

## **FOREFRONT OF RECOVERY? A SUB -SECTOR ANALYSIS OF THE POST-TSUNAMI SEAFOOD EXPORT INDUSTRY OF SRI LANKA**

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### **ABSTRACT**

Tsunami catastrophe has had devastated ten main fishing districts of the country and which account for 72% of the marine landings. The tsunami affected areas are very important for commercial tuna fisheries and fish landings (except shrimp aquaculture), fleet operations and livelihood of fishermen. The purpose of this study was to examine the impact of tsunami on seafood export industry of Sri Lanka and to formulate the sub sector analysis for the sustainable livelihood of the stakeholders of the seafood industry. Drawing on questionnaire based surveys of 9 villages in 3 districts, the paper elucidates how fishers, traders and export-processors managing the post tsunami situation to the recovery. Human and social capital building capacities of the sub-sectors were in similar level. The physical capital status of the export-processors was better than the producers and traders while their financial capital access was poor. The damages to domestic fleet strength (about 75%) and poor demand on fresh fish were resulted slower rehabilitating of fishing operations and especially low tuna supply. The impact of shocks and trends had similar low figures for traders and export-processors but higher for producers while impact of seasonality was negligible compared with others. The changes of policies (100m buffer zone), institutions and processes (except scrapping the import duties) have little impact on export-processors compared to producers and traders. The damages to the Maldivian fleet operations have also badly affected to the tuna re-export, dry fish and Maldivian fish exports sector. Traders and export-processors have better livelihood strategies than the fishers. Export-processors in west, north-west coasts are operating in their full capacity to fill the supply gap while south coast is more focusing on one-day operating small fleets with long-line tuna fishery for export.

**Keywords:** Tsunami, Sri Lanka, sub-sector analysis, seafood industry.

### **INTRODUCTION**

Sri Lanka was one of the countries worst affected by the tsunami and devastated the entire fishing communities in south, east, and north coastal provinces. The impact of tsunami has been a heavy loss of lives, extensive property damage, and the loss of livelihood for fisher folk. More than 8000 fishers have been killed and over 5600 are still missing (Ministry of Fisheries, 2005). In addition to that more than 5000 fishing families have been displaced and 60% of the fishing vessels have been completely destroyed (19,000 boats) or very seriously damaged (Ministry of Fisheries, 2005). Ten out of the 12 main fishing harbors in the country have been completely destroyed including infrastructure such as landing sites, ice plants, cold storage, processing plants, trading vehicles, roads, workshops, and supportive research and extension institutions. The contribution of fisheries sector to the Gross Domestic Product is about 3% (Central Bank of Sri Lanka, 2004). But, entire coastal communities depending on it for their livelihood and as major source of protein. Sri Lankans are heavy consumers of fish and the average per capita fish consumption is 17 Kg/year (Ministry of Fisheries and Aquaculture, 2005). Nearly 55% of animal protein intake comes from fish and fish products. Therefore, Sri Lanka is heavy importer of fish and fishery products. Its production cannot fulfill its demand. Sri Lankan seafood export basket consisted of 22% of shrimp and prawn (Department of Customs, 2004) and the rest is consisting with tuna, shark fins, fish maws, crabs and mollusks. The impact of tsunami on shrimp aquaculture was negligible. Majority of shrimp farms are located in west and north-west coast were shielded by the high tidal waves. Unfortunately, tsunami had crippled the commercial tuna and large pelagic fisheries of Sri Lanka.

**Table I: Damage estimation of the fishing boats in southern Sri Lanka**

District	NO. of Vessels		Destroyed	Damaged
	Pre-tsunami	Post-tsunami		
Galle	1213	1253	578	463
Matara	1489	1367	728	349
Hambantota	1733	1597	1149	508

Source: Ministry of Fisheries and Aquatic Resources (2005)

**Table II: Human losses to the fisheries industry in southern province**

District	Dead	Missing	Displaced	Destroyed houses	Damages houses
Galle	61	11	2422	1163	590
Matara	331	35	1435	739	498
Hambantota	365	56	5100	614	1328

Source: Ministry of Fisheries and Aquatic Resources (2005)

Human and physical (boats and gear) losses in the research sites were described in table I and II. Southern coast is more important to the Sri Lankan economy, in terms of fisheries and tourism. Impacted areas included small fishing villages, towns, urban areas, and mixed communities where fishing villages were nested within more urbanized environments. The economic conditions of the villages along the coast are varied, leaving some communities heavily reliant on one industry while others relied on several.

This paper examines the major concerns and risks to livelihoods faced by fishing communities in southern Sri Lanka, after the tsunami disaster. The basic objective was to identify the impact of tsunami on seafood industry of Sri Lanka. The main focus was to formulate sub-sector analysis for the sustainable livelihood of the stakeholders of the seafood industry of south of Sri Lanka. In the following sections of this paper, a short background to the tsunami ravaged southern Sri Lanka is provided, including the description of damages, present situation, and recent policy measures. Next the methodology for this case study is outlined. Finally, the major findings from the sub-sector analysis and corresponding conclusions together with policy recommendations are offered.

## METHODOLOGY

This paper is based on surveys under taken during summer, 2005 in 9 villages of three districts of southern coastal province of Sri Lanka. The three districts were Galle (100Km from Colombo), Matara (150Km from Colombo) and Hambantota (220 Km from Colombo). Total average annual house hold income in Galle, Matara and Hambantota districts were 127 US\$, 105 US\$, 94 US\$ respectively in 2002 (Department of Census and Statistics, 2003). Moreover, percentage of population below the poverty line (Head count index %) in Galle, Matara and Hambantota districts were 26, 27 and 32 respectively (Department of Census and Statistics, 2003). The sampling frame was the affected population in 12 districts amounting to 1.15 million. Out of these three affected districts of south were purposively selected for the study. Research locations were selected on the basis of the damage caused by tsunami. Three representative villages were selected from each district. In Sri Lanka, Grama Niladari Division (GN division or village) is the smallest political unit and several GN divisions comprise a Divisional Secretariat Division (DS Division). Moreover, several DS divisions form a district. The stratified random sampling technique was used to select the respondents from each district, where fishing communities were divided into 3 main strata. The three main groups were producers, traders and export-processors. Thirty respondents from each stratum were selected. Ten respondents for each stratum from each district were selected to minimize the locational bias (table III describes the sample profile). The main data collection tool was the structured questionnaire. The questionnaire was consisted of five main parts, including the situation of capital assets (human, social, natural, physical and financial), vulnerability context (shocks, trends and seasonality of production), policies, institutions, and processors of the sector and livelihood strategies. A four point rating scale was used to evaluate the statements under the each sub-section of the questionnaire. Rating scales for positive statements were 3 - high, 2 - medium, 1- low and 0 - not at all and vice versa for negative statements. The approach to the field work was particular and based on quantitative methods. The questionnaire was administered to selected individuals of each stratum and interviewed individually. The SPSS 13.0 (SPSS Inc., 2005) statistical package was used for all analysis.

**Table III: Sample profile**

Measure	Producers/Fishers	Traders	Export-processors
Gender			
Male	30	28	29
Female	00	02	01
Marital Status			
Married	20	23	20
Single	08	3	6
Other	02	4	4
Education level			
Primary	10	06	00
G.C.E. O/L	10	12	06
G.C.E. A/L	08	08	13
Diploma	02	03	07
Graduate	00	01	04
Religion			
Buddhist	20	16	14
Muslim	09	12	08
Christian	01	02	08
Occupation status			
Permanent	27	26	19
Sporadic	03	04	11

(G.C.E. O/L=General Certificate Examination in Ordinary Level; G.C.E. A/L=General Certificate Examination in Advanced level) Source: Field survey July-August, 2005 in Sri Lanka

### **Theoretical concepts**

A combination of the Sustainable Livelihood Approach (SLA) and Sub-sector Analysis (SA) is providing analytical framework to examine the post-tsunami seafood export industry in Sri Lanka. Sub-sector analysis considers the large proportion of the population or group depends on one particular commodity, e.g. fish and fishery products (Kieih et al. 2003). Once the sub-sector and its participants were mapped out, the participants' livelihoods was studied using the SLA (Kieih et al. 2003). Each category of operator in SA analysis has several sub-categories such as producers: small and large scale; traders: wholesalers, middlemen and retailers; and export-processors: owners of the enterprise and employees. The aim of the SA is examine more closely at the changes that have taken place after the disaster, and to develop an understanding of how stakeholders have been affected and how they have adapted to or cope with them.

### **The sustainable livelihood approach**

The SLA is a way to understand the needs of the population and identify the key opportunities that will ultimately benefit the people (Kieih et al. 2003). Capital assets are resources that help people survive and thrive. The main capital assets are human, social, physical, natural and financial. Livelihood assets pentagon is used as a visual tool to present information about people's access to assets and the interrelationships (see figure1).

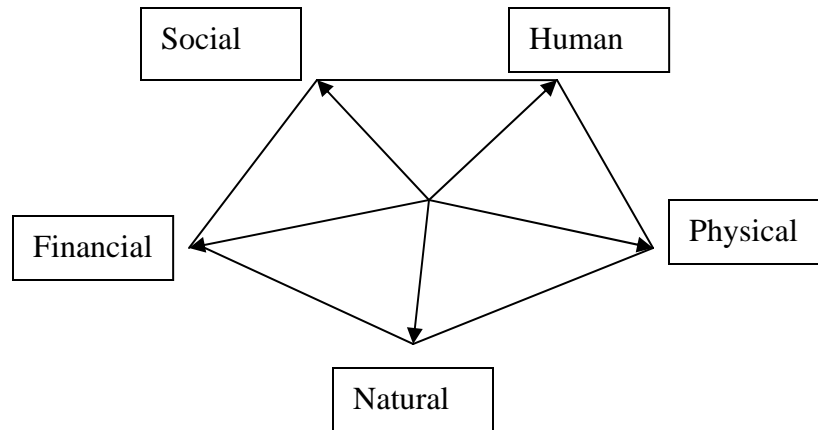


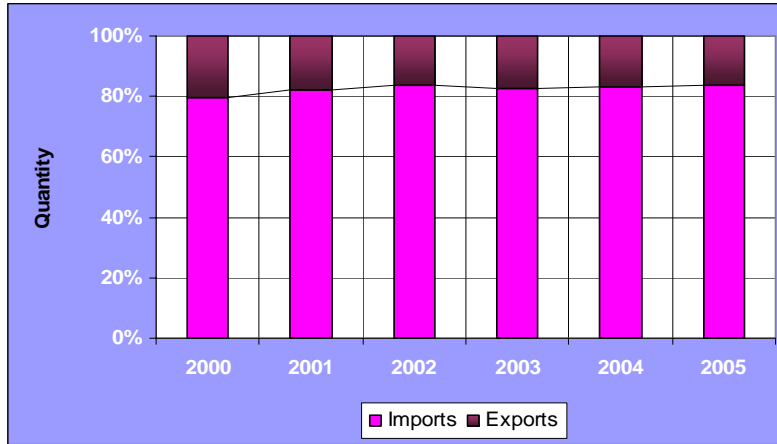
Figure 1. Livelihood asset pentagon

Human capital represents resources such as skills, knowledge, ability to work and good health. Good physical and mental health is very important after the disaster, for fishers to be able to perform fishing, processing and marketing. People are dependent on social resources for their livelihood strategies. Social resources are determined by relationships and networks, which exist within families, among communities and groups and social relations influence the way in which people can access and make use of assets (Kieih et al. 2003). Natural capital is the quality and quantity of natural resources that are available to people and the access and control over the natural resources (Kieih et al. 2003). Financial capital refers to the financial resources which are available to people and which provide them with different livelihood options (Kieih et al. 2003). Physical capital is the basic infrastructure such as transport, shelter, sanitation, water, energy and communications and the production equipment, which enable people to pursue their livelihoods (Kieih et al. 2003).

The vulnerability context helps to understand the impact of external factors on people's assets which make people poor or vulnerable. Shocks, trends and seasonality are three main concepts that are analyzed for the vulnerability context, e.g. introduction of new 100m buffer zone, establishment of new towns far from beach. Conservative sites were described as a shock. Moreover declining of fish stocks (especially, small shore seine varieties), fishing fleet, and decreasing demand for fresh fish were considered as trends. Seasonality includes recurrent changes throughout the year that influence people's assets and livelihood outcomes, e.g. tsunami devastated just before the main traditional fishing season, thereby catch was dropped by about 70%. Investigation of the influence of key stakeholder groups in the commodity chain on policies and the extent of access to institutions, e.g. fisheries cooperatives, export processing associations, provincial and urban councils and the judiciary. The livelihood strategies adopted, reflects the activities people perform and the roles they play as part of sub-sector, e.g. fishing, handling and grading, marketing, processing and export.

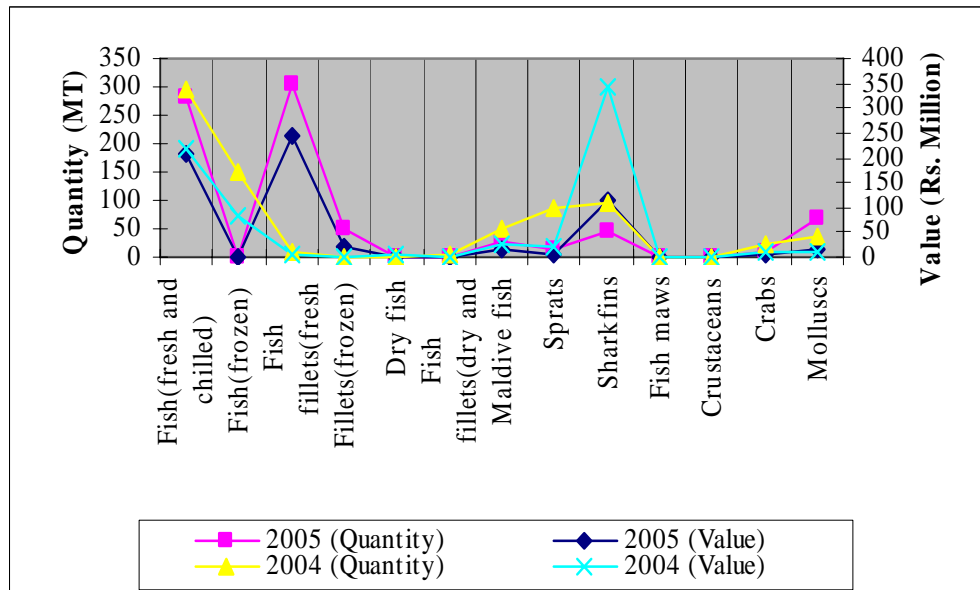
## Results and discussion

The field survey drawn in 9 villages in 3 districts provides the structure for the results and discussion. The more effective community capacity have been limited the disastrous impacts in lives of fishers, traders and export-processors and their property. Indeed, beyond the death and missing fishermen, traders and processors, the tsunami wrecked much of the community infrastructure including harbors, landing sites, jetties, roads, auction halls, fish markets, ice plants, cold storage, trading vehicle and processing plants. Tsunami devastated south and south-west coast were important for commercial tuna fisheries. The total figures of fish and fishery products exports were declined and composition of the export mix was changed. Especially, the exports of tuna, sward fish, and shark fins exports were dropped. Moreover, healthy exports figures were maintain through the shrimp production and Shrimp farmers are experiencing little improvement in production. Heavy damages of commercial vessels were not recovered yet. Shark-fin exports suffered from sudden drop in supply and not yet recovered well. Loss of market infrastructure leads to increase post harvest losses.



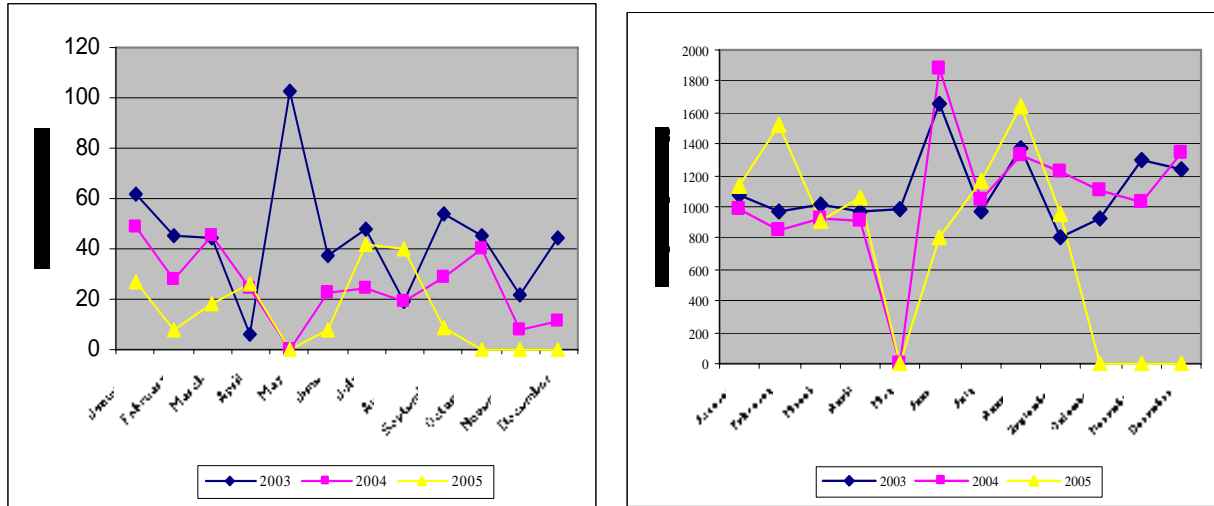
**Figures 2. Pre and post tsunami seafood imports and exports of Sri Lanka**  
 Source: Department of Customs, Sri Lanka

Figure 2 and 3 present the pre and post tsunami seafood imports and exports situation. Both exports and imports were declined. Poor economic conditions together with low purchasing power of the consumers lead to low demand for imported fish. In the meantime, canned and dried fish products were reached to the country in mass volumes as a part of food donations. Major portion (55%) of Sri Lankan fish imports consisted of dry fish (Amarasinghe, 2003). Domestic dry fish production was increased in northern and eastern provinces during the ceasefire agreement between government and rebels (started from 2003) and it lead to drop the imports in recent years. Fish prices in domestic market showed fluctuating pattern. Especially, the low demand for large pelagic species was resulted sharp decline of prices in both retail and wholesale market. In the mean time prices for small shore seine varieties and inland fish were increased. Small shore seine varieties are popular among rural people as a main provider of animal protein. More over supply drops will increase protein malnutrition problems among lower income groups. On the other hand many consumers refrained from consuming fresh fish. Due to low demand for the catch many fishermen in the study area have been not so enthusiastic on fishing operations and slower the rehabilitating efforts. This resulted in poor supply of fish in fresh, dry and frozen forms. Meantime, the price of imported dry and canned fish was increased about 20-30% in domestic market and the demand was very high (Subasinghe, 2005). Heavy imports of canned fish, dry fish and Maldive fish stocks were made big burden to the country's economy.



**Figure 3. Pre and post tsunami seafood exports of Sri Lanka in product basis.**  
 Source: Department of Customs, Sri Lanka

The damage to trawlers and large commercial fleets led to sharp decrease in tuna landings. Fishers of the southern coast have following different strategies to overcome the barriers during post tsunami period. One day operating long lines as a new strategy were used for tuna catches. Moreover, peaceful political environment of the north and east provinces were made fishing grounds open for fishing. Fish supplies from north and north-western provinces were help to smooth functioning of export market. This lead to continuous fresh tuna supply to Japanese market. Figure 4 shows the monthly trends of tuna exports to the Japanese market during 3 years time period. In generally, tuna catches were decreased during the months of November and December. Especially, after the tsunami catches were dropped sharply. Moreover, the prices were high during low catch season. In contrast, tuna prices were decreased last year sharply. Tuna processing industry is partly depending on the raw material supplies from Maldives. Moreover, severe damages to the Maldivian commercial fishing fleets were made poor raw material supply to Sri Lankan processors.



**Figure 4. Market analysis – Sri Lankan tuna exports in monthly basis to the Japanese market**

Source: Department of Customs, Sri Lanka

Sub sector analysis reveals that processors, traders and export-processors have similar but high figures of human and social capital (see table 4). Fishers, traders and export-processors in study area, were strengthening with skills and knowledge required for fishing, marketing and processing. E.g. placement of fishing grounds, judging weather conditions, seasonality, operating of boats and fishing gear, assess and maintaining the quality of fish, handling techniques, market information, processing techniques, etc. Especially, good mental and physical health of the all sub-sector participants is an essential requirement for involving in fishing, marketing and processing. Unfortunately, the tsunami has had badly destroyed their mental and physical health. Tables VI, V, VI and VII describe the descriptive statistics for the each sub- sample with the independent variables. Moreover, table IV shows the mean values of independent variables for each sub-sector.

**Table IV: Analysis of the livelihoods of sub-sector participants (Mean values)**

Variable	Producers/fishers	Traders	Export-processors
Human capital	6.17	6.43	6.43
Social capital	16.83	17.81	17.84
Natural capital	11.47	5.87	5.87
Financial capital	3.97	5.63	5.63
Physical capital	9.82	5.27	5.27
Shocks	2.72	2.67	2.67
Trends	2.14	2.63	2.62
Seasonality	1.37	1.84	1.83
Policies	2.87	2.47	2.47
Institutions	2.03	2.37	2.37

Processes	2.57	2.37	2.37
Livelihood strategies	1.23	1.83	1.83

Source: field survey, summer 2005.

**Table V: Descriptive statistics for the producers**

Variable	Minimum	Maximum	Mean	SD	Variance	Skew ness
Human capital	5.00	8.00	6.17	1.08	1.18	0.34
Social capital	15.00	20.00	16.83	1.28	1.66	0.23
Physical capital	10.00	14.00	11.47	1.19	1.43	0.28
Financial capital	3.00	6.00	3.97	0.96	0.93	0.56
Natural capital	9.00	11.00	9.8	0.76	0.58	0.36
Shocks	2.00	3.00	2.7	0.46	0.22	-0.92
Trends	1.00	3.00	2.1	0.61	0.37	-0.04
Seasonality	1.00	2.00	1.37	0.49	0.24	0.58
Policies	2.00	3.00	2.87	0.34	0.12	-2.27
Institutions	1.00	3.00	2.03	0.61	0.38	-0.02
Processes	1.00	3.00	2.57	0.63	0.39	-1.17
Livelihood strategies	1.00	3.00	1.23	0.50	0.25	2.15

Sample size is 30

**Table VI: Descriptive statistics for the traders**

Variable	Minimum	Maximum	Mean	SD	Variance	Skew ness
Human capital	5.00	8.00	6.43	1.00	1.01	-0.13
Social capital	15.00	20.00	17.8	1.24	1.54	-0.51
Physical capital	5.00	7.00	5.87	0.73	0.53	0.21
Financial capital	5.00	7.00	5.63	0.61	0.38	0.4
Natural capital	4.00	7.00	5.27	0.82	0.68	-0.16
Shocks	2.00	3.00	2.67	0.47	0.23	-0.74
Trends	2.00	3.00	2.6	0.49	0.24	-0.43
Seasonality	1.00	3.00	1.8	0.71	0.51	0.32
Policies	1.00	3.00	2.47	0.62	0.39	-0.76
Institutions	1.00	3.00	2.36	0.72	0.51	-0.69
Processes	1.00	3.00	2.37	0.67	0.44	-0.59
Livelihood strategies	1.00	3.00	1.83	0.69	0.48	0.24

Sample size is 30

**Table VII: Descriptive statistics for the export-processors**

Variable	Minimum	Maximum	Mean	SD	Variance	Skew ness
Human capital	5.00	8.00	6.43	1.00	1.01	-0.13
Social capital	15.00	20.00	17.8	1.24	1.54	-0.52
Physical capital	5.00	7.00	5.87	0.73	0.53	0.21
Financial capital	5.00	7.00	5.87	0.61	0.38	0.4
Natural capital	4.00	7.00	5.63	0.82	0.68	-0.16
Shocks	2.00	3.00	2.67	0.47	0.23	-0.74
Trends	2.00	3.00	2.67	0.49	0.24	-0.43
Seasonality	1.00	3.00	1.8	0.71	0.51	0.31
Policies	1.00	3.00	2.47	0.62	0.39	-0.75
Institutions	1.00	3.00	2.37	0.71	0.51	-0.69
Processes	1.00	3.00	2.37	0.66	0.45	-0.58
Livelihood strategies	1.00	3.00	1.83	0.69	0.24	0.24

Sample size is 30

Social assets are based on relationships and networks among the people. Informal social capital is used to achieve livelihood strategies of the people. The social relationships were severely damaged by the displacement of fishing communities by the disaster. Fishers, traders and export-processors were suffering from high level of social cohesion, and varying degree of community involvement in recovery activities. The social capital building was disturbed by mainly the displacement living in temporary camps, government policy issues on 100m buffer zone. Physical capital status of the post tsunami situation has improved for fishers but not for the traders and export-processors. Fishers got the first priority in rehabilitation process and the arrangements for providing daily necessities, housing facilities, fishing gear, boats and repair stations were made their status of physical assets better. Traders and export-processors had to face severe losses in physical resources. Moreover, the damages were huge in monetary terms compared to fishers. Unfortunately, the rehabilitation efforts were poor for them. But the physical capital status of the fishers has improving. The situation of the basic infrastructure is recovering in a slow phase. The rehabilitation of market infrastructure, including construction of harbors, landing sites, ice plants, cold storage, auction halls, municipal markets and purchasing of trading vehicles, were required huge capital investment. All these factors made the poor physical capital status of the traders and export-processors. Financial capital status of the fishers was low compared with others. Availability of financial resources, such as savings, supplies of credit in local level, banks, etc. were low during post tsunami period. In fishing communities, there is a preference for saving in kind as that is perceived as having higher value or being less risky than cash, e.g. gold and silver jewelry. Unfortunately these resources also misplaced or washed to the sea by high tidal waves. The daily expenses were covered by the monthly compensation scheme of the government, worth 50 US\$ and supplies of dry rations. Financial capital status of the export-processors was better than the others. Especially, having access to the banking facilities, financial institutions and support from overseas buyers and counterparts were made considerable impact on them. Natural capital status of the fishers was better compared to traders and export-processors. People living in fisheries, not only depend on fish but on a combination of natural resources for their livelihood. At the beginning, huge tidal waves were destroyed the coastal vegetation and people experienced bare land with salinisation of coastal fresh water bodies. After 3-4 months from the disaster, rapid growth of coastal vegetation with new plant types was experienced. The experiences of the people, stressed that the coastal soil became fertile. Especially, shrimp farms in western province were flushed by the tidal waves, experiencing the production growth.

Establishment of the 100m buffer zone has made big burden to all sub-sector participants on access to the land. Prior to tsunami, most of the coastal infrastructure related to fisheries and tourism industry was located close to the beach within the 100m zone. Shocks have similar impacts on all sub-sector participants. Tsunami and its' destruction were the biggest shock, that fisheries industry faced ever. Seafood industry experienced both negative and positive trends after the tsunami. The changes of consumer preferences for fresh fish in domestic market, pollution of fresh water resources, damages to coral reefs and declining fish stocks, high demand for imported canned and dry fish were the negative impacts. On the other hand, unlimited distribution of fishing boats and gear may cause for extra pressure on fish stocks and can be negative shock in long term. Export-processors were requesting from European Union nations



to scrapping 18% import tax on tuna as a mitigating measure. In the mean time European commission has proposed to accelerate the entry into force of the new European Union preferential trade regime for Sri Lanka and other developing nations and provides further tariff concessions for fishing products. Positive trends are lifting of import duties on seafood products (shrimp tuna), expansion of demand in international market and the heavy investment effort on market infrastructure. Impact of seasonality on fishers was less compared with traders and export-processors. The disaster occurred prior to traditional fishing season and resulted recurrent changes in fish landings (drop by about 70%). During post-tsunami period, fishers, traders and export-processors were unable to deal with trends and shocks, while seasonal changes were made fishers vulnerable. Policies and institutional changes made significant impact on fisher's livelihood. An introduction of 100m buffer zone made people away from the access of land (new government policy for the coastal resource management is 100m buffer zone with in city limits and 200m buffer zone for the rest of the coastal areas). Establishment of post-tsunami management council, boat and fishing gear repair stations, local organization's and Non Governmental Organizations are playing an important role in rehabilitation process. Traders and export-processors have better status of livelihood strategies compared to fishers. Fishers in west, north-west coast are operating in full capacity to fill the gap between the demand and supply. South and southwest cost are focusing on one-day operating boats for long-line tuna fishery as a new strategy. On the other hand government assistance on 19 feet, one day operating boats for long-lining will improve the rehabilitation process. Government, mainly the Ministry of Fisheries and Aquatic Resources (MFAR) planning to purchase the fish catch at deep sea. This will arrange facilities for fishers to stay long time in sea and increase the catch effort too. This programme plans to provide fuel and food for the fishers in sea.

Table VIII. shows the correlation among the variables of the sub sample of fishers. Where positive, significant correlations were exists between physical, financial and human capital. Natural capital had negative significant relationship with physical capital. Moreover social capital has negative, significant relationship with policies and institutions.

**Table VIII: Pearson correlation matrix of variables for fishers**

	Physical capital	Financial capital	Natural capital	Social capital	Institutions	Processes
<b>Human capital</b>	0.443*					
<b>Physical capital</b>		0.403*	-0.386*			
<b>Policies</b>				-0.439*		
<b>Institutions</b>				-0.384*		
<b>Shocks</b>					-0.445*	
<b>Seasonality</b>						-0.363*
<b>Livelihood strategies</b>						-0.543**

Correlation is significant at the 0.05 level (2-tailed) \*\* Correlation is significant at the 0.01 level (2-tailed)

Table IX presents the correlations between the variables of the sub-sample of traders. Social capital had negative significant correlation with financial capital and processors. In the meantime, Institutions had positive, high significant correlation with shocks. Livelihood strategies have negative high significant correlation with shocks. Impacts of natural disaster and the policy changes add big burden on the livelihood of people.

**Table IX: Pearson correlation matrix of variables for traders**

	Financial capital	Processes	Natural capital	Shocks
Social capital	-0.415*	-0.365*		
Institutions			-0.402*	0.467**
Livelihood strategies				-0.480**

Correlation is significant at the 0.05 level (2-tailed) \*\* Correlation is significant at the 0.01 level (2-tailed)

Between financial capital and physical capital, financial capital and human capital and seasonality and shocks had negative, high significant correlation (see table X). Shocks had positive, high significant correlation with natural capital and this was different from fishers and traders. Human and social capital had negative correlation with the policies.

**Table X: Pearson correlation matrix of variables for export-processors**

	Physical capital	Financial capital	Shocks	Policies
Human capital	0.633**	-0.605**	0.373*	-0.423*
Social capital		-0.392*		-0.422*
Physical capital		-0.628**		
Natural capital			0.514**	
Trends			-0.457*	
Seasonality			-0.510**	

Correlation is significant at the 0.05 level (2-tailed) \*\* Correlation is significant at the 0.01 level (2-tailed)

## COBCLUSIONS

Post-tsunami rehabilitation efforts started with the coast of tableau of battered boats. Beyond the death toll of fishers, heavy damages to the fishing fleets, gear, and market infrastructure made reconstruction efforts slower. Fish consumption was affected badly and the protein malnutrition problems of lower income groups will increased. Moreover, the increased consumption of imported canned and dried fish products made big burden to the country's economy. Recovery of the demand for fresh fish from the domestic market is important for rehabilitation of small-

scale fishers. Both imports and exports of seafood products were dropped and the composition of exports was changed. Exports of tuna and large pelagic species were declined. New strategy, such as one day operating long line tuna fishery, was helping to functioning of export market. Fishing vessel strength of the small scale fishers along the south coast were recovered with the help of donations and repairs. Moreover, huge capital losses of traders and export-processors were recovering in a slower phase. Sub-sector analysis was identified that overall capital building capacity of traders and export processors were better than the fishers. Policy changes and institutions have negative impact on fisher's social capital building. Processes have negative impact on social capital building of traders while policies have negative impact on export –processors' human and social capital building. Meantime, status of financial capital of export-processors has negative impact on human, social and physical capital building. Better livelihood strategies of export-processors help to rehabilitate faster compared producers and traders. Establishment of 100m buffer zone hinders the progress of reconstruction. Especially, fishers and traders are suffering from persistent uncertainty regarding when they would be able to resume their work. In the mean time, the distribution of relief packages is not being carried out properly because of bureaucratic hurdles and the corruption and clash among political parties.

According to the point of view of people, relief and rehabilitation efforts taken by government and non governmental organizations will be successful only if the affected community is allowed to participate in discussions and decision making process. Especially, the new town plans for devastated cities and shifting urban centers inside to the country alarming to disrupt the community networks and social bonds. Moreover, relief organizations have to taken into account the need of vulnerable sections of the affected community, such as women and children. Monitoring of rehabilitation work and formulating a “need analysis” become very important requirement of the hour.

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