

Consequences of the tsunami on fisheries and coastal livelihood: a case study of tsunami ravaged southern Sri Lanka

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Introduction

- Impact of tsunami:
- More than 8000 fishers have been killed and over 5600 are still missing
- 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
- 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.



Damages to the fisheries sector

➤ Loss of Income

➤ Total loss of income (annual)
= Rs. 1,886 million

➤ Total loss of income (daily)
= Rs. 5.19 million

(1US\$ = 103.25 Rupees)

➤ Drop in production

➤ Before tsunami = 255,000mt

➤ After tsunami = 73,000 mt

➤ We are now producing 28% less

➤ Drop in fish supply – consumers suffer (principal protein supplement in rural diet)

➤ Loss of employment

➤ Loss of employment (active fishers) = 45,128

➤ Auxiliary services = 225,640
(fish merchants, fish vendors, suppliers of fuel, ice, packaging, transportation, etc., fish processors, exporters)

➤ Loss of lives, dwellings and displacement

➤ Fishermen deaths = 7,200

**what is the social cost?
IMMENSE**

➤ Houses destroyed = 21, 330; Houses damaged = 9,486; displaced families = 61,654 and displaced persons = 233, 843



Devastated physical resources





Life in camp site





Rebuilding



Objectives

- @ To identify the impact of tsunami on seafood industry of Sri Lanka.
- @ To formulate sub-sector analysis for the sustainable livelihood of the stakeholders of the seafood industry of south of Sri Lanka.

Concepts

- ② Sustainable Livelihood Approach (SLA) and Sub-sector Analysis (SA) is providing analytical framework to examine the post-tsunami seafood export industry in Sri Lanka
- ② 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)
- ② Once the sub-sector and its participants were mapped out, the participants' livelihoods was studied using the SLA
- ② 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
- ② 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).

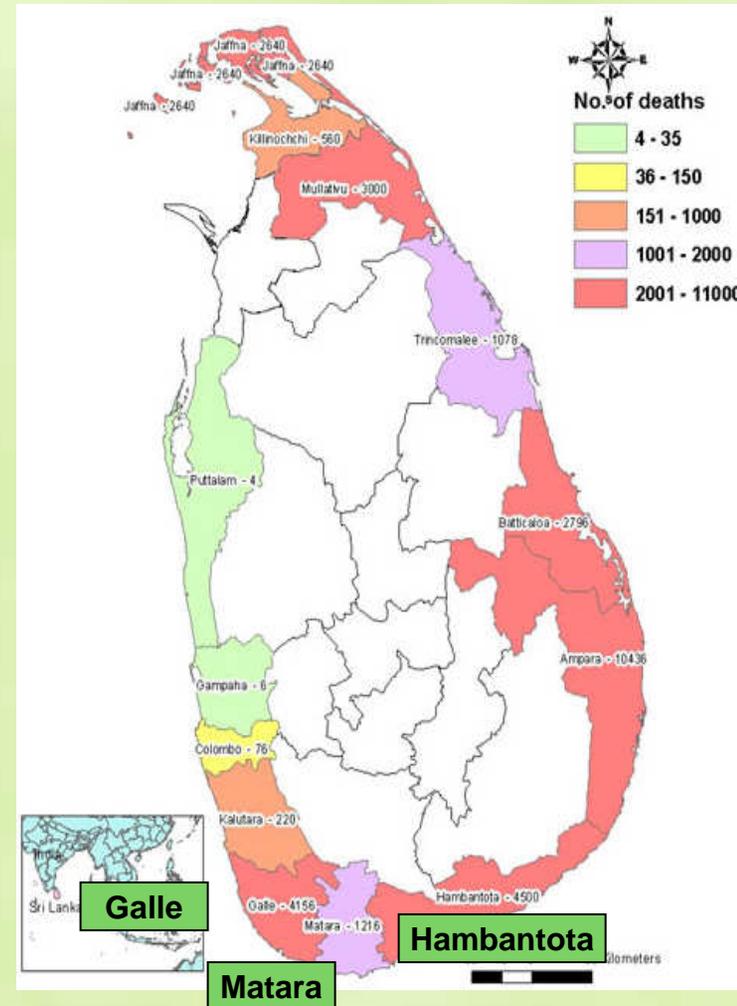
Sustainable Livelihoods approach

- ④ Capital assets are resources that help people survive and thrive.
- ④ Main capital assets are human, social, physical, natural and financial.
- ④ Livelihood assets pentagon is used as a visual tool to present information about people's access to assets and the interrelationships
- ④ **Human capital:** represents the resources such as skills, knowledge, ability to work and good health.
- ④ **Social capital:** 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
- ④ **Natural capital:** the quality and quantity of natural resources that are available to people and the access and control over the natural resources

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- ② **Financial capital:** the financial resources which are available to people and which provide them with different livelihood options
 - ② **Physical capital:** the basic infrastructure
 - ② **vulnerability context:** helps to understand the impact of external factors on people's assets which make people poor or vulnerable.
 1. **Shocks:** unpredictable events affecting livelihoods
 2. **Trends:** continuing tendency of external factors
 3. **Seasonality:** recurrent changes throughout the year
 - ② Influence of **policies** on key stakeholder groups in the commodity chain on policies
 - ② **Extent of access to institutions**
 - ② **Livelihood strategies** adopted, reflects the activities people perform and the roles they play as part of sub-sector

Methodology

- Research locations were selected on the basis of the damage caused by tsunami.
- Three representative villages were selected from each district
- 9 villages of three districts (Galle, Matara and Hambantota) of southern coastal province and carried out during summer 2005
- The sampling frame was the affected population in 12 districts amounting to 1.5 million.
- stratified random sampling technique was used to select the respondents from each district, where fishing communities were divided into 3 main strata.



- ② Three main strata were producers, traders and export-processors
- ② 30 respondents from each stratum were selected.
- ② 10 respondents for each stratum from each district were selected to minimize the locational bias
- ② Main data collection tool - the structured questionnaire.
- ② Questionnaire was consisted of five main parts, including the
 1. situation of capital assets
 2. vulnerability context
 3. policies
 4. institutions, and processes of the sector
 5. livelihood strategies
- ② four point rating scale was used to evaluate the statements under the each sub-section of the questionnaire.
- ② Rating scales for positive statements were 3 - high, 2 - medium, 1- low and 0 - not at all and vice versa for negative statements.
- ② The questionnaire was administered to selected individuals of each stratum and interviewed individually.
- ② The SPSS 13.0 statistical package was used for all analysis.

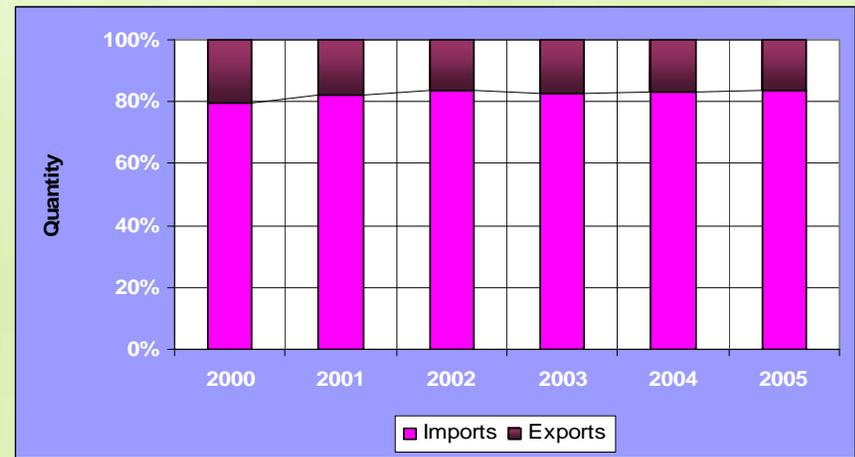
Sample profile

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

Results and Discussion

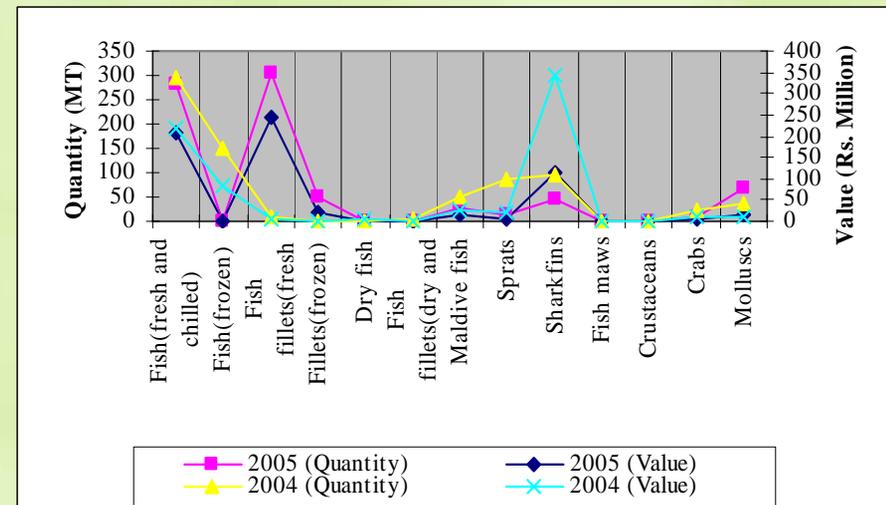
- @ More effective community capacity have been limited the disastrous impacts in lives of fishers, traders and export-processors and their property.
- @ Beyond the death and missing fishermen, traders and processors, the tsunami wrecked much of the community infrastructure
- @ south and south-west coast were important to the economy: Tourism and fisheries.
- @ Fish and fishery products exports were declined and composition of the export mix was changed; exports of tuna, sword fish, and shark fins were dropped
- @ Healthy exports figures were maintain through the shrimp production and the help of tariff concessions
- @ Both exports and imports were declined

- Ⓢ Poor economic conditions
- Ⓢ mass volumes of canned and dry fish products as a part of food donations
- Ⓢ Domestic dry fish production was increased in north and east
- Ⓢ Rumors of unsafe fish
- Ⓢ low demand for large pelagic species
- Ⓢ Increased prices for small shore seine varieties and inland fish



Pre and post tsunami seafood imports and exports of Sri Lanka

Source: Department of Customs, Sri Lanka



Pre and post tsunami seafood exports of Sri Lanka in product basis

Source: Department of Customs, Sri Lanka



Recovery Phase





Return to the sea



An analysis of the sub-sector participants (mean scores)

Variable (Possible Score)	Producers/ Fishers	Traders	Export- processors
Human capital (0 - 18)	6.17	6.43	6.43
Social capital (0 -27)	16.83	17.81	17.84
Natural capital (0 -12)	11.47	5.87	5.87
Financial capital (0 -18)	3.97	5.63	5.63
Physical capital (0 - 24)	9.82	5.27	5.27
Shocks (0 - 3)	2.72	2.67	2.67
Trends (0 - 3)	2.14	2.63	2.62
Seasonality (0 - 3)	1.37	1.84	1.83
Policies (0 - 3)	2.87	2.47	2.47
Institutions (0 - 3)	2.03	2.37	2.37
Processes (0 - 3)	2.57	2.37	2.37
Livelihood strategies (0 - 3)	1.23	1.83	1.83

Source: Field survey, summer 2005

Pearson correlation matrix for the Fishers

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

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

Pearson correlation matrix for the traders

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

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

Pearson correlation matrix for the export-processors

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

	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**	

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- Ⓢ Social relationships - severely damaged
 - Ⓢ Sub-sector participants were suffering from high level of social cohesion, and varying degree of community involvement in recovery activities
 - Ⓢ Social capital building was disturbed by mainly the displacement, living in temporary camps and government policy issues on buffer zone, urban development plans
 - Ⓢ Fishers got first priority in recovery plans- physical capital status better compared to traders and export-processors
 - Ⓢ Damages of traders and export-processors were high compared to fishers
 - Ⓢ Financial capital status and access to finance of traders and export processors are better
 - Ⓢ Financial capital status and access to finance of fishers were poor compared to traders and export-processors

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- ④ Destroyed the coastal vegetation
 - ④ Establishment of 100m buffer zone made big burden
 - ④ Tsunami and its' destruction were the biggest shock
 - ④ Negative impacts - changes of consumer preferences in domestic market, pollution of coastal fresh water bodies, damages to the coral reefs, adverse effects on shore base fish stocks
 - ④ Positive trends were lifting of import duties on seafood exports, heavy international poring of the donations for the investment of market infrastructure
 - ④ Impact of seasonality on fishers was less compared to traders and export-processors

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- Ⓢ Policies and institutional changes made significant impact on fisher's livelihood
 - Ⓢ Traders and export-processors have better livelihood strategies compared to fishers
 - Ⓢ **Why replace with same crafts and gear?**
 - Ⓢ Danger of over exploitation of coastal resources (likelihood of overestimation of crafts, engines and gear losses; danger of increased fishing effort on coastal fisheries)
 - Ⓢ Possibilities are now exists to shift some of the coastal fishermen to less-exploited offshore and deep sea sectors

Implications of the 100m buffer zone?

- ❑ Buffer zone will not provide protection against future tsunami
- ❑ This is coast conservation measure (1997 CCD plan)
- ❑ Miss-management will lead to social unrest
- ❑ Is it true fishermen has to live within the 100m zone or not?
- ❑ Yes – generations used to live in coast
- ❑ No – Not necessarily, if facilities to keep engines and boats provided and if access to beach is not made difficult (eg. Rekawa, Kalametiya, Godawaya)
- ❑ Non-fisher interests on beach

Conclusions

- ② Impact on fish consumption
- ② Composition of seafood export basket was changed
- ② Overall capital building capacity of traders and export-processors were high compared to fishers
- ② Establishment of buffer zone, resettlement plans, hinder the progress of reconstruction and threat to disturb generations old community bonds
- ② Bureaucratic hurdles, corruption and clashes among political parties were led to improper distribution of aids
- ② Rehabilitation process will successful only if affected community is allowed to participate in decision making process
- ② Relief organizations have to consider the needs of vulnerable sections of the affected community, e.g. women and children
- ② Monitoring of rehabilitation work is essential
- ② Formulating “need analysis” is very important for today



Thanks

