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Marine Fisheries Sector Assessment in Eastern Sri Lanka

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Marine Fisheries Sector Assessment in Eastern Sri Lanka

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The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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Acronyms

ACIAR	-	Australian Council for International Agricultural Research
ADB	-	Asian Development Bank
ADD	-	Agrarian Development Department
ARDQIP	-	Aquatic Resource Development & Quality Improvement Project
CFC	-	Ceylon Fisheries Corporation
BIA	-	Bandaranaike International Airport
CIDA	-	Canadian International Development Agency
CORE	-	Connecting Regional Economies project
CSR	-	Corporate Social Responsibility
DANIDA	-	Danish International Development Agency
EDB	-	Export Development Board
EEZ	-	Exclusive Economic Zone
EP	-	Eastern Province
EU	-	European Union
FAO	-	Food and Agriculture Organization
FCS	-	Fisheries Corporative Societies
GDA	-	Global Development Alliance
GDP	-	Gross Domestic Product
GPS	-	Global Positioning System
HACCP	-	Hazard Analysis Critical Control Point
IDRC	-	International Development Research Centre
IFAD	-	International Fund for Agricultural Development
INGO	-	International Non-Governmental Organization
ITI	-	Industrial Technology Institute
JICA	-	Japan International Cooperation Agency
KOICA	-	Korean International Cooperation Agency
LKR	-	Sri Lankan Rupees
MASL	-	Mahaweli Authority of Sri Lanka
MFAR	-	Ministry of Fisheries and Aquatic Resources
NAQDA	-	National Aquaculture Development Authority of Sri Lanka
NARA	-	National Aquatic Resources Research & Development Agency
NDB	-	National Development Bank
NDTF	-	National Development Trust Fund
NGO	-	Non Governmental Organization
NIFNE	-	National Institute of Fisheries and Nautical Engineering
NORAD	-	Norwegian Agency for International Development
ODA	-	British Overseas Development Administration
OFEASL	-	Ornamental Fish Exporters Association of Sri Lanka
SEASL	-	Seafood Exporters Association of Sri Lanka
SIDA	-	Swedish International Development Agency
SME	-	Small and Medium Enterprises
UNDP	-	United Nations Development Program
USAID	-	United States Agency for International Development
USD	-	United States Dollar

Executive Summary

Nationwide, fishing is the principal employment for 250,000 persons in Sri Lanka, about 2% of the workforce. In 2008 the fishing sector contributed LKR 66 billion (USD 600 million) to Sri Lanka's GDP at current prices, about 1.5%. In 2008, 93% of all fish caught in Sri Lanka was consumed in the country. Less than 7% was exported. The value chain for fish sold in the domestic market is well established, and functions around a major wholesale market in Colombo. The value chain serving the domestic market moves marine and inland fish from landing sites and auction markets across the island to wholesale and retail markets located mainly in Colombo. The trip typically takes 8-10 hours for a truck forced to deal with poor roads and security check points. Most trucks are refrigerated or use ice. Boats, trucks, processing plants and most ice plants are privately owned. Landing points, auction sites and markets are government-owned with stalls leased to the private sector. Except for fishers' cooperative societies, fishers rarely own either boats or vehicles. Most day-fishers are paid for their catch in cash at landing points along the coast by boat owners or representatives of wholesalers. Sri Lanka also has more than 2,800 multi-day boats and at least one fishing fleet that fishes international waters south of the island. Overfishing occurs on the coastal shelf, as a result of which the government is encouraging multi-day fishing as an alternative option to the excessive use of day-boats.

While total output of fish in Sri Lanka has grown steadily, average productivity has not. Post harvest handling practices, with much needed training and better enforcement of regulations, tend to reduce rather than enhance market value. Cold chain systems are weak or nonexistent and banking credit facilities need to be expanded. Although it is possible to accommodate investments for improvements in the value chain for the domestic fish market, as well as in the cold chain for the export market, commercial feasibility is a key consideration. The general perception is that the average Sri Lankan consumer will be reluctant to pay a price premium for fish that have been handled according to international standards. However, the long term outlook on global demand looks strong, fetching high prices due to increased demand and low supply from overfishing.

There exists another value chain moving a small volume of premium quality fish products from Sri Lanka into the export market. Major consumers include nations such as the European Union (EU), the U.S., and Japan. This chain also serves a more demanding segment of the local market that includes tourist hotels and high-income urbanites. This value chain follows international best practices and uses HAACP-certified and EU approved processors and export houses, which are mostly located in the Western Province closer to the Colombo port and the international airport. Products include high-value niche products such as sushi-grade tuna for Japan, fresh lobsters, fresh and frozen prawns, and fresh and frozen fish shipped by container to the EU and Japan. In 2008 Sri Lanka exported 21,000 MT of fish that earned LKR 19.1 billion (USD 176 million). Although it was only 7% of the fish caught that year, the exported fish accounted for 29% of the total value contributed by the sector to GDP. Findings show potential in exports of lower-priced, popular varieties of inland-farmed fish, processed to meet specific market demands that provide a competitive advantage. Sri Lanka also imported about 76,000 MT of fish in 2008, mostly dried and canned for local consumption. The cost of those imports in 2008 was LKR 12.5 billion (USD 116 million). An increase in fresh catch is unlikely to reduce imports unless more canning and drying facilities are opened in the island.

Since the end of the war in May 2009, both the government and the private sector have been announcing planned investments to upgrade facilities and handling methods at key points in the value chain serving the domestic and export markets. Live (ornamental) and fresh fish exporters have joined with exporters of other perishable products to advocate for better cold storage facilities at the government-run Bandaranaike International Airport along with expedited export document processing.

About 70,000 of the marine fishers and 6,400 of the inland fishers live in the Eastern Province. Although the Eastern Province accounts for less than 8% of Sri Lanka's total population, it is home to 41% of the country's marine fishers and 34% of the country's marine fishing craft. In 2008 the Eastern Province marine fishers caught 28% by weight of all the marine fish caught in Sir Lanka. Another 6,400 fishers live inland in the Eastern Province and earn some or all of their income catching fresh fish from inland reservoirs or tanks. Inland fishers in the Eastern Province represent 20% of all the inland fishers in Sri Lanka, and produced 19% of all "inland" fish produced in 2008.

The end of the war has dramatically changed the outlook for fishers and fishing in both the East and North of Sri Lanka. Fishers and the traditional supply chain have already begun to take advantage of the new environment. Partly as a result of the rehabilitation programs following the tsunami, the fleet of fishing vessels in the East at present is 32% larger than it was in 2004, prior to the tsunami. Fishing activity and the volume of fish from the East reaching the Colombo market has already begun to increase, helping to lower retail prices in Colombo.

The following is a quick summary of the recommendations for the fishing sector overall and the Eastern Province in particular.

Overall Sector Recommendations:

- Adopt fishing methods, such as multi-day boat fishing that can protect the sustainability of the country's marine resources where coastal water fishing is nearing its maximum sustainable yield and the Exclusive Economic Zone (EEZ) could yield an additional 100,000 MT per year sustainably.
- Invest in a modern "cold chain" is suited to the current post war climate in which there is potential for exports of high-value fish and an increased demand with the expansion of key supermarket operations.
- Increase overall exports through demand driven exports of low-priced, popular varieties of inland-farmed fish (frozen) and processed fish (with Sri Lankan spices) to targeted countries with higher volume purchase power.
- Encourage and enable the more entrepreneurial fishers and fishery cooperatives to invest in their own productivity, by investing in new technology. Needed investments in other parts of the value chain such as post harvest handling, i.e. sorting, dressing, packing, ice storage, transport and cold chain management, will create job opportunities into which fishers can migrate. Growth in tourism, recreational fishing, water sports, retail services and other sectors can also contribute.

Recommendations for the Eastern Province:

- Provide marketing assistance to fishers in the East and assist in establishing contacts and market links with exporters in Colombo to sell high-value fish especially of species with high price export potential to lucrative markets, and thereby increase revenues.
- Continue with the national trend towards offshore fishing, but encourage the use of long-line fishing for large species and provide assistance for investment in multi-day boats. An added benefit to the fishers would be the availability of navigation equipment and training for ocean-going fisher vessels.
- Locate more processing units and undertake more value addition in the East – sorting, grading handling of fresh fish, drying, and packing dried fish. Encourage low productive fishers to either migrate into these areas or offer vocational training programs so that they have alternative options for sustainable income.
- Improve cold chain facilities and handling procedure from vessel to market, and replace wooden boxes used in sorting and shipping with plastic crates. One way to improve handling procedures would be to enforce handling and sanitary regulations at markets.
- Provide better cold storage facilities at the BIA airport in Colombo along with more efficient documentation processing for fish exports.
- Remove restriction on fishing times and locations for fishers in Trincomalee and develop a regional domestic airport to serve the region.
- Improve market links to major hotel and supermarket chains, and assist the producer to establish sustainable activities with these buyers.
- Provide technical training in techniques of long-line fishing for large fish and, proper post-harvest practices. Provide other types of training on financial management, savings and insurance. Collaborate with financial institutions in the area to make productive and safety investments such as long-lines to replace gill nets, Global Positioning System (GPS) and fish finding equipment; plastic crates, ice-making equipment, packing equipment, trucks, and multi-day fishing boats.
- Collaborate with a telecom service provider to offer training in use of cell phones to order ice for landing points and to check market prices for fish species.
- Assist women with activities related to sorting, handling of fresh caught fish, drying, and packaging smaller fish, through a pilot training program on simple, low cost packaging and labeling techniques tied to demonstrable economic benefits (e.g., buy contracts from supermarket chain).
- Collaborate with leading supermarket chains or a Sri Lankan company that is advanced in packaging (e.g., a spice company) and would be able to (a) provide the correct training and (b) offer to buy properly handled product.
- Create an introductory linkage between established adventure tourism operators in the West and entrepreneurial fishers in the East interested in future tourism development.
- Identify opportunities in crab collection in lagoons in Batticaloa using the caging method. Collaborate with entrepreneurs willing to expand the pen and cage system for fish culture in Eastern lagoons.
- Assist in establishing market links with potential buyers of chicken feed, who would lease a small-scale grinder and pay women who collect cockle shells in Kappalthurai, Batticaloa.
- Collaborate with entrepreneurs willing to invest in agar extraction from seaweed.

1. Introduction

Building on over 25 years of the U.S. Agency for International Development's (USAID) successful economic growth activities in Sri Lanka, the Connecting Regional Economies (USAID/CORE) Program seeks to address a subset of Sri Lanka's regional economic growth challenges, created during the country's recently ended 30-year war. The USAID/CORE Program seeks to address the large disparity in economic development between the conflict-affected areas in the Eastern, North Central and Uva Provinces of Sri Lanka and the rest of the island.

At the center of sustainable development is the challenge of expanding and improving value chains in Sri Lanka within the former conflict areas (Ampara, Batticaloa, and Trincomalee Districts in the Eastern Province) and conflict bordering areas (Anuradhapura District of the North Central Province and Monaragala District of the Uva Province) so that primary producers can better participate in mainstream businesses and some, as a consequence, become entrepreneurs. The approach, at one end, links value chains to end users (Sri Lanka and globally) who demand goods and services produced and, at the other end, empowers and enables key stakeholders to participate in value chains as entrepreneurs and farmers. From this, strong mid-level entrepreneurs will develop, creating a viable sustainable value chain.

This report presents the findings from a rapid assessment of the fisheries value chain in the Eastern Province, and looks at the constraints and potential opportunities for value addition that can be sustained through better linkages to domestic and export markets. Based on the findings, the report identifies specific opportunities for investment to enhance the fisheries and Aquaculture[1] sector competitiveness and benefit beneficiaries of the USAID/CORE target areas, and recommends potential interventions by USAID/CORE as part of the development strategy for the target areas.

The assessment was completed in two stages. The first assignment was undertaken for a period of 25 days during May, during which one trip each was made to Trincomalee, Batticaloa and Ampara. Discussions were held with representatives of the concerned private and public sector organizations, including fishers' Cooperative Societies, Chambers of Commerce, proprietors of long-line fishing vessels, ice plants and processing plants, field officers of the Ministry of Fisheries and Aquatic Resources, senior public servants in the Province, traders, market vendors and operators of fish cages. Following the official end of the war, the report was updated and revised in July–August 2009. In addition, a separate analysis was commissioned to focus on particular opportunities in aquaculture and inland fisheries, provided in a separate report "Assessment of Aquaculture and Inland Fisheries".

The first section of this report provides an overview of the fisheries sector in Sri Lanka, including actors, production, consumption, trade and natural resources. Section 2 gives an analysis of the sector value chain and policy environment to provide a look at strengths, weaknesses, opportunities and threats. The report concludes with recommendations for the sector.

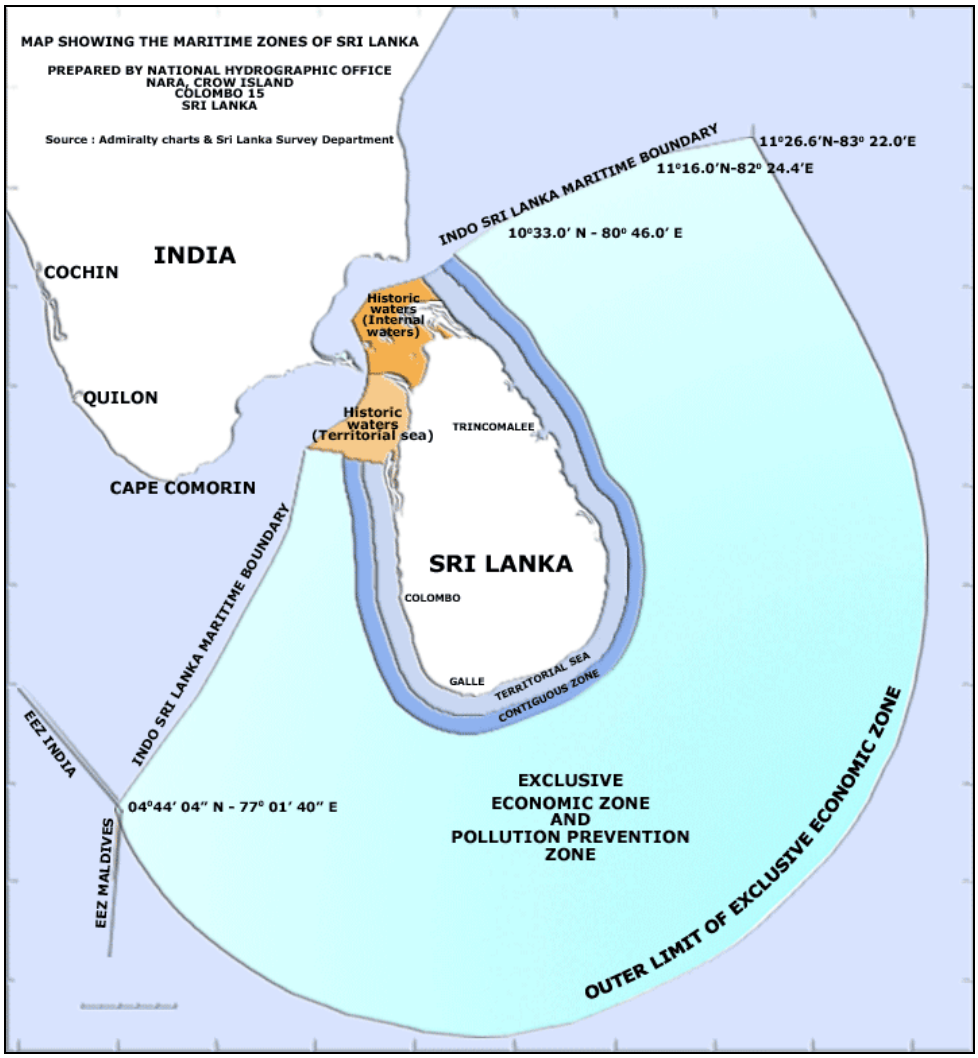
[1] Fisheries is defined as fish capture from the wild and Aquaculture is defined as farming.

2. Overview of the Fishery Sector in Sri Lanka

A. Marine Areas

Sri Lanka is an island of approximately 63,000 sq km with a coast line of 1,700 km and a continental shelf of nearly 31,000 sq km. The country possesses a territorial sea of 21,500 sq km and an Exclusive Economic Zone (EEZ) of 517,000 sq km, which extends up to 200 nautical miles from the coastline. The EEZ is expected to expand even further with the delimitation of the outer edge of the continental margin of the country, which would permit Sri Lanka to enjoy the ownership of the EEZ equivalent to 20 times the land mass it currently possesses (Figure 1).

Figure 1: Map Showing Current Maritime Zones of Sri Lanka



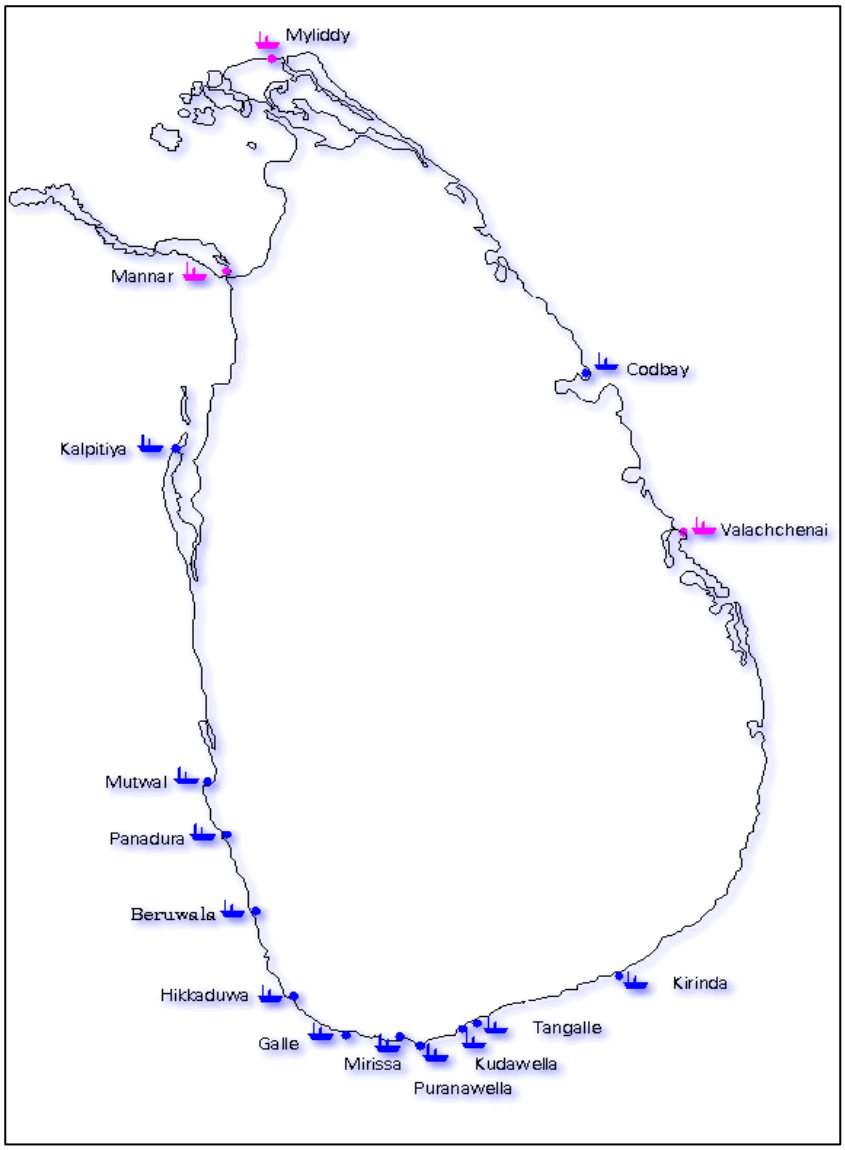
Source: National Hydrographic Office; NARA

Around the island, there are 12 fishery harbors in operation of which three are under various stages of construction, as well as 37 anchorages and about 600 landing centers (Figures 2 & 3). Two of the fishery harbors are on the East Coast in Trincomalee and Batticaloa.

The ocean area within Sri Lanka's jurisdiction has a very high concentration of marine resources. The continental shelf alone is estimated to have a potential yield of over 250,000 MT of fish annually.

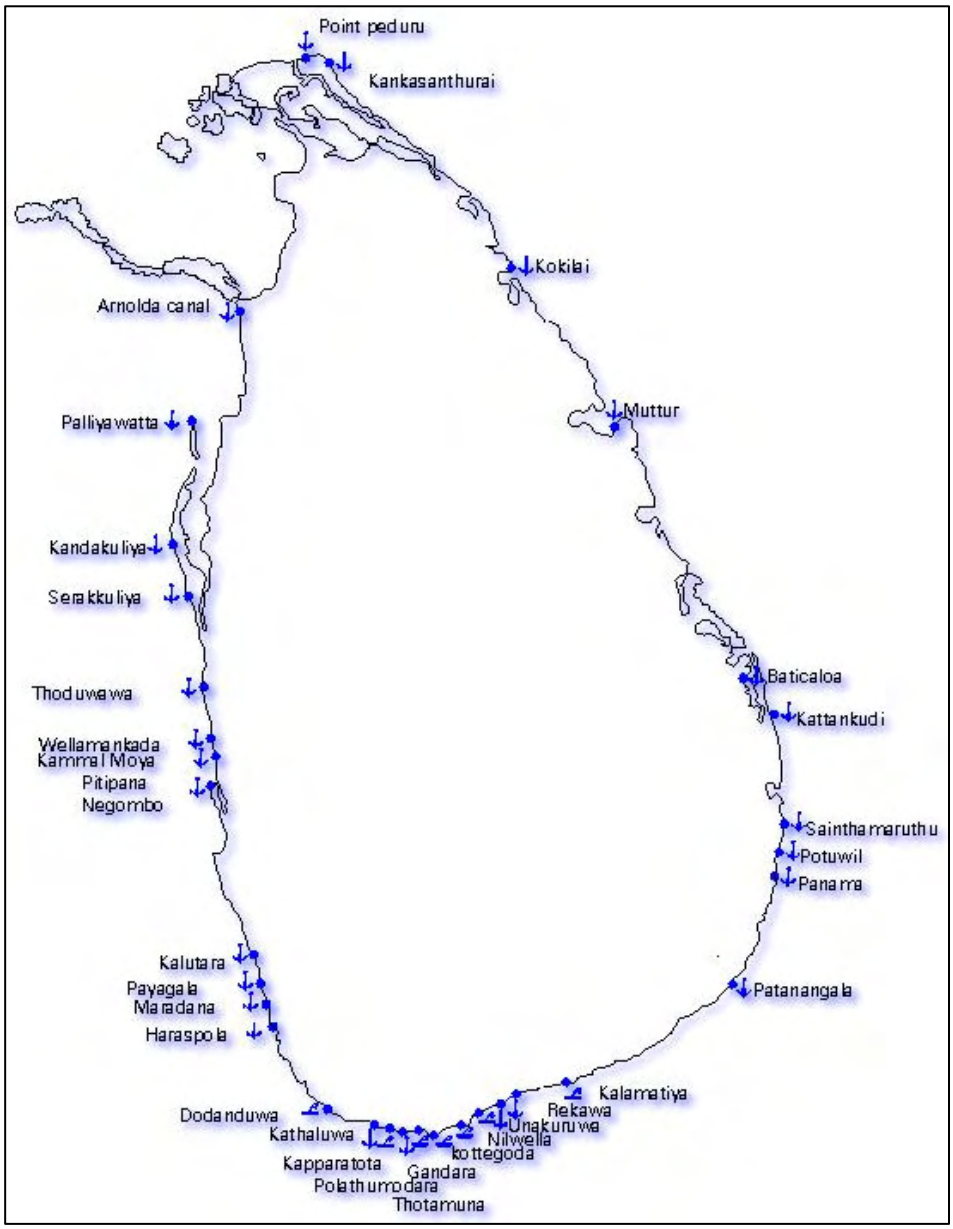
The estimated marine catch (continental shelf plus deeper waters) in 2008 was 275,000 MT. Cognizant about possible overfishing of coastal waters, the government is not encouraging the expansion of coastal fishing, but continues to promote the development of larger, multi-day boats, including conversion of smaller day-boats into multi-day boats that can fish further offshore. Although the deeper sea/offshore area within the country's EEZ is being considered, currently little is being utilized, showing potential to enhance the yield of tuna.

Figure 2: Fishery Harbors of Sri Lanka



Source: National Hydrographic Office; NARA

Figure 3: Anchorages of Sri Lanka



Source: National Hydrographic Office; NARA

Coastal Resources

The coast of Sri Lanka is endowed with rich aquatic habitats. There are about 45 brackish[2] water estuaries and lagoons, and also mangroves and salt marshes spread throughout the coast line with a combined total surface area of 242,024 ha (Table 1). However, the low tidal amplitude and the topography of the coastal areas in the country have naturally restricted the inter-tidal area available for brackish water aquaculture.

[2] Brackish water is defined as water that has a salinity level between fresh water and marine water.

Table 1: Principal Coastal Habitat by District (Ha)

District	Mangroves	Salt Marshes	Dunes	Beaches Barrier Beaches Spits	Lagoons and Basin Estuaries	Other Water Bodies	Freshwater Marshes
Colombo	39	-	-	112	-	412	15
Gampaha	313	497	-	207	3,442	205	1,604
Puttalam	3,210	3,461	2,689	2,772	39,119	3,428	2,515
Mannar	874	5,179	1,458	912	3,828	2,371	308
Kilinochchi	770	4,975	509	420	11,917	1,256	1,046
Jaffna	2,276	4,963	2,145	1,103	45,525	1,862	149
Mullaitivu	428	517	-	864	9,233	570	194
Trincomalee	2,043	1,401	-	671	18,317	2,180	1,129
Batticaloa	1,303	2,196	-	1,489	13,682	2,365	968
Ampara	100	127	357	1,398	7,235	1,171	894
Hambantota	576	318	444	1,099	4,488	1,526	200
Matara	7	-	-	191	-	234	80
Galle	238	185	-	485	1,144	783	561
Kalutara	12	-	4	77	87	476	91
Total Area	**12,189**	**23,819**	**7,606**	**11,800**	**158,017**	**18,839**	**9,754**

Source: National Aquatic Resources Research & Development Agency (NARA)

B. Inland Fisheries and Aquaculture Sector

Existing Water Resources

The country also possesses inland water resources of approximately 262,000 ha and 120,000 ha of brackish water resources (Table 2). These resources include a large number of water bodies in the form of large (>800 ha) medium (200-800 ha) and minor (<200 ha) perennial reservoirs, seasonal village tanks (1-25 ha) and estate tanks. There are 70,850 ha of major reservoirs, 17,000 ha of medium irrigation reservoirs, 39,271 ha of minor irrigation reservoirs, 8,097 ha of hill country reservoirs and 4,049 ha of floodplains. In addition, there are about 100,000 ha of seasonal village tanks which hold water for about 6-8 months a year. The total extent of these waters is about 262,000 ha, which includes 23,000 ha of Mahaweli reservoirs. Five large reservoirs comprising 13,134 ha are located in the East, of which the largest is the Senanayake Samudraya (7,790 ha) in Ampara. Several sections in this report provide an overview of information related to inland fisheries and aquaculture. See USAID/CORE report "Assessment of Aquaculture and Inland Fisheries in Eastern Sri Lanka" for more details on inland fisheries and aqua culture.

Table 2: Area Resources Available for Inland Fisheries and Aquaculture

Fresh water Resources	Area (ha)
Large irrigation reservoirs	70,850
Medium irrigation reservoirs	17,004
Minor irrigation reservoirs	39,271
Seasonal Tanks	100,000
Flood lakes and villus (plains)	4,049
Upland reservoirs	8,097
Mahaweli reservoirs	22,670
Sub total	***261,941***
Brackish water Resources	**Area (ha)**
Deep Lagoons and Estuaries	80,000
Shallow Lagoons / Tidal Flats	40,000
Sub total	***120,000***
Grand total	**381,941**

Source: NAQDA

C. The Eastern Province - Overview

The Eastern Province comprises three Districts: Ampara, Batticaloa, and Trincomalee. According to Fishery Statistics for 2008, the Eastern Province accounted for 15% of the national land area of Sri Lanka, 22% of the inland water area, 426 kilometers (23%) of the country's coastal shoreline, 7.5% of the country's population (20 million), 38% of the country's fishers, and 22% of total fish production.

1. Fishing Fleet

According to Fishery Statistics for 2008 the marine fishing fleet in Sri Lanka numbered 171,470 craft, of which 70,280 (41%) was located in the Eastern Province. In the same year, of the 2,809 multi-day fishing vessels in Sri Lanka, 1,001 (38%) were based on the East Coast. As of 2008, 52% of fishing craft in the Eastern Province were not motorized; 36% used an outboard motor, and 13% had inboard motors, including the 7% that were multi-day fishing boats. There is wide variation among the three Districts. Trincomalee is home to 680 multi-day boats while Batticaloa has 308 and Kalmunai (Ampara District) has only 13 multi-day boats.

2. Employment

In 2008 approximately 202,000 persons were employed as fishers in Sri Lanka, of which 171,000 as marine fishers, and 31,000 as fishers working in inland fisheries. Active fishers in the Eastern Province represented about 38% of all fishers in the nation. In 2008, as a sector, fisheries directly employed about 2% of Sri Lanka's active labor force of 7.6 million persons. In the 10-year plan (2007-2017) by the Ministry of Fisheries and Aquatic Resources, it was estimated that the fisheries sector provided direct employment to about 650,000 persons in 2007, including 100,000 in associated service activities such as fish processing, boat building, net making and public sector services, 400,000 in the fish trade and the balance as direct fishers. Based on a multiplier of indirect to direct employment of 4:1, the fishery sector contributes to the employment of approximately 2.4 million people. In many coastal areas over 10% of the population relies on fisheries for their primary source of income. Active marine fishers in the Eastern Province in 2008 numbered 70,280, 41% of the national total: 21,704 in the Ampara District; 24,840 in the Batticaloa District; and 23,700 in the

Trincomalee District. In addition, the Eastern Province accounted for 19% of all active inland fishers: 2,170 in Ampara; 2,260 in Batticaloa; and 1,480 in Trincomalee.

3. Production per Fisherman

In total the three Districts in the Eastern Province accounted for 41% of the employed marine fishers, 34% of the marine fishing craft, but only 23% percent of the marine fish production for Sri Lanka in 2008. Inland fishers in the Eastern Province accounted for 19% of the employed fishers, 18% of the craft and 19% of the inland fishery production in 2008. The low productivity of marine fisheries in 2008 was certainly due in part to the restrictions on fishing for security reasons. While the average fish production per marine fisher in Sri Lanka was 1.6 MT in 2008, productivity for marine fishers in the three Eastern Districts was 1.0 MT per fisher in Ampara, 0.9 MT in Batticaloa and 0.8 MT in Trincomalee. Productivity results for inland fisheries for the three Districts were: 2.4 MT per fisher in Ampara, 0.7 in Batticaloa, and 1.1 in Trincomalee. Detailed productivity figures for each District are found in the Fishery Statistics report for 2008 published by the Ministry of Fisheries and Aquatic Resources.

D. Production, Consumption & Trade

1. National Production

In the year 2008 total fish production in Sri Lanka reached 319,000 MT, a record amount, but only 5% above the previous best year production of 303,000 MT in 2002. The bulk of the fish production (86%) came from the coastal and offshore fisheries sub-sectors, while 14% came from inland fisheries and aquaculture (Table 3). Notable growth occurred in offshore/deep sea fish production due to a government policy that encouraged fishers to fish further offshore by providing information on fishing grounds. Sri Lanka's marine fish catch from deeper offshore waters rose from 36% in 2002 to 41% in 2007 and slipped back slightly to 40% in 2008.

Table 3: National Fish Production by Sector

National Fishery Sector	*MT '000*		% of Total	2008/2007 % increase
	2007 (a)	2008		
Marine (b)	253	275	86%	9%
Aquaculture and Inland Fisheries	38	44	14%	16%
Total	**291**	**319**	**100%**	**10%**

a. Revised
b. Coastal & deep sea
Source: Fishery Statistics 2008; MFAR

Table 4: Marine Fish Production by Type - 2008

Marine Fishery Sector	Sri Lanka '000 MT	Eastern Province '000 MT	East as % of Sri Lanka
Skipjack (a)	61.5	7.9	13%
Yellow Fin (a)	47.6	13.4	28%
Other Tuna –like (a)	31.5	5.0	16%
Shore Seine	68.9	21.8	32%
Prawns	9.2	1.9	20%
Crabs	1.8	.8	41%
Lobster	0.7	.3	42%
Other	53.4	10.9	20%
Total	**274.6**	**61.9**	**23%**

(a) Tuna caught in multi-day boats can be landed in other ports

In 2008, about 24% (69,000 MT) of all marine fish caught in Sri Lanka were small shore seine fish. Small fish caught in other categories including "shore-sein" fish, gives a total quantity of fish classified by the Statistics Unit of Ministry of Fisheries and Aquatic Resources (MFAR) as "Fish for drying or smoking" of 93,240 MT (29% of total catch) in 2008 (Table 4.1 in Fishery Statistics 2008).

2. Eastern Province Production

In 2008 the Eastern Province contributed about 71,000 MT (22% by weight) to national fishery production: 61,900 MT of marine fish and 8,600 MT from aquaculture and inland fishery production. Growth in marine fish production in the East was significantly higher than the 10% average growth in production for the nation as a whole. Aquaculture and Inland fishery production from the Eastern Province grew 27% from 2007 to 2008, while marine fishery production grew 89%.

The increase in marine fishery production in 2008 was due to favorable weather conditions, the resumption of fishing activity that followed resettlement of internally displaced persons and an easing of restrictions on fishing boat operations in the Eastern Districts. Even in Trincomalee, where significant restrictions remained in place during 2008, fishers managed to double their 2007 catch (Table 5). Inland fish production in the Eastern Province also increased in 2008 by 27%, also greater than the national average mainly due to better management of water bodies through better community participatory programs and increased fingerling stockings.

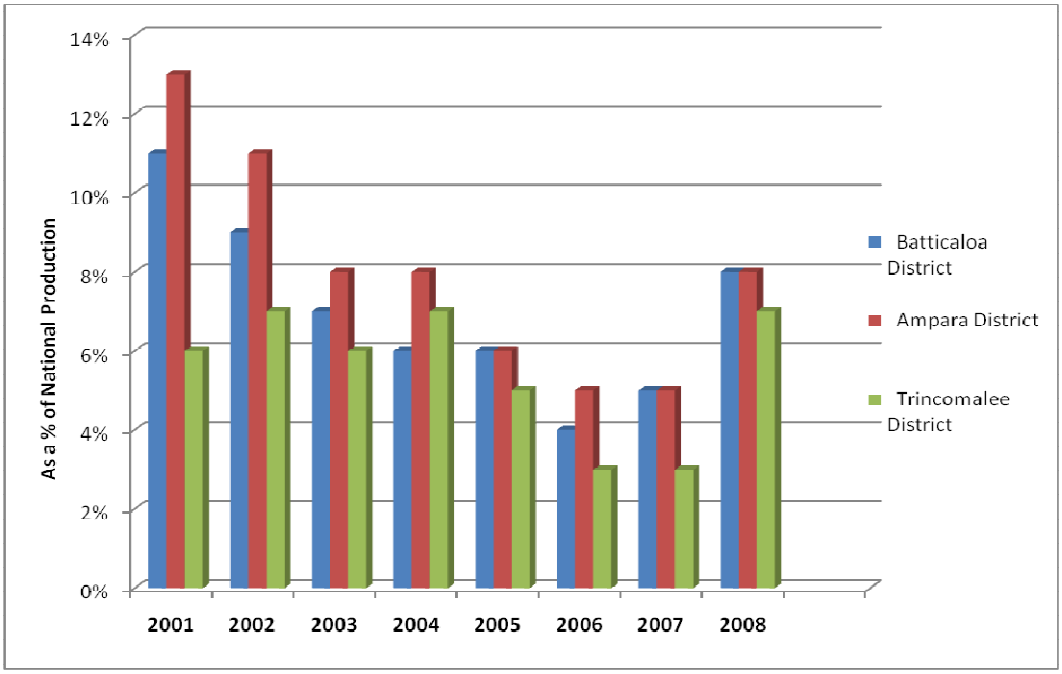
Table 5: Eastern Province Fish Production in MT

Eastern Province Fishery Production	2007 '000 MT	2008 '000 MT	2008/2007 (% increase)
Marine (a)	32.7	61.9	89%
Aquaculture and Inland Fisheries	7.1	8.6	27%
Totals	**39.8**	**70.5**	**44%**
Eastern Province as % of National	**%**	**%**	
Marine (a)	**13%**	**23%**	
Aquaculture and Inland	**18%**	**20%**	
Total	**14%**	**22%**	

a) Coastal & deep sea
Source: Fishery Statistics 2008; MFAR

Table 6 below shows marine fishery production for the three Districts of the Eastern Province from 2001 to 2008. Total production declined 29% from 2002 to 2005 - before the tsunami of December 2004 and dropped another 58% in the year after the tsunami. From 2005 to 2008 marine fish production in the East almost tripled, reaching 62,000 MT in 2008, 83% of its best pre-tsunami year of 75,000 MT in 2001

Table 6: Marine Fishery Production in Districts of the Eastern Province and Contribution to Total National Fish Production: 2001-2008 (MT)



Source: Statistics Unit Ministry of Fisheries and Aquatic Resource

3. Consumption – Domestic Market

Most of Sri Lanka's fish production is consumed within the country. In 2008 only 7% by weight of domestic production was exported. The following sections discuss the domestic consumption, the market and imports.

Over 360,000 MT of fish are consumed annually in Sri Lanka. The net fish production in Sri Lanka contributes to 80% of the current domestic demand (by weight), and the balance is met through imports.

Per capita fish consumption in Sri Lanka has risen over the years and currently has stabilized at around 9 kg/year. This is lower than the value of 21 kg/person/year recommended by the Sri Lanka Medical Research Institute. On average, fish accounts for about 55% of the total animal protein intake of the population, and in rural areas fish provides up to about 85% of the protein intake of the population. The Statistical Unit of MFAR in cooperation with the Department of Census & Statistics (Household Income and Expenditure Survey Reports) estimates that Sri Lankan households spend approximately 37% of their monthly income on food and beverages. Of this amount about 9% is spent on fish (typically fresh) and 4% on dried fish. Almost one third of the fish eaten in Sri Lanka is consumed in dried form. Assuming 500,000 households in Sri Lanka, estimated averages imply a domestic market demand for fresh fish in 2006 of LKR 4.5 billion (USD 42 million) and a demand of LKR 2.1 billion (USD 20 million) for dried fish in the same period.

4. Imports

About 20% of fish consumed annually in Sri Lanka are imported. In 2008 some 76,266 MT of processed fish, valued at LKR 12,521 million (USD 111 million) was imported into Sri Lanka, mostly from Thailand, Pakistan, India and the Maldives. Dried fish represented 43% by value of imports in 2008, and canned fish 33% (Tables 7 & 8).

Table 7: Imported Quantities of Fish and Fishery Products (MT)

Item	1983	1995	2000	2004	2005	2006	2007	2008	% of Total 2008
Maldive	840	3,371	4,317	5,241	5,542	5,583	3,651	3,082	4%
Dried Fish	10,345	44,799	50,550	37,842	44,608	44,750	48,092	44,863	59%
Canned	5,594	20,169	21,894	18,071	20,229	19,706	23,105	18,198	24%
Fish		4	468	4,595	4,912	6,539	10,846	8,602	11%
Others		4	112	1,535	1,293	804	462	1,502	2%
Total	**16,778**	**68,347**	**77,340**	**67,284**	**76,584**	**77,382**	**86,156**	**76,266**	**100%**

Source: Statistics Unit, Ministry of Fisheries and Aquatic Resources

Table 8: Value of Imported Fish and Fishery Products (USD - millions)

Imported Item	2000	2005	2006	2007	2008	% of Total
Dried Fish	39	29	44	51	50	43%
Canned Fish	19	23	27	34	38	33%
Fish	0	7	12	16	18	15%
Others	0	4	2	1	2	2%
Total	**68**	**71**	**93**	**108**	**116**	**100%**
LKR/USD EOY	*75.78*	*100.50*	*103.96*	*110.62*	*108.33*	

Source: Based on Custom Returns/ Statistics Unit - Ministry of Fisheries and Aquatic Resources
Table 5.5 in Fishery Statistics 2008 report; converted to USD using year-end exchange rate

Canned fish imported into Sri Lanka pays a special commodity levy (an import duty of LKR 45/kg and other charges) of LKR 85/kg. Canned fish is sold throughout Sri Lanka, but the hill country is the principal market. In a Colombo supermarket in July 2009 a 425 gm tin of tuna was selling at LKR 875, which equates to LKR 2,058/kg. Despite its high price canned fish serves a special need for households, where refrigeration is expensive or unavailable and storage space scarce. Simply catching or producing more fresh fish in Sri Lanka is unlikely to displace the majority of canned fish imports. The government has announced plans to open a fish canning factory in Galle as a joint venture with a New Zealand company (Sunday Observer, July 26, page 3). This could displace some imports, but some experts question the ability of a smaller scale canning operation in Sri Lanka to be price competitive with mega fishing and canning operations elsewhere in Asia.

Recent data suggest that Sri Lanka might have a better opportunity for displacing dried fish imports. Between 2000 and 2008 dried fish produced in Sri Lanka had risen from 33% to 49% of the total market share of dried fish (Table 9). The Statistics Unit at MFAR also points out that about 70% to 80% of dried fish is produced in the Northern and Eastern Provinces. However, to compete successfully with imports, it will require better handling, drying and packaging practices to be followed in the Eastern Province. Sri Lanka also imports fresh fish from the Maldives, Yemen and Thailand for export processing during "off-season" periods when supplies from domestic fishers are insufficient for processors.

5. Contribution to GDP

According to the 2008 Annual Report of the Central Bank, Sri Lanka's GDP in 2008 was LKR 4.4 trillion (USD 39 billion) in current prices. Fishing as a sector accounted for LKR 68 billion (USD 600 million) or 1.5% of Sri Lanka's 2008 GDP. Marine fisheries accounted for LKR 63 billion (USD 560 million), 1.4% of GDP and inland fisheries for LKR 4.4 billion (USD 40 million) or 0.1% of GDP. Historical figures show the fisheries sector contributing between 1% and 2% of the country's Gross Domestic Product (GDP), about the same as tea or rubber cultivation in recent decades.

Table 9: Supply of Dried Fish

Year	Local Production of Dried Fish (a)	Imported Dried Fish (b)	Total Dried Fish	Local Production as % of Total
2000	24,360	50,550	74,910	**33%**
2004	25,390	37,842	63,232	**40%**
2005	7,560	44,608	52,168	**14%**
2006	33,400	44,750	78,150	**43%**
2007	36,200	48,092	84,292	**43%**
2008	42,380	44,863	87,243	**49%**

a. Annual Estimates
b. Customs returns

Source: Statistics Unit - Ministry of Fisheries and Aquatic Resources

6. Exports

In 2008, about 20,600 MT of fish caught in Sri Lanka were exported. That quantity represented 7.5% of the total marine catch for 2008, and 9.1% of the marine catch including fish for smoking and drying. The fish exported in 2008 earned USD 176 million in foreign exchange, which amounts to about 2% of Sri Lanka's total export earnings in that year. Sri Lanka's exported fish, although only 7% by weight of the annual catch, it accounted for 29% of the sector's contribution to GDP in 2008.

The largest category of fish exports (mostly tuna) reported in the Fishery Statistics 2008 is classified simply as "Fish" for USD 136 million (77% of all fish exports). A report prepared by the Ceylon Chamber of Commerce for "Seafood Expo 2005-2006" provides more information about exports by customs categories. In 2006 Sri Lanka's total fish exports were USD 139 million. The top six exports for that year were:

Herring – USD 21 million; all to the EU
Shrimp and Prawns – USD 19 million: Japan (68%) and U.S. (25%)
Frozen Fish – USD 34 million: EU (70%) - Germany, France and U.K.
Fresh Chilled Tunas – USD 12 million: Japan (76%), U.S. (10%) and U.K. (9%)
Other fresh/chilled fish - USD 11 million: EU (84%) – France (46%) and U.K. (28%)

Other fish exports in 2006 included live ornamental fish exports (USD 8 million), crabs (USD 2 million) and sea cucumber (beche de mer - USD 1.4 million). The main markets for Sri Lankan fish exports are the European Union (45%-60%), Japan (20%-35%), and the U.S. (6%-7%). Sri Lanka also exports high quality prawns, crabs and fresh fish to Singapore and Hong Kong especially at festival times. The export trade is entirely in the hands of the private sector. Over the period 2000-2008, fish exports from Sri Lanka increased significantly (Table 11) in volume and value from 18,554 MT valued at LKR 10.32 billion (USD 129 million) in 2000 to 20,594 MT valued at LKR 19 billion in 2008 (Tables 10 & 11). Sri Lanka enjoyed a positive balance of trade in the value of fish and fish products in 2008 with exports exceeding imports by about LKR 6,556 million (USD 60 million).

Table 10: Export Value of Fish and Fishery Products (USD million)

Exported Item	2000	2005	2006	2007	2008	% by Type
Prawns	67	18	19	22	10	**6%**
Lobsters	2	3	3	3	4	**2%**
Crabs	2	4	2	5	6	**4%**

Exported Item	2000	2005	2006	2007	2008	% by Type
Beche de Mer	2	3	1	4	3	**2%**
Ornamental Fish	8	8	9	8	9	**5%**
Chank & Shells	1	1	1	1	2	**1%**
Shark Fins	4	2	1	1	1	**1%**
Mollusks	0	1	1	2	3	**2%**
Fish	50	63	97	123	136	**77%**
Others	1	5	5	3	3	**2%**
Export Value USD MM	**136**	**106**	**139**	**173**	**176**	

Source: Based on Custom Returns/ Statistics Unit - Ministry of Fisheries and Aquatic Resources; Table 5.2 Fisheries Statistics Report 2008

Table 11: Quantities of Fish and Fishery Products Exported (MT)

Item	1983	1990	1995	2000	2005	2006	2007	2008	
									% on Total
Prawns	1,720	1,855	2,781	4,855	1,800	1,837	2,023	854	**4.1%**
Lobsters	207	165	283	164	183	168	184	249	**1.2%**
Crabs	n/a	n/a	898	554	1,012	568	1,151	1289	**6.3%**
Beche de Mer	56	36	248	87	258	153	208	180	**0.9%**
Chank & Shells	144	n/a	746	698	546	451	564	493	**2.4%**
Shark Fins	57	51	127	119	74	75	67	51	**0.2%**
Mollusks	n/a	1	51	15	300	106	713	1,460	**7.1%**
Fish Maws	n/a	n/a	1	1	1	1	1	1	**0**
Fish	209	821	1,978	11,873	10,960	14,301	15473	15,014	**72.9%**
Others			12	188	851	987	1,039	1,008	**4.9%**
Exported Quantity	***2,393***	***2,931***	***7,126***	***18,554***	***15,985***	***18,647***	***21,422***	***20,594***	***100%***

Source: Statistics Unit - Ministry of Fisheries and Aquatic Resources

The government has taken steps to support Sri Lankan fishery exports with programs to upgrade production, handling storage and processing systems to meet the standards/requirements of importing countries, particularly the EU. The Fish Products (Exports) Regulations of 1998 and the gazette by the Government of Sri Lanka under the Fisheries and Aquatic Resources Act No 2 of 1996 conform to the EU directives. In order to ensure enforcement of these regulations and the adoption of standard procedures by the exporters, the Ministry of Fisheries and Aquatic Resources (MFAR) has established a specialized unit (Fishery Product Quality Control Unit) managed by a Deputy Director. The Director General is the competent authority empowered to issue health certificates for exports of fish and fishery products from Sri Lanka. All exports, particularly those intended for the EU countries, must have this certificate.

Despite the relatively untapped potential of Sri Lanka's exclusive economic zone, most experts believe Sri Lanka would be at a disadvantage trying to compete in the global market for low-value "commodity fish". The large, established fishing fleets and processing facilities in other countries enjoy important advantages of scale and established market access. In addition, those same fleets and processors are now struggling with declining yields – possibly caused by overfishing. It is unlikely that Sri Lanka would be able to sustain the volume of fish or shrimp production needed to compete effectively in global markets with countries such as Thailand, India, Indonesia, and Ecuador.

Sri Lanka has therefore concentrated with some success on developing niche markets. Sushi grade tuna is one example of a high-value niche market. Another fish category recently developed by a Sri

Lankan exporter is large (U-5/U-10), fresh, unfrozen cultured freshwater prawns, which is a high-value aquaculture product shipped in small quantities by air to the EU.

Niche markets are typically served with low volume, high value products; quality and freshness are prized, critical attributes. Because of the price premium placed on freshness and the smaller volumes involved, shipment is typically by air freight rather than sea. Exporters of perishable products such as fish and fresh-cut flowers are requesting the Government of Sri Lanka (and Sri Lanka Airlines) for more and better cold storage facilities and expedited export processing at the Bandaranaike International Airport.

Ornamental Fish

In 2008, Sri Lankan firms exported USD 9 million worth of ornamental fish, up from USD 7.2 million in 2005. The Ornamental Fish Exporters Association of Sri Lanka (OFEASL), along with other exporters of fresh and perishable products (cut flowers, edible fish) has asked the government to help expedite the export process and to provide better storage facilities at the Bandaranaike International Airport as well as facilitate more flights to exported countries. Although this is a growing component of fish exports, the potential for private sector involvement in the Eastern Province is considered very limited because: the Eastern Province is in the dry zone, in which the GoSL does not encourage the conversion of paddy fields for other businesses; and the EP is far from the country's sole international airport (over seven hours by small truck). Also the domestic market in the EP for ornamental fish is limited owing to the generally low income levels of the population. Potential producers in the East would need to obtain permission from farmer organizations to use water drawn from reservoirs. Although a talented entrepreneur might find a way to overcome these obstacles, this report does not proceed further to examine the potential for ornamental fish in the Eastern Province. Daily News, July 16, 2009, page i.

Of the three major global importers of Sri Lanka's fish, – Japan, the EU, and the U.S. - only the EU is served by direct flights from Sri Lanka, while trans-shipments (which greatly increase the vulnerability of live and fresh products) are needed to reach the U.S. and Japan. This limits the diversification of export markets for live products (ornamental fish) and of fresh products (tuna). An improved air service will increase Sri Lanka's ability to compete in niche seafood markets.

This concludes the overview of resources and existing scale of activity in the fisheries sector. The following sections include a review of important actors and development activities ongoing in the sector and an examination of the Value Chain for strengths, weaknesses, opportunities and threats (SWOT). The final sections examine challenges facing the Fishery sector development, especially in the Eastern Province with possible development interventions.

E. Key Development Actors and Activities in the Sector

1. Government – Inland Fisheries and Aquaculture

The government, as far back as 1970, realized the importance of expanding production in inland waters. A crash program for the construction of fresh water and brackish water breeding stations and the recruitment and training of aquaculturists was launched in 1975. Carp species from the Peoples Republic of China - grass carp (*Ctenopharyngodon idella*), silver carp (*Hypothalmichthys molitrix*) and big head carp (*Aristichthys nobilis*) - were introduced to the country. In fact, most of the fish breeding centers were established during this period.

A five-year master plan for fisheries development, implemented from 1979 to 1983, laid much emphasis on developing the fish production in inland reservoirs and tanks. A separate division was set up in the MFAR for inland fisheries development in July 1979, and a program was formulated to accelerate the development of inland fisheries and aquaculture.

Remarkable progress was achieved as a result of the successful implementation of the program. In 1981/82 the Indian carps - Rohu (*Labeo rohita*), Mirigal (*Cirrhinus mirigla*) and Catla (*Catla catla*) - were introduced. The production of inland fish more than doubled during the period 1979–1983 from 17,425 MT to 36,068 MT. Fingerling production increased from 3 million to 7 million and a comprehensive fish breeding and distribution program was put in place. The facilities at nine fish breeding centers were upgraded and four more new centers were established along with three centers purely for extension purposes. The staff required was recruited and trained, and over 1,900 fishing boats were issued to fishers under a 90% subsidy scheme. Pond fish culture was launched under a 50% subsidy scheme and aquaculture in seasonal tanks firmly established. Cage and pen culture trials were also started with the assistance of International Development Research Centre (IDRC) Canada.

Even though there was no national fisheries development plan for the period 1984-1990, the accelerated pace of development continued during this period. The achievements of these seven years included the production of inland fish reaching a peak of 39,721 MT in 1989, the issuing of 2,500 fishing crafts under the subsidy scheme, the increase of fingerling production to 9 million and the expansion of the seasonal tanks aquaculture program to cover 204 tanks with a production of 432 MT. The expansion of facilities for fingerling production and training of core staff continued with support from the ADB which funded the Sri Lanka Aquaculture Development Project.

A tradition of pond aquaculture does not exist in the country. The pond culture is confined to culture of shrimp *Penaeus monodon* in brackish water ponds, distributed on the inter-tidal and supra-tidal areas around the Chilaw lagoon, the Dutch canal, Mundel and Kalpitiya lagoons. Post larvae for stocking in these ponds are being supplied by over 70 hatcheries, mostly located along the seashore in the Ambakandawila area in the Chilaw District. The peak production from these farms was obtained in 1987. However, due to a series of disease outbreaks in 1988 and 1996, most of the large farms have closed down and over 50% of the total farm area is idle due to financial losses incurred by shrimp growers. The disease has recurred and persisted in spite of the rehabilitation of the Dutch canal that supplies water to most shrimp farms, which continue to affect farmers every year. At present, there are 437 authorized shrimp farms and many unauthorized farms in the Puttalam District.

Withdrawal of State Patronage to Inland Fisheries and Aquaculture

A sudden policy decision was taken in July 1990 by the Executive President of the country to withdraw state patronage to inland fisheries, and hence the proposals contained in the Fisheries Plan for development of this sub-sector were dropped, except for those relating to prawn culture and the ornamental fish industry. The Inland Fisheries Division was closed down and the staff retrenched. Its activities were handed over to the private sector, Fisheries Cooperatives and non-governmental organizations. However, the National Aquatic Resources Research and Development Authority (NARA) continued with its research activities in aquaculture and the Department of Fisheries of the Ministry of Fisheries looked after the regulatory and welfare functions of inland fishing.

In 1991, the Government leased out all the inland fish breeding stations. With that, all the activities like production of fish seed, stocking of water bodies, operation of incentive schemes and the extension works which were ongoing ceased to function. As a consequence, inland fisheries production declined from 39,721 MT in 1984 to 12,000 MT by 1994.

Policy Reversal

The Government which came to power in 1994 reversed the earlier government's policy decision and again declared aquaculture and inland fisheries a priority area for development under its National Fisheries Development Plan 1995-2000. In line with the new policy the inland fisheries and aquaculture development efforts picked up gradually, the breeding centers were taken control of by the government, the production of fingerlings was stepped up and recruiting and training of staff commenced. In 1998 fingerling production, reached 1.25 million and total inland fish production 29,900 MT.

The National Aquaculture Development Authority (NAQDA)

The Six-year Fisheries Development Program (1990-1996) also formulated an organizational reform to establish a National Aquaculture Development Authority (NAQDA) as one of the strategies. NAQDA was established on January 29, 1999 under Act 53 of 1998. It is the core agency for the development of inland fisheries and aquaculture and is responsible for carrying out the Ministry's policy. NAQDA is presently organized into five divisions: (i) Administrative & Finance; (ii) Freshwater Aquaculture Development; (iii) Aquaculture Enterprise Development Planning & Monitoring; (iv) Aquaculture Extension and Training; and (v) Coastal Aquaculture and Mariculture Development. It has a total staff of 255, including 82 technical personnel and received an annual budget of LKR 110 million (capital expenditure LKR 47 million and recurrent expenditure LKR 63 million) in 2007.

2. Government – Marine Fisheries

Ceylon Fisheries Corporation (CFC)

The Ceylon Fisheries Corporation, also known as "CEYFISH" or CFC is a government-owned company that commenced its commercial operations in 1965. At its inception, CFC came under the purview of the Ministry of Industries & Rural Development. Subsequently the Corporation came under various other Ministries until the formation of a separate Ministry for Fisheries in 1970. CFC's original objectives and activities included:

- Deep Sea fishing operations
- Fish processing (canning, drying and processing)
- Production of fish byproducts
- Distribution and sale of fish on a wholesale and retail basis
- Import and export of fish and fisheries products
- Import and sale of fishing gear
- Construction and maintenance of fisheries harbors
- Fishing boat construction
- Providing repair and maintenance facilities for fishing boats
- Manufacture and sale of fisheries equipment

However, with the formation of the Fisheries Ministry in 1970, the Ceylon Fishery Harbors Corporation in 1972 and the Cey-Nor Foundation in the latter part of the "Seventies", many of the

above activities which were carried out by CFC, were devolved to these Institutions. At present CFC's core activities are:

- Purchase and sale of fish
- Production and marketing of ice
- Provision of cold storage and processing facilities
- Production and sale of fishery byproducts

In the 1980's CFC commenced the production of fish fillets at its factory complex in Minneriya using tilapia (fresh water fish variety) as its input. This facility still continues to produce filleted fish in packets for the consumer market. After the tsunami of 2004 CFC received aid from a number of donors, including aid to build two containerized ice plants and 2 containerized cold rooms in Trincomalee, 1 ice plant in Batticaloa and 2 containerized ice plants in Kalmunai, one of which is leased to a cooperative for LKR 50,000 per month.

CFC operates 58 retail outlets that sell fish directly to the public. CFC's policy is to maintain a reasonable buffer stock – purchasing fish when prices are low and releasing to the market when prices are high, helping to stabilize prices over time. CFC handles about 1.5% or less of the current volume by value of the fish sold within Sri Lanka and operates at a financial loss. Its staff of 750 persons and other running costs total LKR 30 million per month. With an average gross mark-up on LKR 50/kg, CFC needs a throughput of 600 MT of fish each month to cover its costs, but is currently averaging only 8 MT per day. CFC is in the process of reorganizing operations to lease out ice plants and sell its two multi-day boats. Also CFC has reached an agreement with a group of European companies to begin importing about 25 MT/day of cold water fish (haddock/cod) for processing and re-export to the EU. The EU companies will provide equipment and training for the workers.

Other Government Agencies Involved in the Sector

Apart from MFAR and NAQDA, other agencies which are involved in the sector include NARA, Industrial Technology Institute (ITI), National Institute of Fisheries and Nautical Engineering (NIFNE), Ceylon Fisheries Corporation (CFC), Agrarian Development Department (ADD), Mahaweli Authority of Sri Lanka (MASL), Fisheries Cooperative Societies (FCS) and a number of Non-Governmental Organizations (NGOs).

NARA is the research arm of the MFAR. ITI is working in the field of fish product development. NIFNE is an academic institution offering a range of courses in fishery science, aquaculture, marine and aquatic engineering. CFC is mainly in the business of marketing fish and fish products. ADD is chiefly concerned with the provision of institutional organizational support to small farmers/fishers in rural areas. MASL has a Fisheries Program aimed at developing the tanks and fish ponds under its area of authority. FCS provides service and support to fishing communities in the area of small-scale credit, employment generation and welfare activities.

The Sri Lankan fisheries sector has been the recipient of external assistance from various bilateral and multilateral agencies. The multilateral donors include the ADB, The Food and Agricultural Organization of the United Nations (UN/FAO) and the United Nation Development Program (UNDP). Bilateral donors include the Australian Council for International Agricultural Research (ACIAR), Canadian International Development Agency (CIDA), Danish International Development Agency (DANIDA), European Union (EU), GTZ[3], Japan International Cooperation Agency (JICA), Korean International Cooperation Agency (KOICA), Norwegian Agency for International Development

[3] GTZ – International Cooperation Enterprise for Sustainable Development

(NORAD), British Overseas Development Administration (ODA), International Fund for Agricultural Development (IFAD) and the Swedish International Development Agency (SIDA). These agencies have provided financial assistance to the fisheries sector in the form of loans, technical assistance, grants and regional cooperation projects. GTZ is funding a small pilot project for pen and cage aquaculture of Sea Bass in Batticaloa. In addition, some of the national universities such as the University of Peradeniya, Jayawardenapura University and University of Kelaniya offer programs relevant to fisheries and aquaculture.

The Export Development Board (EDB) is the focal point of export promotion in Sri Lanka and has been a significant help to exporters of marine products. EDB assists fish processing plants to implement Hazard Analysis Critical Control Point (HACCP) standards offering cost-sharing grants on a 50-50 matching basis. Currently EDB registered exporters include 115 exporters of ornamental fish and 46 exporters of tuna, 28 of which are approved for exports to the EU, 18 of which are exporters without their own plants. EDB is also working on a project to upgrade 50 smaller fishing vessels in Kalmunai to utilize long-line fishing for tuna with onboard holds for ice and is allocating LKR 25 million (USD 22 million). EDB has no information on rejection of fish exports by importing countries. That data along with other INFOFISH data is handled by the Ministry of Fisheries.

3. INGOs

A number of INGOs are active in providing services and support to fishing communities similar to that of FCS. Among them are World Vision which assists fisheries and fisher communities with various training and empowerment programs including microfinance. After the ***tsunami*** many INGOs provided assistance to the fisheries sector in Sri Lanka, by giving boats, fishing gear and housing. Total fishing craft in Sri Lanka have risen 32% from pre-tsunami numbers according to the Fishery Statistics for 2008. Approximately 10,000 craft have been added to the active fleet since 2004. Most of the new boats (42%) have been fiberglass reinforced plastic boats with outboard engines, not suitable for multi-day fishing. Another 23% were motorized traditional boats. Only 12% of the new boats were multi-day boats with inboard engines. But those 1,288 new multi-day boats represented a 78% increase in the fleet of multi-day boats in Sri Lanka.

4. Donor-Funded Agencies and Activities

The Aquatic Resources Development and Quality Improvement Project (ARDQIP) 2003-2010

The largest active donor-assisted project in the fishery sector currently is the ARDQIP project. The government, with financial assistance from ADB, commenced implementing an Aquatic Resource Development and Quality Improvement Project (ARDQIP) to further the development of inland fisheries and aquaculture. It is a USD 30 million investment project that began in May 2003, with a project duration of seven years. The development goal of the ARDQIP is to improve food security and reduce poverty in rural areas by promoting market-driven sustainable management of inland fisheries and development of aquaculture in the country. At present, it is being implemented in seven Districts in six Provinces in Sri Lanka.

The Ministry of Fisheries and Aquatic Resources is the executing agency for the ARDQIP Project, and NAQDA is the lead implementing agency. Other agencies responsible for implementing project activities include: (i) National Development Trust Fund (NDTF), as co-financier for the micro credit; (ii) National Development Bank (NDB), as apex bank for the delivery of credit for small and medium enterprises; (iii) private sector partners, who will work with NAQDA to establish inland fisheries and aquaculture projects; and (iv) the University of Peradeniya, which implements the fish health laboratory.

The envisaged outputs of the ARDQIP are: (i) to enhance fish production through community based managed systems (10 tanks every year from 2004); (ii) to utilize minor perennial reservoirs for fish culture (2000 ha every year from 2004/05); (iii) to utilize seasonal tanks for fish culture (600 ha every year from 2004/05); (iv) to establish mini nurseries (25 mini nurseries by 12/2007) (v) to design and install a fisheries data collection and information system; and (vi) to support self regulation of fishing efforts by communities (in at least 50 reservoirs).

The aforementioned activities are ongoing and keeping to the set targets. In addition by now the following accomplishments have been made: (a) the rehabilitation/expansion of aquaculture development centers; (b) the establishment of a water quality monitoring laboratory at Bangadeniya; (c) regional extension offices at Anuradhapura, Monaragala, Ampara and Bingiriya; (d) an Inland Fisheries and Aquaculture training institute at Kalawewa; (e) a center for aquatic animal disease diagnosis and research at the University of Peradeniya; (f) a model tissue culture lab at Rambodagalla; (g) a farm for Artemia culture and cysts processing at the Lanka Salt premises at Hambantota and Palatupana; (h) a milkfish breeding facility at Pitipana; (i) a grow-out facility for fresh water prawns at Pelwehera Dambulla; and (j) a fish drying/smoking model units at Inginiyagala, Udawalawe and Hakwatunaoya.

The construction of the NAQDA headquarters building at Battaramulla and a state-of-the-art central fish market complex, with 148 stalls for wholesale and 136 stalls for retail, a 25 ton flake ice plant, 3 cold rooms and a silage plant at Peliyagoda are still ongoing. As part of capacity building of NAQDA, the ARDQIP supported the participation of NAQDA officers in various local, as well as overseas, training programs. The input of ARDQIP has led to the production of 6.7 million fingerlings comprising 4.9 million carps and 1.8 million tilapia fingerlings from aquaculture development centers in 2008 (Table 9). The Inginiyagala Center is located in the Ampara District and serves the three Districts in the Eastern Province. From 2007 to 2008 production of carp fingerlings rose 34%, while production of tilapia fingerlings rose only 6%.

Table 12: Fish Seed Production in Aquaculture Development Centers – 2008
(LKR '000)

Center	Carp			Tilapia	
	Post larvae	Fry	Fingerlings	Fry	Fingerlings
Udawalawe	26,330	6,884	1.,189	4,050	1,053
Dambulla	35,104	16,051	2,131	2,152	290
Inginiyagala	28,800	9,675	1,468	2,830	430
Nuwara Eliya	820	383	139	0	0
Total 2008	**91,055**	**32,993**	**4,927**	**9,033**	**1,772**
% Increase from 2007	**41%**	**41%**	**34%**	**50%**	**6%**

Source: NAQDA

With ADB funding and the continued implementation of ARDQIP, inland fisheries and the aquaculture industry are experiencing rapid growth and contributing to government efforts to alleviate poverty in rural areas. Except for the Inginyagala seedling center, the Eastern Province obtained relatively little direct benefit from the ARDQIP, due to the civil conflict that prevailed during most of the project implementation period.

5. Private Sector Associations and Activities

All fishing vessels are privately owned, as are prawn farms and the majority of processing plants, ice plants, hatcheries and nurseries. CFC, which owns some ice plants, has begun a policy of leasing to private sector operators. The private sector handles all exports and imports of fish and fisheries

products. A high percentage of processing plants (90% - 95%) have achieved HACCP standards and certification.

There is a Seafood Exporters Association of Sri Lanka (SEASL) and Consortium for Development of Aquaculture, but these associations do not have a web-presence. Most private sector exporters are listed in the Export Development Board's trade directory of Sri Lanka export businesses; www.srilankabusiness.com. There is also a Federation of Prawn Farmers and Exporters of Sri Lanka that is less active since the closure of many prawn farming operations.

INFOFISH

Through the Ministry of Fisheries, Sri Lanka is a member of INFOFISH, www.infofish.org. INFOFISH was launched in 1981 as a project of FAO of the United Nations. Since 1987, it is an intergovernmental organization providing marketing information and technical advisory services to the fishery industry of the Asia-Pacific region and beyond from its headquarters in Kuala Lumpur, Malaysia. Fourteen countries are currently members of INFOFISH including Bangladesh, Cambodia, India, Indonesia, Iran, DPR Korea, Malaysia, Maldives, Sri Lanka, Pakistan, Philippines, Papua New Guinea, Solomon Islands and Thailand. INFOFISH is the leading source of marketing support for fish producers and exporters in the Asia-Pacific region which includes some of the largest fishing nations in the world. Its activities include bringing buyers and sellers together, publication of current and long-term marketing information and operation of technical advisory and specialized services. In addition to organizing exhibitions, conferences, workshops, seminars and training programs, INFOFISH undertakes consultancies on all aspects of fisheries - pre-harvest, harvest and post-harvest.

There are also a number of ornamental fish breeders and exporters associations such as the Ornamental Fish Exporters Association of Sri Lanka (OFEASL) that are active, and are advocating that the government provide better facilities and "one-stop" document processing for export of live fish.

3. Value Chain Analysis

This section presents key findings about the Sri Lanka fishery sector in a value-chain format, highlighting findings that are important to fishery sector development in the Eastern Province. Additional detail can be found in the earlier sections of the report. This section ends with a simple value chain map for the Fisheries Sector.

A. Key Findings

1. Primary Products

Primary products are fish and shellfish, from marine and fresh water fisheries and from aquaculture. Total fish production in 2008 was 310,000 MT; 275,000 MT (86%) of marine-caught fish, and 44,000 MT (14%) of inland fish. Investments in the sector should take into account the sustainability of yields. In the opinion of many analysts the coastal shelf is already being fished to its maximum sustainable yield. The government of Sri Lanka has stopped supporting expansion of smaller "day-boat" fishing and is encouraging investment in multi-day boats and conversion of day-boats into multi-day vessels. There is a season to fishing in Sri Lanka based on the annual monsoons that favor the East Coast for some months (February to April) and the South Coast during other months (August to February). This seasonality means that the East Coast enjoys a comparative advantage in marine fishery production for part of the year.

2. Primary Markets

The primary market in Sri Lanka is domestic. Ninety three percent of fish production in 2008 was sold domestically, while 7% was exported. Major buyers are the EU (45% - 55%), Japan (20% - 30%) and the U.S. (6% - 7%).

3. Primary Producers

Primary producers are fishers from marine, brackish water and fresh water sources, collectors of shellfish and seaweed, as well as growers of fish and shellfish. In 2008 there were 202,000 persons nationwide employed as fishers in Sri Lanka, 171,000 (85%) as marine fishers and 31,000 (15%) as inland fishers. Most of Sri Lanka's fishers use "one-day" boats and fish the coastal waters. There are more than 1,000 multi-day boats using the East Coast as their home base. In understanding Sri Lanka's success in exporting 7% of the fish it catches, it is important to note that the TESS Group of Companies operates a fleet of 96 leased long-line vessels and a carrier/tender vessel that fish in Sri Lanka's EEZ and also in the international waters south of Sri Lanka. Tess's offices are in Negombo, and its fleet operates out of the Mutwal harbor – part of the port of Colombo.

B. Value Chain Participants – Eastern Region

1. Producers

Active marine fishers in the Eastern Province in 2008 numbered 70,280, 41% of the national total: 21,704 in the Ampara District; 24,840 in the Batticaloa District and 23,700 in the Trincomalee District. In addition, the Eastern Province accounted for 19% of all active inland fishers: 2,170 in the Ampara District; 2,260 in the Batticaloa District and 1,480 in the Trincomalee District. Altogether, the Eastern Province, which accounts for only 8% of Sri Lanka's total population, is home to more than 41% of all marine fishers. These Eastern fishers used 34% of the country's marine fishing craft and, in 2008, they caught 28% by weight of all the marine fish caught in Sir Lanka. Another 5,900

fishers live inland in the Eastern Province and earn some or all of their income catching fresh fish from inland reservoirs or tanks. Inland fishers in the Eastern Province represent 19% of all the inland fishers in Sri Lanka, and produced 19% of all "inland" fish produced in 2008.

The number of active fishers in the three Districts of the Eastern Province (70,280) has risen 32% from the 53,200 fishers in 2004. The total number of fishing boats in the Eastern Province increased 32% from 31,169 in 2004 – before the tsunami to 41,733 in 2008. This increase helps explain the 131% increase in marine catch from the East between 2006 and 2008. The statistics alone cannot explain why the numbers of fishers are growing faster than the population of the Province, but two possible explanations are (a) lack of other employment opportunities and (b) the widespread offers of free boats after the tsunami by so many INGOs and relief agencies. Although the overall catch from the Eastern Province has increased in recent years, the average annual catch per fisherman in 2008 (1.6 MT per fisher) was appreciably below average, compared to catch estimates from 2000 (2.2 MT per fisher). Conclusions based on a simple comparison could be wrong, however, it may be due to severe restrictions placed on fishing in Trincomalee for all of 2008. However, the high number of people apparently entering the fishery sector as a profession is probably not sustainable and should be a cause for concern among development professionals, given the relatively low productivity of the sector and possible problems with the sustainability of the resource base. It would be better for the fishers and for Sri Lanka if more fishers are able to leave the profession and move into more productive economic activities.

2. Consolidation, Collection and Assembly

The exact number of consolidators, collectors and assemblers working in the Eastern Province is not known. What is known is that representatives of boat owners or wholesale buyers meet the fishing boats at landing points, pay the fishermen in cash and take the catch to the market. Very few fishers outside of the cooperatives actually own the fish they catch. As an indication of the numbers of large wholesalers in Sri Lanka, the new central market at Peliyagoda outside Colombo is being designed with 146 wholesale stalls. The number of stalls in the Trincomalee fish market built by USAID is 47. Fish collected and not sold right away at a landing point are transported to the local fish markets, operated by municipal or provincial governments. Surplus fish are shipped to urban markets, typically going first to Colombo's wholesale market, (St John's Fish Market (SJM) in Pettah that will eventually be replaced by a new central market in Peliyagoda in 2010. A fleet of more than 40 Isuzu 3-ton refrigerated trucks traveling from the East, relatively new, was seen at SJM in August 2009 working, both the wholesale and retail transport links and possibly indicating increased activity. Officials in Trincomalee report that on occasion fish caught outside the District are transported into an area when the local catch is too low to meet local demand, indicating a distribution system that works reasonably well.

3. Processors

Fish

There are relatively few processors of fish in Sri Lanka. The Export Development Board lists 26 processing plants approved for export to the EU. Most plants are located on the Western coast, closer to the port of Colombo and the country's only international airport. Newspapers in July 2009 carried announcements of a new fish canning operation in Galle. The Ceylon Fisheries Corporation has entered into an agreement to process fish for export to the EU. High quality tuna caught on the East Coast is transported to Colombo for processing or export. There are stories of very high grade tuna being flown from Trincomalee to the Bandaranaike International Airport in Colombo.

Prawns

Processors of prawns frequently send a member of their own staff to be present at the harvesting point or landing place to ensure that the weights, counts and quality are correct. Most prawn

processing plants are located in the Colombo-Gampaha-Negombo areas, where prawn cultivation was a major activity in Sri Lanka prior to problems with viruses. As of 2009, all but a few prawn farms and processors have closed, due to the decrease in the prawn harvest.

The few processors that remain open are located in Negombo in Western Sri Lanka. There are 90 prawn farms (approximately 45 ha) operating in Oddamaveda in the Batticaloa District. In addition, there are a number of abandoned prawn farms in the East, including Batticaloa that closed more because of war related hostilities than viruses. These could be re-opened. Currently, however, most prawns processed in Sri Lanka are marine prawns caught by special ocean trawling vessels. In 2008, 1,170 MT of prawns were caught in Batticaloa, 400 MT in Kalmunai and an unknown amount in Trincomalee (low but not recorded). Most prawns are processed and exported frozen, however a small quantity of the highest value (largest and freshest) prawns are exported fresh.

4. Supporting Suppliers and Service Providers

The post harvest portion of the value chain is supported by suppliers of electricity, water, ice, oxygen (for ornamental fish), refrigerants (for freezing and storage of frozen products), packaging material and transportation services, also by banks and other financial services (micro-credit) and communications services. Most of these are provided by private sector operators. Fishery Statistics for 2008 reports 389 fish landing sites in the Eastern Province but fewer than a dozen ice plants. Fishery Statistics for 2008 reports that in 2005 there were only 5 ice plants in the Eastern Districts, of which 3 were not operating. However since 2005, the number of working ice plants may have increased as a result of post-tsunami rehabilitation assistance. A major part of the price of ice is the cost of transporting it. The CFC, which operates the six ice plants on the East Coast reports that it is looking to lease the loss-making plants to a private sector operator. By one estimate, none of the six ice plants is operating profitably.

C. Policy Environment

Until July 2007 the most significant policies affecting fishing in the Trincomalee District were security restrictions imposed on fishing activities. All boats were required to leave and enter the harbors, anchorages and landing sites during daylight hours only. No fishing was permitted during the night. In some areas the use of engines in boats is not permitted and the distance from shore at which fishing can take place is limited. Fishing was not permitted when a Navy convoy was passing through the area. Multi-day vessels had to enter and leave the harbors and anchorages during daylight hours, but were not restricted in respect to where they could fish. As of mid 2009, these restrictions were in the process of being relaxed or removed.

On the land side security check points have been set up on the roads leading from the East Coast to Colombo and regional cities. Trucks carrying fish are stopped and may be required to unload their cargo for inspection before it is reloaded. Time is lost, while multiple handling for unloading and re-loading can have damaging effects on the quality of the cargo. These checkpoints are still in place, although loading and unloading is not required as often. Still these checkpoints add significant delays (more than 1-2 hours) to an already lengthy cross island travel time of 8 hours. Other important government policies affecting fisheries include:

- Government decision to encourage expansion of deeper fishing by multi-day boats
- A Special Commodity Levy (SCL) or tariff on imported canned fish equal to LKR 85/kg in 2008
- Government owned airlines and cold storage facilities at the country's only international airport
- Government policy restricting licensing on foreign fishing
- Government investment in expansion of aquaculture

In the realm of finance and credit, generally, banks and other financial institutions are unwilling to finance the fishing industry, which they consider high risk because of uncertain cash flows and lack of good collateral. Although a significant amount of new equipment (boats and nets) entered Sri Lanka in the year following the tsunami, little attention has been paid to credit needs. Until recently, there has been no government program targeting the credit needs of entrepreneurial fishers. On August 11, 2009, government officials announced the opening of the 7th branch of the Lankaputhra Development Bank in Batticaloa, along with special Small and Medium Enterprise (SME) loan and leasing schemes for fisheries and livestock enterprises (*Daily News*, Business section, page ii, August 11, 2009).

1. Value Chain Map for Sri Lanka

Appendix A depicts an elementary Value Chain Map for the fishery sector in Sri Lanka. The linkages between the various elements in the Fisheries Value Chain were found to be functioning normally, with the exception of weaknesses in the supporting facilities such as ice, refrigerated storage, transport, banking and credit. This could be due to lack of entrepreneurs in these sectors or due to the constraint that the local domestic market is not that demanding (will not pay more) for international quality cold chain practices. A limited amount of contract buying has been undertaken by Colombo-based supermarkets recently. The sections below provide some specific information on active value chains in the fishery sector in Sri Lanka.

2. Value Chain Governance and Power Relations

While no extreme concentrations of power within the fishery value chain were found, it was noted that the balance of economic power lies with the boat owners and truck-owning fish traders, who are sometimes one and the same. Frequently fishers are in debt to either boat owners or buyers. To ensure that a project's benefits intended to reach fishers and fishing families, actually do so, will require careful project design considerations, such as working through cooperatives or NGOs, or using carefully constructed partnerships with private sector firms that will offer fair terms and 'gain-sharing' for workers and entrepreneurs that introduce better practices.

Processing for export is also relatively concentrated, and this value chain, although constrained by the relatively small scale of Sri Lanka catch and exports, holds out more promise of generating benefits for small and medium scale fish and prawn cultivation. But the requirements and skills here are more demanding than most people realize. There are significant up-front capital costs in technical equipment and higher annual costs to operate using best practices. Even well-capitalized firms can lose an entire crop to a virus, something that would bankrupt a thinly capitalized SME. In their annual report for 2008, the Malwatte Valley Plantation PCL reported losing their entire crop of tilapia in 2008, due to unusually cold weather (Daily Mirror, July 16).

Project design should also take into account the relatively low status of fishing as an occupation. Fishing is not considered a desirable career path for young people. Until recently, young men were able to join the Army and enjoy higher social status compared to fishing. Although fishing pays competitively during good seasons, many fisherman lack budget management skills and good savings habits that leave them vulnerable to lean periods. During lean periods, boat owners or traders frequently advance needed funds that then result in less-than-arms-length payment for fishing work in the next season.

D. Key Findings Regarding Competitiveness

1. Outlook for Export Markets

Surplus marine fish (and inland fish) from the East coast are already being transported to Kandy and Colombo markets and are being sold in wholesale markets. Fish, prawns and lobsters are of sufficient high quality and are being consolidated and processed for export, but the volumes are small (less than 7% of total catch nationwide).

Despite the current downturn in global demand and trade, the longer term outlook on global demand for fish remains strong. The price of many ocean species continues to increase with demand and slow growth in supply attributed to overfishing. In export markets, however, fish and fisheries products from the project target area must compete with fish and fisheries products from other countries, especially those in the region (India, the Philippines, Taiwan and Thailand), as well as other exporting countries, worldwide.

Sri Lanka does not operate a fleet of ships fishing in international waters, and currently its fish catch is relatively small compared to global giants like Thailand, Taiwan, Japan and South Korea. The domestic catch sells easily in the domestic market, albeit at lower prices than it would command in export markets. Fish caught on the East Coast are not well handled and best practices in cold chain management to preserve value are not in wide use. Currently, Sri Lanka as a whole lacks the volume and economies of scale to be globally competitive in the large-volume "commodity fish" or canned fish sectors. Strategically, however, Sri Lanka can and does compete internationally in exports of several varieties of fish, mainly fresh, but also processed and frozen. These include high-value tuna, other large and small marine fish, prawns, crabs (fresh and frozen) and bech de mer. Sri Lanka's exports in these categories are relatively small, but they do meet international standards. Prawns have had problems with viruses in recent years; and 2008 exports were down 50% from 2007. The most promising commercial strategy for Sri Lanka is to continue to develop and compete in these "Niche markets" for high value items. Potential niche markets that Sri Lanka should consider developing are pond or cage-cultured live sea bass, live grouper and crabs (see report "Assessment of Aquaculture and Inland Fisheries").

2. Outlook for Domestic Market

In the domestic market it is generally true that except during periods of glut all the fish that is caught can be sold without significant delay or waste. According to MFAR Fishery Statistics of 2008 a significant portion (29% in 2008) of the domestic production consists of small, low value fish for "Drying or Smoking." Still, domestic fish production is insufficient to meet national demand for dried or canned fish, and 63,000 MT of dried (45,000 MT) and canned (18,200 MT) fish were imported to supplement domestic supplies. In 2008 imports of dried and canned fish represented a 20% addition to locally produced fish. Initially the increased fish catch from the North and East will most likely be readily absorbed by the domestic market even if there is some downward pressure on prices. Annual increase in the urban population and a revival of tourism to the island will also help strengthen demand for high-end fish. Increased output of fresh fish from the East will not reduce imports of canned fish, but may reduce imports of dried fish to some extent.

Without more export avenues, however, there is a strong possibility that increases in fish production in the Eastern Province will not result in significant improvements in the incomes or economic prospects for fishers of average or below average productivity. Major increases in fishing activity and productivity in the North and East in the absence of growing export outlets could lead to a short-term increase in local supply larger than can be absorbed by normal growth in domestic demand. Without more canning and drying facilities on the island, the increased fresh catch is unlikely to displace the imports of dried and canned fish. Temporarily retail prices could fall. This

could help increase average consumption of fish, but it could also translate into lower unit prices paid to fishers. Fishers who are able to increase their productivity by more than the decline in unit prices will still benefit, of course, but less productive (poorer) fishers working only the inland coastal waters might see their earnings reduced for a period. While domestic demand for fish will grow over time and revive unit prices, the longer run challenge will be to increase productivity in the sector, which will mean fewer, more productive fishers in the sector resulting in fewer employment opportunities for one-day fishers.

4. Recommendations for Fisheries Development

This section covers general recommendations for developing the fishery sector mainly in the Eastern Province, but also nationally.

There are five major challenges facing the marine fishery sector in Sri Lanka. The challenges are interrelated and need to be addressed as a package for the sector to develop its competitiveness and earnings potential in a sustainable manner. Together, the government and private sector have to address and solve these challenges.

1. Protect the sustainability of the country's marine resources

The EDB website for fishery opportunities says that a study of catch levels and landings indicate that fishing in the nearby coastal waters of Sri Lanka is nearing its maximum sustainable yield, about 250,000 MT per year. The same website suggests that Sri Lanka's Exclusive Economic Zone (EEZ) could yield another 100,000 MT per year sustainably. Updated scientific surveys are needed which can be used to guide government policy. Sri Lanka does not permit foreign fishing in its EEZ, but offers from the major fishing fleets of the world will soon become more frequent and more lucrative. Other countries that have agreed to license fishing in their waters by foreign fleets have regretted doing so. With or without licensing, protecting the marine resources in a country's EEZ can be an expensive proposition requiring capital investment in monitoring technology and enforcement. Sri Lanka's Navy, veterans of successful efforts to intercept smuggling, is better equipped and experienced than the navy in many countries, and the President has recently mandated a consolidation of "maritime" protection functions under the navy.

2. Invest in a modern "cold chain" for high-value fish that can be exported

This is an investment that has to be made in anticipation of the actual increase in fish exports. Fortunately entrepreneurs in Sri Lanka are already developing niche products for export to the EU, Japan and other markets that are pioneering and applying the best practices in post harvest handling and cold chain management. As the leading supermarket chains in Sri Lanka expand their operations, including procurement of fish from the East, better cold chain management practices will spread. This is an area that will generate employment opportunities for fishers leaving the producer link of the value chain.

3. Export more fish

Opportunities for high-value exports have been mentioned in this report. The consultants are also aware of attempts to export lower-priced, but popular varieties of inland-farmed fish (frozen) to the Persian Gulf countries to feed workers. Sri Lanka might not have the comparative advantage of volume in that market, but fish that had been processed with special Sri Lankan spices might have a competitive advantage – at least with Sri Lanka/Indian workers in those countries.

4. Encourage and enable fishers who are also entrepreneurs to invest in their own productivity

Part of the stagnation in productivity in the fishery sector can be traced to the fact that few fishers own or have the means to improve their own fishing productivity. Boats and equipment are owned by businessmen (Mudalalis), as are the trucks. There are important exceptions, in particular the fishery cooperatives. Some of these are also entrepreneurial – willing to invest in new technology to increase productivity.

5. Assist less productive fishers to leave fishing for other occupations

The Eastern Province accounts for 8% of Sri Lanka's population but 41% of its marine fishers. The development challenge facing the sector is to find better employment opportunities for the less productive of these fishers, who will need to leave the sector to those who are more productive. Unfortunately the number of active fishers in the Eastern Province grew at an average annual rate of 6.3% from 53,000 in 2004 to 70,000 in 2008, according the Fishery Statistics report for 2008 by MFAR. On a longer term basis this rate of increase in employment in the sector should probably not be sustainable by the resource base or the market. The productivity of fishing (average catch per fisher) has to increase for incomes of fishers to rise. That will be more likely with fewer more productive fishers working in the producer part of the value chain. Needed investments in other parts of the value chain such as post harvest handling, i.e. sorting, dressing, packing, ice storage, transport and cold chain management will create job opportunities that fishers can migrate into. Growth in tourism, recreational fishing, water sports, retail services and other sectors in the East will also contribute. Refer to the 2009 USAID/CORE report "Tourism Sector Assessment" for further details.

Meeting these challenges is crucial to the national fishery sector and to reconstructing a sustainable, competitive fishery sector in the East. More specific measures to help in the Eastern Province include:

- Removing restrictions on fishing times and locations for fishers in Trincomalee (This recommendation was written in May of 2009. The GoSL has since announced the lifting of restrictions in Trincomalee and in the North).
- Improving contacts and links between fishers in the East and entrepreneurial exporters (Colombo) of high-value fish.
- Encouraging use of long-line fishing for large species.
- Locating more processing units and undertaking more value addition in the East – sorting, grading handling fresh fish; drying and packing dried fish.
- Improving cold chain facilities and handling procedure from vessel to market, and replacing wooden boxes used in sorting and shipping with plastic crates (photograph – Appendix B).
- Enforcement of handling and sanitary regulations at markets. In general the level of sanitation, cleanliness and good handling practices at landing sites and fish markets are below standard. Often adequate regulations exist, but are not enforced.
- Supporting aquaculture, especially of species with high price export potential.
- Investing in multi-day boats.
- Developing a regional domestic airport in Trincomalee to serve the region.
- Providing better cold storage facilities at the BIA airport in Colombo.
- Expediting the documentation processing for fish exports.
- Offering vocational training programs to less productive fishers.
- Providing navigation equipment and training for ocean-going fisher vessels.
- Partner with fishing cooperatives and also with Colombo-based exporters to invest in initiatives that increase the value addition within the project area, such as:
    - Improving links to exporters based in Colombo,
    - Improving links to major hotel and supermarket chains,
    - Training fishers in techniques of long-line fishing for large fish,
    - Cold-chain facilities and management, and
    - Technical training on proper post-harvest practices.
- Assist women with activities related to sorting, handling of fresh caught fish, drying and packaging smaller fish. A pilot training program on simple, low cost packaging and labeling techniques tied to demonstrable economic benefits would be valuable (e.g., buy contracts from supermarket chain). NGOs or the Industrial Technology Institute of Sri Lanka are possible providers of training. A better idea might be to partner with leading supermarket

chains or a Sri Lankan company that is advanced in packaging (e.g., a spice company) and would be able to (a) provide the correct training and (b) offer to buy properly handled product.

- At present most is coming in bulk, some is being packaged. Work with families that own and operate drying stations. However, there is a question of reward for the extra effort.
- Train women in maintaining proper accounting to support the cooperative's business efforts.
- Partner with a telecom service provider to offer training in use of cell phones to order ice for landing points and to check market prices for fish species.
- Assist women and fishing families with financial advice about managing budgets, savings and insurance. Partner with financial institutions in the area. Train/advise fishers to manage their income and generate savings. Fishers are typically unable to save from the income earned during the season to cover their requirements when there is little or no income during the off season.
- Help a selected entrepreneurial fisher cooperative learn how to make contacts with and approach partners in the Colombo and Kandy about supplying high-value fish.
- Help fisher cooperatives with good market links have access to financing to make productive and safety investments such as long-lines to replace gill nets, GPS and fish finding equipment; plastic crates, ice making equipment, packing equipment, trucks and multi-day fishing boats.

6. Invest in Creating a New Value Chain for Fish Caught in East

If there is a cooperative in the East with sufficient aptitude and interest, there is opportunity to implement this concept - hand in hand with leading members of the selected fishery cooperatives. It would be a valuable learning experience in marketing and value addition. A team of consultants could help the cooperative to prepare a marketing package for potential buyers in the West. The team would help the cooperative prepare photos of prized fish, crabs, lobster along with tables about likely quantities that could be supplied and schedules that could be met. The cooperative leaders could be supported to make a marketing trip to Colombo with photos and some well picked and packed fresh samples. The delegation would visit (a) Colombo-based supermarket chains (b) active exporters, and (c) leading hotel chains. Another possible type of buyer might be spice companies, if they are willing to explore the possibility of marketing fresh or frozen fish that have been marinated in curries. At the very least this initiative will educate cooperatives about how to "compete" in a system currently dominated by middlemen and traders.

This initiative could be implemented with mainly local Sri Lanka marketing consultants – possibly one of the advertising firms with an interest in Corporate Social Responsibility (CSR). Expatriate consulting time would not be a critical requirement, but a tie-in with the Global Development Alliance (GDA) would help. The other direct costs would involve preparation of the presentation – photos, laptop or flip chart version, and cost of travel to Colombo for a week or two for the delegation. Results would be measured in terms of visits, contacts, expressions of interest and – with luck – orders and payments.

Entrepreneurial Training for Cooperatives

The Government of Sri Lanka offers a special training program for cooperative officials at the National Institute of Cooperative Development at Polgolla in Kandy designed to motivate and enable them to think and operate in a more business-like and entrepreneurial fashion. The training is an outreach to all cooperatives including fisher cooperatives. Also extension officers from the Ministry of Fisheries operate an "exchange" program that provides an opportunity for officials from selected cooperatives to work alongside officials from other cooperatives considered examples of good management practices.

7. Eastern Fisheries and Tourism

Except for the Arugam Bay area, there are few opportunities for recreational boating or fishing on the East Coast. The first boats to offer safe and attractive outings to tourists will probably be highly successful. This is an area where there can be an impact on development that extends well beyond the fishers and families that directly benefit. Initially, private sector, donors and others can create an introductory linkage between established adventure tourism operators in the West and entrepreneurial fishers in the East interested in future tourism development. Experienced fishers can make good guides to sport fishing grounds, whale or dolphin watching spots, and diving sites.

Making these contacts and introducing the concept that tourism offers alternative employment to fishing will also create a platform for dealing with possible future conflicts between tourism development and fisheries, for example overuse of beach frontage spots or harbor space. It would be helpful to build some positive linkages in advance of larger scale tourism development. This linkage would be an initial opportunity to explain the longer run value of tourism development in the East as a higher paying market for high-value fish and as a source of employment.

8. Selected specific opportunities in East for marine Fisheries

The following are a number of specific situations that could be opportunities for interventions and partnering. Among them are:

- **Crab collection in lagoons in Batticaloa -** Villagers in Kappalthurai and cooperatives in Langatura and Iralkuli harvest mud crabs with scoop nets and in traps using cattle offal for bait. The villagers tie their claws to maintain the crab as a live export from Colombo. According to the Directorate of Fisheries for the Provincial Council in Batticaloa, village crabbers earn LKR 200 to LKR 400 per kg. The crabs are sold to retailers in Colombo for LKR 1200 per kg to 1300 per kg. The Eastern Province was the source of 750 MT (41%) of all crabs consumed in Sri Lanka in 2008. This means crabs from the Eastern Province represent a USD 8 million annual industry in retail terms. This should be sufficient to attract more investors into the area and better practices. Currently there are very few traders buying the crabs. There is also potential at these margins for crab "fattening" in cages. The provincial council says grants are available for cages.

- **Grinding equipment to grind cockle shells in Kappalthurai, Batticaloa** - Village women are harvesting and selling the cockle meat but not deriving any benefit from growing mounds of cockle shells (photograph - Appendix B). The ground shells are reported to have a market as an ingredient for chicken feed, and it might be possible to increase incomes by connecting them with a potential buyer of chicken feed, who would lease a small scale grinder and pay them – above the lease amount – for the ground output.

- **Ice making and delivery in Trincomalee and Batticaloa -** Although there were numerous complaints about lack of ice, it was by no means clear that that there is a shortage of capacity to produce the quantities of ice needed for the boats and for distribution. An alternative and more likely explanation is that there is insufficient ice storage and transport, to facilitate making ice and ensuring availability at the places, quantities, and times needed. Few complaints were heard about the price, unless the ice had to be moved far. Ice is moved from ice plants in trishaws and laid on the sand in gunny sacks. The ice plants are not located very close to the landing points. If the fish catch exceeds the normal amount of ice waiting on the shore, there is not enough time to get more from the ice plant. Cell phones on boats might help alleviate this inefficiency. Captains could call in their ice needs as they are headed for shore.

9. Some Opportunities related to Aquaculture

A separate report has been commissioned to look at aquaculture and inland fishery opportunities. The following are presented as preliminary suggestions that need to be considered along with or as alternatives to possibilities in the marine fishery sector:

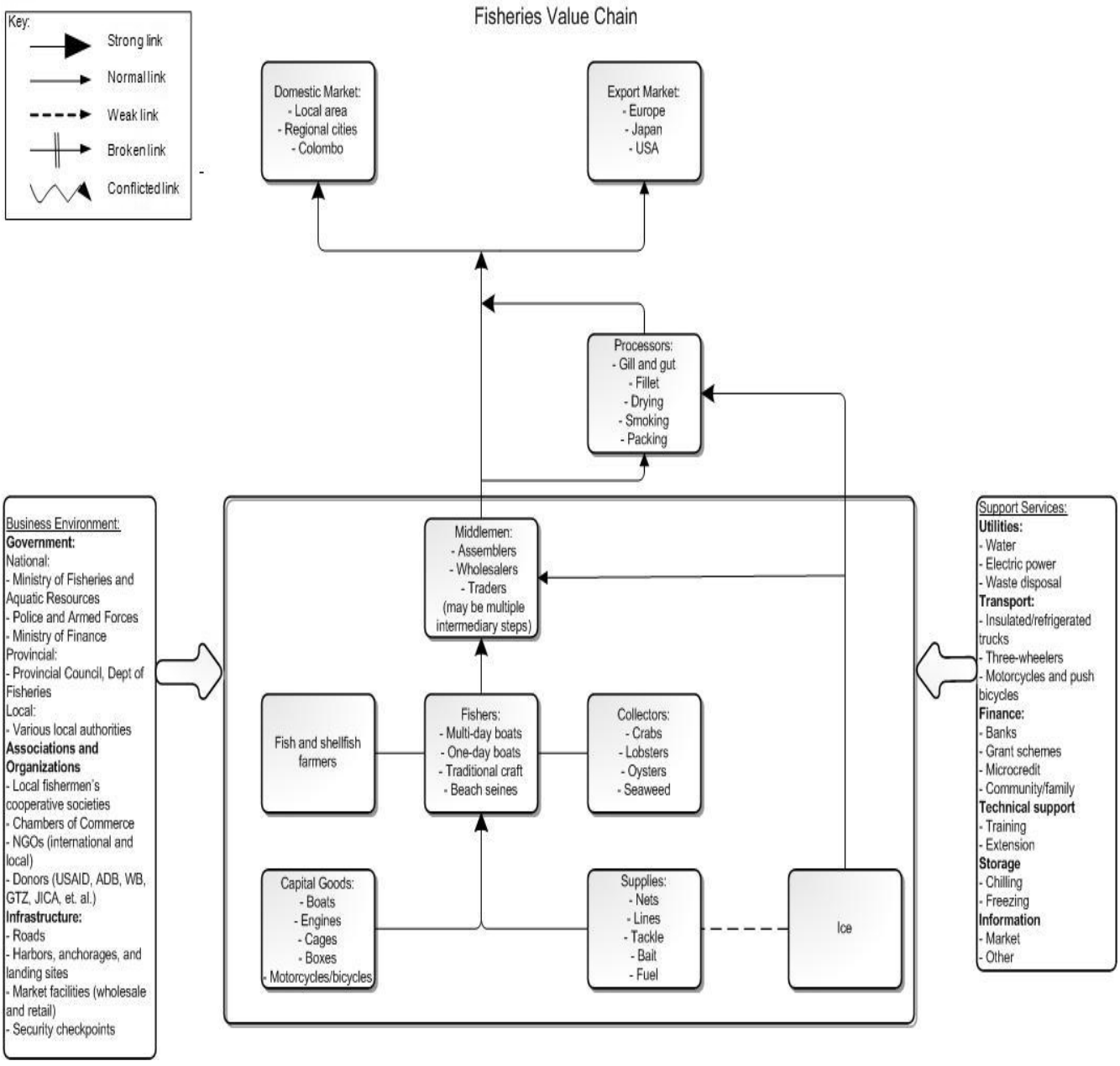
- Partner with entrepreneurs willing to expand the pen and cage system for fish culture in Eastern lagoons. The private sector has been reluctant to become involved in these activities, for reasons which can be expected to diminish with peace and a return to economic development. Technical obstacles will remain, however, since feed and materials required for cage and pen construction must be imported and are expensive, while domestic market prices are relatively low. Export possibilities and prices might make this a viable proposition; but fish grown in the East have to cross the island (8 hours minimum by road) to be exported. This will require complementary investments in cold chain transport. Further studies are needed to determine the feasibility of options to increase the profit margins to levels sufficient to attract and reward private sector investment in this area.
- Partner with entrepreneurs willing to invest in agar extraction from seaweed. A few families in Batticaloa are already collecting it and have been doing it for generations. Although the collectors are not forthcoming with information, they report that they collect and dry the seaweed on the shore and send dried by truck to Colombo.

Concluding Remarks

The principle short-term constraint that was adversely affecting the fisheries value chain in the project target area until July 2009 was the restriction on fishing activities in the Trincomalee District due to hostilities and security concerns. This constraint was relaxed and eventually removed later in the summer, as this report was being drafted. It is reasonable to expect a quick revival of the traditional fishing value chain in the East, which will continue to enjoy its season-based competitive advantage over fishing elsewhere on the island. However longer-term challenges to competitiveness and productivity of the sector are substantial and will require skill and commitment from both the government and private sector. In the short-term there are a number of promising opportunities for value addition based on connecting quality-conscious, higher paying buyers in Colombo (domestic and export oriented) with entrepreneurial fishers and other actors in the value chain in the East. Specific opportunities have to be explored in more detail; however the preliminary indications suggest that there are value-addition opportunities that will benefit beneficiaries in the USAID/CORE target areas.

Appendices

Appendix A: Value Chain Map



Appendix B: Photographs

Cockle collectors, Kappalthurai, Trincomalee

Wooden crates and poorly iced fish, Trincomalee

Sea Bass Cages, at Kinniya, Trincomalee

Mound of discarded cockleshells, Kappalthurai, Trincomalee

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