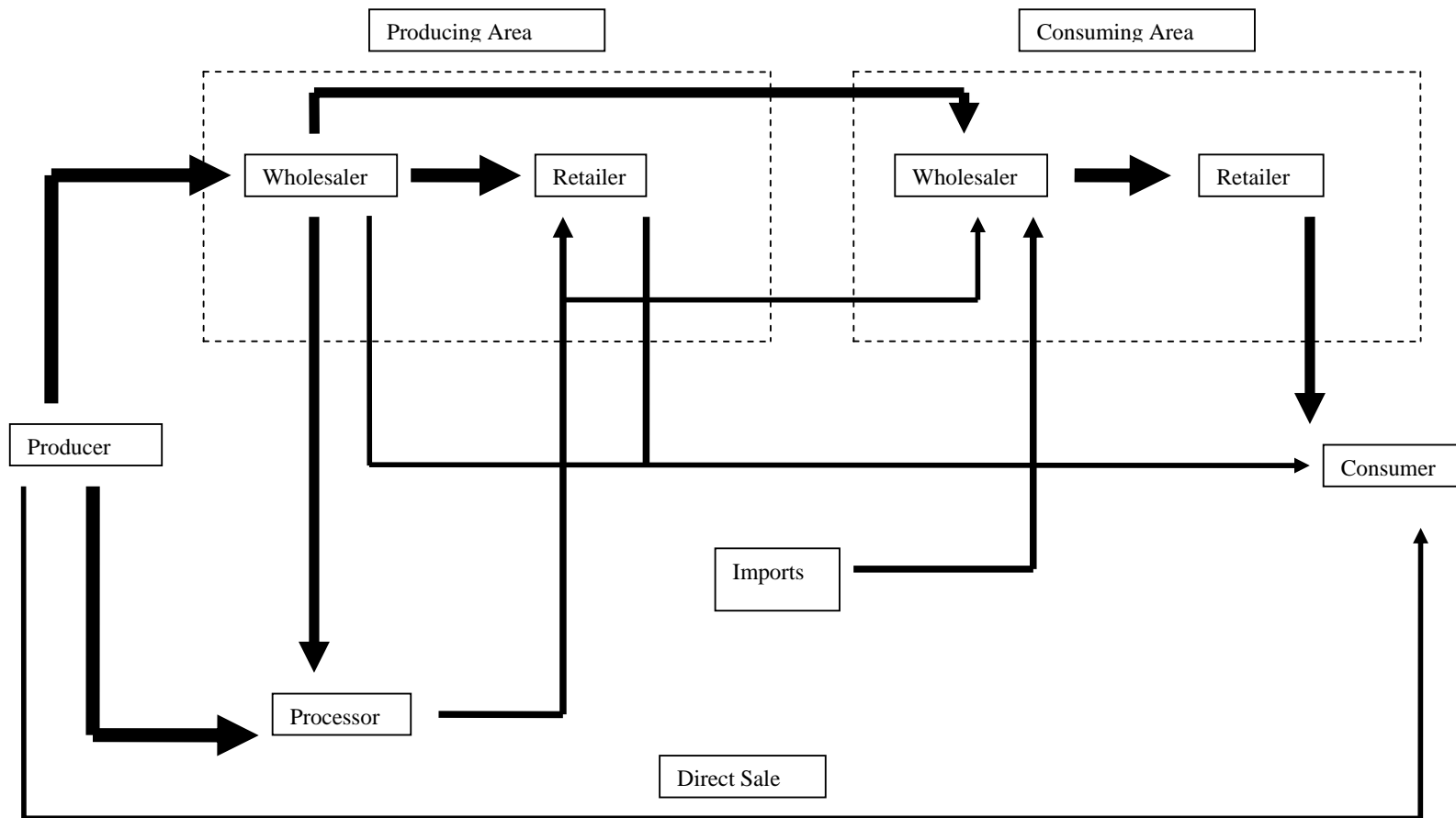
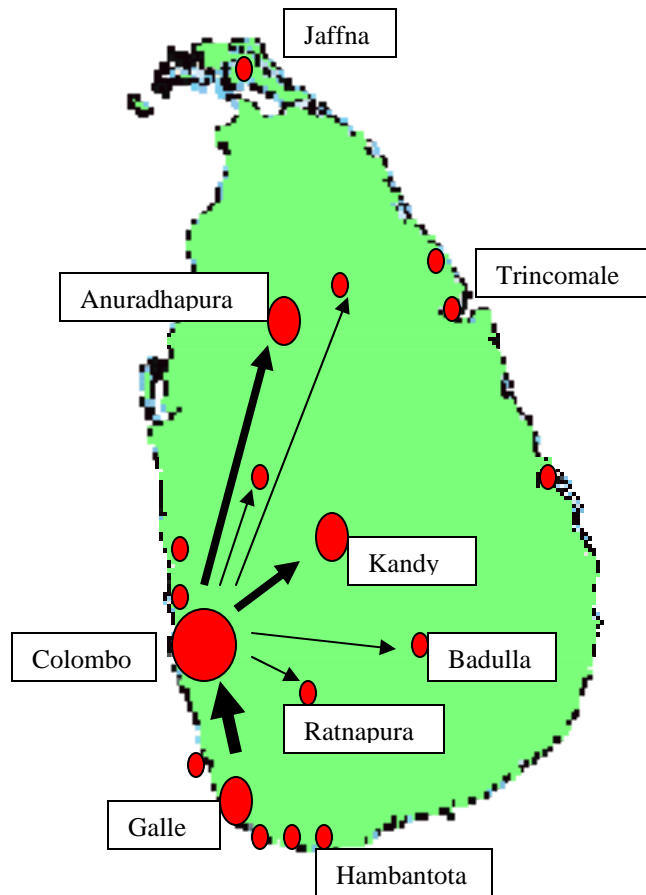**Figure 4. Network for marine fish marketing and stake holders**

Figure 5. Establishment of wholesale markets and regional markets

Post tsunami losses to the fisheries sector were heavy. E.g. 7105 vessels damaged, 9207 engines destroyed, ten major fishing harbors completely destroyed, 34 anchorages and 250 landing sites located at southern and eastern provinces damaged in various degrees (Ministry of Fisheries and Aquatic Resources, 2005). Other facilities damaged include fisheries cooperative society buildings, fish collection and distribution centers, 18 ice plants and 28 cold rooms were damaged severely. E.g. In south 5 ice plants were badly damaged and all fuel and water supply systems located in the fishery harbors have been damaged. Ice plants, retail outlets at Galle and Matara and cold storage facilities belong to CFC had to faced severe damages. Many municipal fish markets in southern province were badly affected by the tsunami. E.g. Municipal fish markets at Galle (18 stalls), Matara (22 stalls) and Hambantota (14 stalls) were completely destroyed by the tsunami (Subasinghe, 2005). Moreover, producer area fish markets were affected badly. The fish packing plant in the Galle fishery harbor premises was completely damaged by the tsunami. Privately owned fish stalls were responsible for handling major portion of retail business. Many privately owned fish stalls located at strategic points of villages, towns, cities and along the Colobmo- Galle Highway destroyed by the tsunami. Foot cycle and motor cycle venders were affected severely. According to the findings of Subasinghe (2005), more than 3000 foot cycle and motor cycle vendors were severely affected.

Network for Inland Fish Marketing

In contrast to the marine fish marketing, the bulk of inland fish production is marketed in close proximity to the production base. Limited portion of inland fish catch goes for processing, Such as for filleting and drying. Principally, foot cycle, motor cycle and three wheeler venders carry out the retailing of inland fish. Some portion of catch was directly sold to the consumers living closer to the landing sites. Marketing network is always based on the large inland reservoirs or tanks. The greatest volume of fish, flows through small-trader networks and relatively little production enters wholesale networks (Murray and Little, 2000). Inland fish marketing net work was not disturbed by the tsunami.
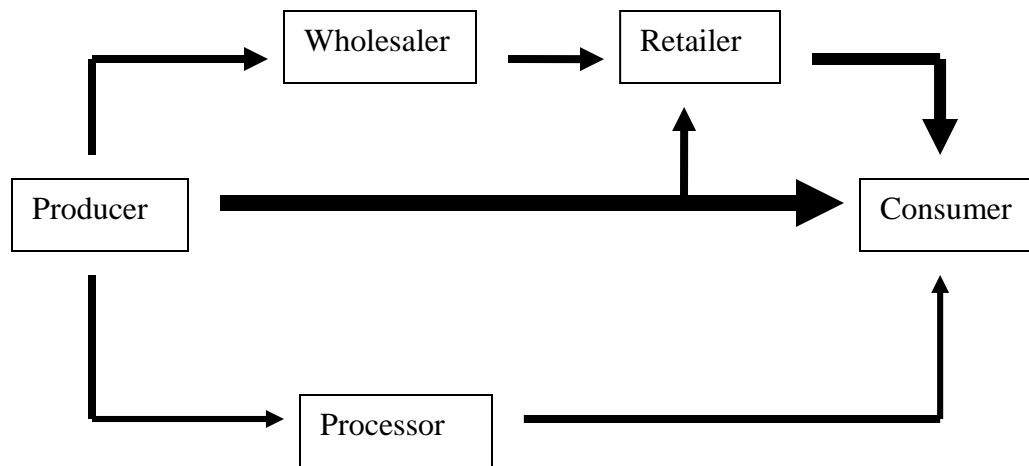
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Figure 6. Marketing network for inland fish and stake holders

Post –Tsunami Fish Consumption

Fish plays a major nutrition role in all of the countries hit by the tsunami and Sri Lankans have huge appetite for fish. Moreover, due to the religious impacts, Sri Lankans are fish eaters then meat eaters. Rumors that it is dangerous to eat fish that have been proximity or have fed on victims bodies are crises-crossing southern Asia (ICSF, 2005). An average Sri Lankans seafood plate consisted of 45% of large marine fish 38% of small marine fish, 16% of fresh water and 1% of aquaculture fish. In Sri Lanka, preference for fish is depend on the income level of the consumers, such as fish basket of upper and middle class consumers consisted of higher valued and large pelagic species (Seer, Yellow fin tuna, Skip jack and shrimp). Moreover, the lower class consumers prefer low value and small species (rock fish, shore seine varieties). Fish preferences among Sri Lankan consumers are differ according to the region. E.g. Consumers of south prefer large pelagic species (blood fish). In contrast, consumers of north and east place high demand for rock fish and shore seine varieties. In Colombo, the most preferred were the white flesh fish, such as seer, Trvelly. Production of small shore seine varieties dropped after the tsunami. Heavy damages to the reefs and coastal environment lead to low catches. Moreover, small shore seine varieties played as an important source of animal protein for the lower income groups. Distribution system (peddlers) of the small shore seine varieties was badly affected by the tsunami and reduced the supplies to the rural areas. Increased protein malnutrition was the indirect impact.
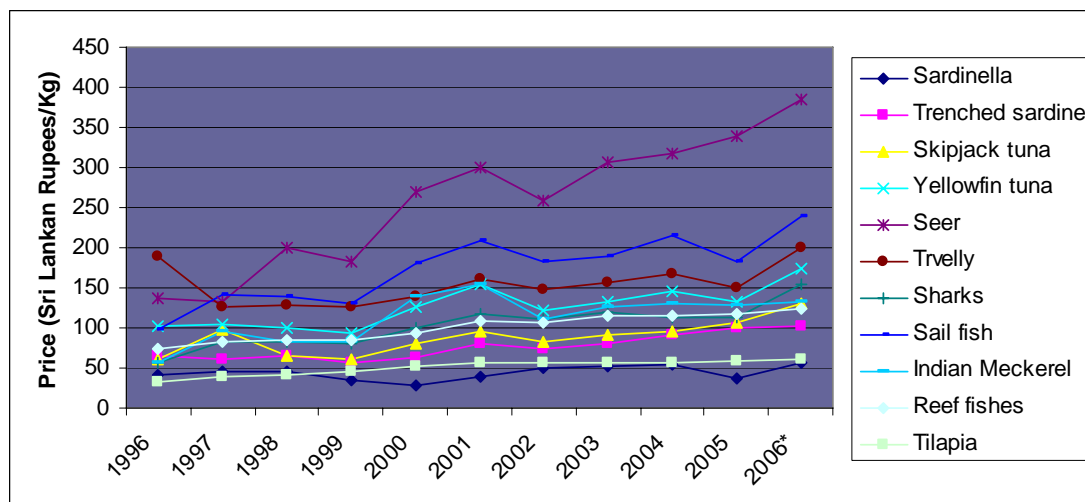
Figure 7. Wholesale prices of fresh fish at Colombo central fish market (Sri Lankan Rupees /Kg).
Source: Hector Kobekaduwa Agrarian Research and Training Institute of Sri Lanka, 1996-2006.

Both wholesale and retail markets experienced short term drop of the prices of marine fish (see figure 7 and 8). Decreased demand for fresh fish, especially for the large pelagic species such as shark, seer, tuna, etc. was observed. Moreover, the market demand for inland fish (Tilapia) and small marine species was increased. Rumors of unsafe fish and the beliefs that large species will eat death bodies led decrease the demand for larger fish. Marine fisheries sector has had to face severe damages from tsunami and it leads to sharp decrease (50%) of domestic fish supply (Ministry of Fisheries and Aquatic Resources, 2005). Shortage of domestic fresh fish supply and rumors of unsafe fish lead to short term declining of fresh fish consumption. But fish consumption of average Sri Lankan was dropped up to 12 Kg during the post tsunami period. Consumer demand for canned and dried fish was increased. In addition to that, sharp price hike of canned and dried fish was observed short termly in retail markets. Drastic retail price fluctuations were due to non availability of stocks to fulfill the market demand and canned fish have also been an important food staff in relief programmes.

Both import and export quantity of fish and fishery products was decreased after the tsunami. Lower fish production made low exports. On the other hand bad economic situation of the country was resulted lower the purchasing power of consumers. Low demand for imported fish and fishery products and donations of canned and dry fish products lead to lower the imports. Moreover, canned and dried fish were common in most of the donated food supplies.
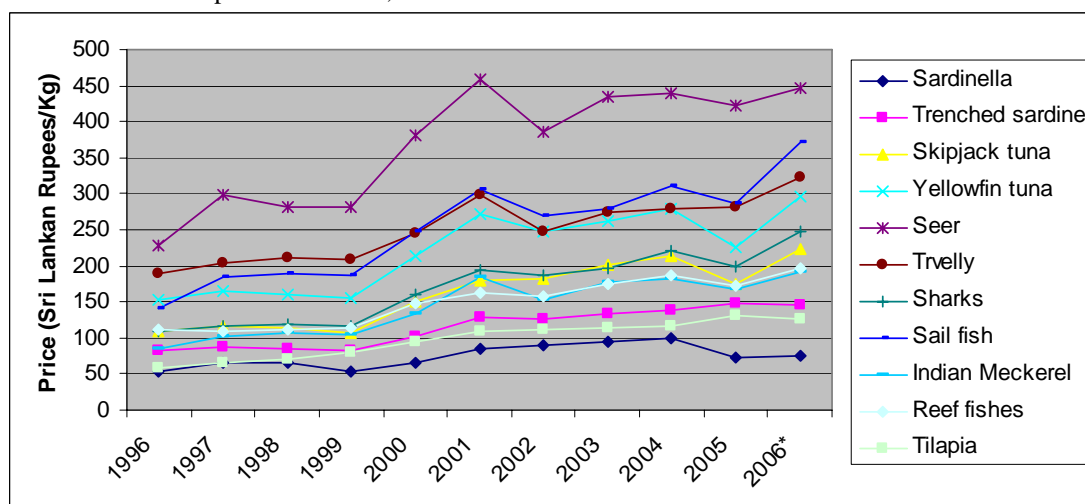

Figure 8. Consumer prices of fresh fish at Colombo city region (Sri Lankan Rupees /Kg).
Source: Hector Kobekaduwa Agrarian Research and Training Institute of Sri Lanka,1996-2006.

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CONCLUSIONS

Marketing network for the marine fish is established along the coastal belt and most expanded compared to inland fish marketing. Fresh marine fish always receives high demand in cities, towns, urban centers and in coastal villages. In contrast, inland fish is popular in villages of dry zone. On the other hand, canned fish and dried fish are popular among mid and lower income earners allover the country and considered as a good substitute for fresh fish. Three different levels were identified in domestic fish market. Colombo central wholesale fish market is at the apex level. Regional fish markets of Galle, Kandy and Anuradhapura are operating individually and have links to the national and district level. The bottom level consisting with municipal fish markets, city and town public markets and village level markets based on landing sites. In land fish marketing networks are based on large, medium and small irrigation schemes, where producers directly sell their catch to retailers, assembles and consumers. The involvement of processors and middlemen is limited. The tsunami's damage to the domestic fleet operations and market infrastructure were led to sharp declining of fish supply to the domestic market. Rumors of unsafe fish were reduced the demand for fresh fish while increasing the demand for canned and dried fish. Both retail and wholesale fish prices were dropped short termly. Relief and rehabilitation efforts were made fishing fleets available and rebuild the market infrastructure. On the other hand, fishers are operating again and markets are receiving the fish catches. Tsunami has devastated not only the retailing network but also the employment of thousands of fishers, traders, processors, exporters directly or indirectly. There is urgent need to carry out need assessment on each and every sector affected by the tsunami. Moreover continuous monitoring and evaluation on rehabilitation and reconstruction is needed.

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