

Chapter 8

Assessing the Impact of Natural Disasters on Livelihood Sustainability: A case study on the Asian Tsunami and its Impact on Coastal Communities in Rekawa and Kalametiya

8.1 Introduction

Natural disasters can have an enormous impact on the lives and livelihoods of people at a regional, national and even international scale. At the household level, natural disasters can be a major shock that completely changes the ability of the household to maintain a sustainable livelihood system. This chapter is devoted to assessing the effects of natural disasters on livelihood sustainability, by studying the impact of the Asian tsunami on the communities in Rekawa and Kalametiya.

The December 2004 tsunami was a shock of unprecedented scale that affected my study site and thereby the communities and their livelihoods. It presented a unique opportunity to get an overview of the impact a shock of this magnitude had on the communities and gain a deeper understanding of how people coped in the aftermath of this catastrophic event, taking the baseline data available on the site (pre-tsunami) into consideration.

The broad objectives of this study were to first evaluate the usefulness of adopting a participatory approach combined with more conventional methods - similar to what was used during data collection Phase 1 and 2 of my research, to assess the impacts of natural disasters such as the tsunami on coastal livelihoods. And second to contribute to the policy debate on how best to address post-tsunami rehabilitation. It must be noted however that this piece of work captures the immediate aftermath of the tsunami and the preliminary relief/rehabilitation phase that took place in early 2005. The lessons learned therefore reflect the situation prevailing at that time.

8.2 Background

The Asian tsunami that hit Sri Lanka's coastal areas on the 26th December 2004 resulted in widespread destruction and will be recorded as probably the worst human tragedy to be caused by a natural disaster in Sri Lanka's long history³⁰. The tsunami was the outcome of a series of earthquakes, measuring up to 8.9 on the Richter scale that occurred in the sea bed near Sumatra in Indonesia. This was the fifth largest quake to be recorded in a century and impacted several countries in the Indian Ocean region.

In Sri Lanka, the tsunami first struck the eastern coast about 100 minutes after the earthquake. Overall over two-thirds of the coastline of Sri Lanka was affected by the tsunami. The complex interaction between water-borne energy, sea-bed and terrestrial terrain meant that the effects of the tsunami were different from place to place, but in general the eastern, north-eastern and south eastern coasts of the country were particularly badly impacted. The official death toll was estimated to be over 40,000 and in many cases entire families were swept away to sea. Of the fatalities, about 27,000 were of fishermen and two-thirds of the country's fishing boats were wrecked, destroying many livelihoods. The number of people displaced by the tsunami was reported to be approximately one million. The Sri Lankan Government declared a state emergency in all 12 coastal districts³¹ that were directly impacted (Department of Census and Statistics, 2005; KRDT, 2005a; UNEP, 2005a). Hambantota was one of the worst affected districts on the southern coast. According to the Department of Census and Statistics and the District Disaster Management Committee (DDMC) almost 17,000 families were directly affected and 92% of the fishing fleet in the district were destroyed (IWMI, 2005).

³⁰ In Sri Lanka, there have been historical recordings of earthquakes, tidal waves and submersions by the sea that had enormous impacts on the political and social life at the time. For example during 200 B.C. the Mahawansa documents an incursion of the sea at Kelaniya which was a distance of seven guavas (28 miles) from the coastline (CCD, 2004). However in Sri Lanka's more recent history, nothing on the scale of the Asian Tsunami has ever been recorded.

³¹ For administrative purposes, Sri Lanka has been divided into 9 Provinces. These Provinces are sub divided into 25 districts. Each District is divided in to Divisional Secretariat (DS) divisions depending on the population size. Each DS division consists of several Grama Niladari (GN) Divisions, which is the lowest level of administrative area (Department of Census and Statistics, 2005).

8.3 Overall impact of the tsunami at a site level

My study site Rekawa and Kalametiya, in the Hambantota district were badly impacted by the tsunami. In the Rekawa area, the western sides of the two major bay segments of this coastal stretch and the adjoining villages were damaged by the tsunami. In Kapuhenwela, for instance, where the natural estuary of the Rekawa lagoon is situated, the tsunami waves were channeled in through the estuary mouth and the impact of the waves reported inland up to about 500 metres. The concrete bridge connecting the Kapuhenwela village to the main road on the other side of the lagoon canal (which is situated about 150 metres away from the estuary mouth) was destroyed due to the force and the speed of the water. Some natural protection was offered by the mangrove vegetation located about 200 metres north of the estuary opening, which had clearly absorbed the force of the waves (pers. observation; IUCN, 2005a).

In the Oruwella bay area, the tsunami waves had also penetrated inland up to approximately 500 metres, causing substantial damage to properties up to about 400 metres from the beach front. The Oruwella fish landing site or harbour where a number of temporary huts had been constructed (about 30 – 40 metres from the high tide line) was completely destroyed. Natural barriers such as the near-shore coral reef situated about 50 metres from the shore in Oruwella, offered very little protection, possibly due to being badly damaged by the coral mining³² that is undertaken in the village. Most of the scrubland found in the area was also uprooted by the force of the waves (pers. observation; IUCN, 2005a).

In the Kalametiya area, the most severe impact from the tsunami was to the Kalametiya village which was situated directly on the beach front to the south of the permanent canal connecting Kalametiya lagoon to the sea. The 31 houses that made up the village were completely destroyed. Only about 3 houses were partially standing after the tsunami (pers. observation). Nine individuals had lost their lives in this village and this included women and children (KRDT, 2005a).

³² According to scientists, at some sites in Sri Lanka, human alterations to the landscape increased the damage caused by the 2004 tsunami; this was particularly evident in areas of coral mining and of sand dune removal (Fernando, *et al.*, 2005).

The Kalametiya fish landing site or harbour (which is situated north of the permanent canal opening near Gurupokuna) also bore the direct impact of the tsunami and boats and fishing gear were badly damaged (pers. observation; KRDT, 2005a).

The tsunami waves penetrated the Kalametiya lagoon through the natural lagoon outlet and the permanent canal and the sand bar normally separating Kalametiya lagoon from the ocean disappeared entirely, and the lagoon almost appeared to be another bay on the coastline with the sea directly entering the lagoon (by the first week of January 2005 however, the sand bar had begun to slowly reform). The mangrove vegetation and reeds surrounding the lagoon were destroyed due to the force of the waves. The lagoon was polluted with debris, fishing nets and various household items. The waves also entered the properties on the western border of the lagoon, near Wewegoda, causing some minor damage (pers. observation; CERM, 2005; IUCN, 2005b; KRDT, 2005a).

In Gurupokuna close to the Kunukalliya Lewaya (saltern), the small bridge across the saltern opening to the sea had been completely destroyed by the impact of the tsunami. The waves had entered the saltern through the opening. Houses and property along this stretch of beach front had also been impacted by the waves (pers. observation).

Although property and assets had been affected, overall the number of deaths reported in Rekawa and Kalametiya however were relatively very low compared to some other parts of the Hambantota district. Table 8.1 gives an overview of the damage to Rekawa and Kalametiya (taking into consideration only the six villages that were part of my study site).

Table 8.1. Impact of Tsunami in study site

DS Division	GN Division	Villages affected	No. of deaths	No. of houses damaged	Total no. of houses in village
Tangalle	Rekawa East	Oruwella	1	21	60
	Medilla	Kapuhenwela	3	12	63
	Rekawa West	Boraluwa	0	0	98
	Gurupokuna	Gurupokuna	0	13	89
Ambalantota	Batatha South	Wewegoda	4	2	121
	Hungama	Thuduwa	0	0	123

8.4 Methodology

8.4.1 Data Collection

To determine the impact of the tsunami on my study site, an assessment using a combination of participatory and more conventional research methods was undertaken in February and March 2005. Data collection methods included focus group discussions (FGDs) and a household survey.

A total of 10 FGDs were undertaken (5 in each site – see Table 8.2) using a combination of semi-structured questions and visualization techniques. Although there was a general guideline developed for the FGDs, depending on the sensitivity of the issue during the particular discussion, some questions were left out. The FGDs were held with different fisher groups and well as with women from the community and each discussion comprised of between 3 – 10 participants (while 5 participants were invited for each discussions, often more showed up for the meeting. Due to the unusual circumstances caused by the tsunami, often many were curious to find out what the discussions were about).

Table 8.2. Focus group discussions undertaken in Rekawa and Kalametiya post-tsunami

Kalametiya
Sea fishers (who use 19.5 foot boats) in Gurupokuna and Wewegoda
Sea fishers (who use traditional canoes or <i>oru</i>) in Gurupokuna and Wewegoda
Lagoon fishers in Gurupokuna and Wewegoda (who use traditional canoes or <i>oru</i>)
Lagoon fishers in Tuduwa (who use traditional canoes or <i>oru</i>)
Women in Gurupokuna and Wewegoda
Rekawa
Sea fishers (who use 19.5 foot boats) in Oruwella
Sea and lagoon fishers (who use traditional canoes or <i>oru</i>) in Kapuhenwela
Lagoon fishers in Boraluwa (who use traditional canoes or <i>oru</i>)
Women in Oruwella
Women in Kapuhenwela

Although the FGDs started off by discussing how the community in that particular village had been affected by the tsunami both psychologically and economically and how they had coped in the immediate aftermath of the tsunami, the discussions were in general forward-looking and positive, focusing on the community's perspective of how best rehabilitation and reconstruction should be undertaken in their area, taking their own priority needs into consideration. Participants were requested to discuss their views among the group and write out their recommendations on pieces of card. They were then requested to rank these recommendations in order of priority (1= most important in terms of rehabilitation and so on). Some of the recommendations were given equal weight by the participants. Visual techniques such as mapping exercises were also utilized to highlight key physical and ecological changes to the lagoon and ocean. The participants were requested to draw a map illustrating the coast in their area or lagoon (depending on which village the discussion was being held in) and describe how the events of the 26 December 2004 had impacted the area. They then marked these changes on the map. In addition, the community field research assistants also drew maps of the different village in my study and marked the houses in the sample. With the information obtained from eye-witnesses and the household survey, they marked the extent to which the tsunami waves had penetrated and the damage limit of the waves (see Figure 8.1 for an example)

The post-tsunami household survey revisited my sample of 210 households which have been the subject of my research on factors affecting rural livelihoods since 2002. Unlike in the case of pre-tsunami data collection where questionnaires were administered to both a male and female in a household, the post-tsunami questionnaire was administered to only one respondent (as it was inappropriate to take up too much of the family's time under these difficult circumstances). The respondents were about 33% females and 67% males.

The fact that baseline data were available from the research undertaken since 2002 allowed us to assess the impact of the tsunami both on household and productive assets. The community's views on the new coastal zone management policy issues that have emerged as a result of the tsunami (e.g., 100 metre no-build zone on the south coast) were also solicited as well as their opinion on what were priorities in terms of rehabilitation activities in their area.

In line with my research focus on personal well-being and food security, these two aspects of livelihood sustainability were specifically incorporated into my post-tsunami rapid assessment.

To investigate how people's sense of personal well-being was affected by the tsunami, in the household survey, respondents were requested to indicate how they felt overall at the time the questionnaire was administered (post-tsunami). A similar methodology described in Chapter 7, Section 7.3.3 was used where each respondent was given a personal security (PS) score of 1 (feeling positive) or 0 (feeling negative). To evaluate what was influencing how the respondents were feeling after the tsunami, they were requested to list out the factors (reasons) for why they were feeling either positive or negative. These factors were coded as in the previous personal well-being survey, where as described in Chapter 7, for coding purposes, factors were broadly divided into 7 categories (or domains) for positive and 7 categories for negative feelings (these were: income related; livelihood activities related; expenses related; living conditions; composition of family; health, psychological and social issues; and environmental issues).

To determine how people coped in the immediate aftermath of the tsunami (the first two to three weeks), in terms of getting an income or purchasing food, during the FGDs participants discussed and wrote out coping strategies they had used on pieces of card. The participants then ranked these coping strategies in sequential order of how they were adopted (rank 1=strategy that was undertaken first to cope with the tsunami). Some of the strategies that emerged during the discussion had been adopted simultaneously rather than in a sequential manner. In these circumstances the participants were requested to give equal weighting to the strategies. The participants were encouraged to discuss both the strategies and ranking order to ensure that the final outcome gave the consensus opinion of the group.

Data collection was undertaken with the assistance of local field researchers who had been previously engaged in data collection during Phase 1 and 2. These community members played a vital role in data collection and methodology development, which contributed towards this exercise being truly participatory in nature. In addition, the communities in both sites extended their utmost corporation and support during data

collection³³, although these were very difficult times for them. This can be at least partly attributed to the involvement of local field researchers in the process, giving the communities a sense of ownership and empowerment. Also we had the distinct advantage of being a known-entity with the community, as we had undertaken research in the site since 2002. Hence we did not have to spend any time in building a rapport with the community and gaining their confidence. Especially in regard to the questionnaire survey, it was possible to undertake this as a result of the community researchers being involved and the previous research we had undertaken with the households. As there were many urgent requirements of the community due to the tsunami and various outside groups visiting the area to engage in post-tsunami rehabilitation activities, it was important that our research did not raise any false expectations amongst community members regarding providing them with direct aid or assistance. The objectives and purpose of the research was therefore clearly explained to the community before commencing the data collection phase of the research. Some problems were encountered however during the data collection, and are discussed in Chapter 3, Section 3.7.

8.4.2 Data analysis

Data analysis included investigating the differences in relation to the impact of the tsunami between households within and between villages in the two sites. An asset damage scoring system was developed at the household level to give a crude measure of how each household was impacted relative to each other. A separate damage score was calculated to determine extent of damage to household assets as well as productive assets such as fishing boats and gear. Each household was given a score for each asset in the following manner: 2=completely destroyed, 1=partially damaged, 0=not damaged and 'blank'=not owned. To get an overall household score, the median damage scores were calculated for each household. The median score was used in order not to confound asset ownership with loss i.e., not to give undue weight to the damage scores of people who owned more assets. The findings were presented at the village level to compare damage between the different villages and sites.

³³ When undertaking the post-tsunami survey in the 210 household sample, only 4 households indicated reluctance to respond to the questionnaire due to not obtaining any direct post-tsunami assistance from doing so. In addition, there were 3 households that had migrated out of the area and 1 household where the household head had been badly injured in the tsunami and hospitalized (his family also spent most of their time with him) during our rapid assessment. Therefore only 202 households responded to our questionnaire.

The qualitative data was used to validate and triangulate results from the quantitative data as well as to obtain a more in-depth understanding of how individuals in the community were coping after the tsunami and how they felt rehabilitation activities should be undertaken in their area. Overall, the results of my study were more of a qualitative nature due to the circumstances prevailing at the time of the assessment.

8.5 Results

Findings of my rapid assessment are broadly presented in 4 sections. First, the overall damage caused by the tsunami to the asset-base of households (taking the pre-tsunami status into consideration), followed by a discussion on the impact of this natural disaster on the communities personal well-being and how they coped in the immediate aftermath of the tsunami. Finally, the community's views on how rehabilitation should proceed in the area are presented.

8.5.1 Damage to the asset base of the communities at a household-level

This includes the damage to property and houses and household assets. Since my study placed special emphasis on the fisheries sector, damage to productive assets linked to this livelihood activity are also discussed.

8.5.1.1 Damage to houses and property

In terms of structural damage to houses in the study site, in my sample households the damage ranged from about 6% in Kalametiya to 16% in Rekawa, while the damage to property was about 11% in Kalametiya and 20% in Rekawa. Overall, based on how the tsunami wave hit each site, the impact appeared to be relatively greater in Rekawa than Kalametiya, with houses in both Oruwella and Kapuhenwela being completely and partially destroyed, while in Kalametiya, the waves flooded some houses in Gurupokuna and Wewegoda but did not cause permanent structural damage. In addition a higher percentage of property was damaged in Rekawa than in Kalametiya (see Table 8.3). This was also verified by eye witnesses spoken to in each of the villages affected, soon after the tsunami and from the village maps that illustrated the tsunami impact.

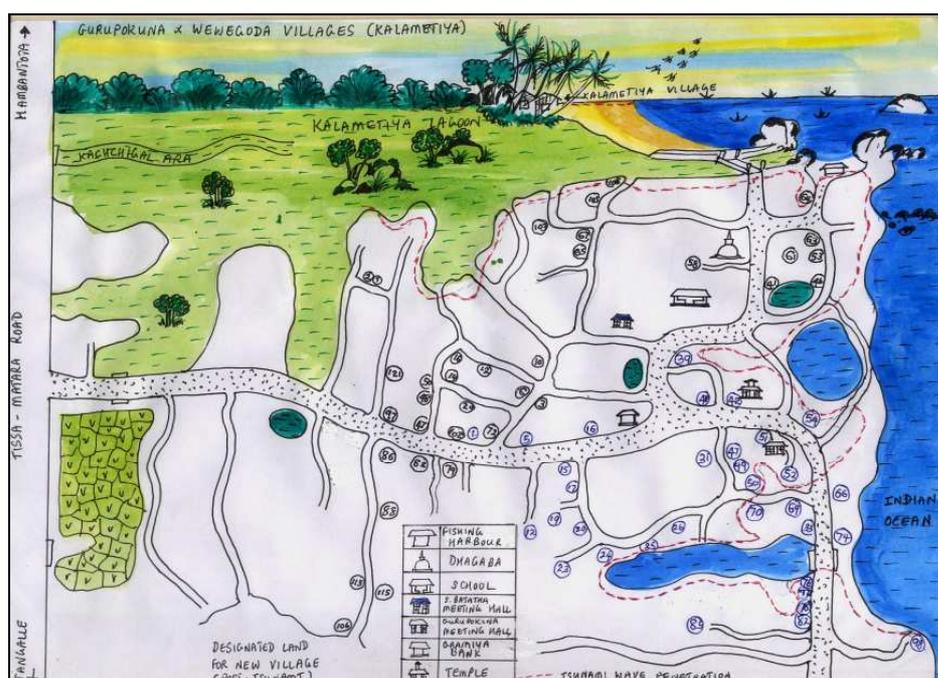
Table 8.3 Damage on Houses and Property of Sample Households in Rekawa and Kalametiya

House and Property Damage	Rekawa			Kalametiya			Overall % at Site	
	V1	V2	V3	V4	V5	V6	Rekawa	Kalametiya
Number of houses damaged	9	8	0	5	1	0	16.3	6.1
Number of houses completely destroyed	3	2	0	0	0	0	4.8	0
Number of houses partially damaged	4	4	0	0	0	0	7.7	0
Number of houses flooded but not destroyed	2	2	0	5	1	0	3.8	6.1
Number water supply disrupted	10	15	0	29	22	9	24.0	61.2
Number property/ land damaged	9	12	0	8	3	0	20.0	11.2
Sample size	35	35	34	31	34	33	104	98

(V1=Oruwella, V2=Kapuhewela, V3=Boraluwa, V4=Gurupokuna, V5=Wewegoda, V6=Tuduwa)

It is interesting to note that within each village, based on the topography of the land, some areas/households were impacted more than others (as expected, lower lying areas were impacted even further from the coast that areas at a higher elevation but closer to the coast). This was illustrated in the village maps by the tsunami wave penetration line (see Figure 8.1)

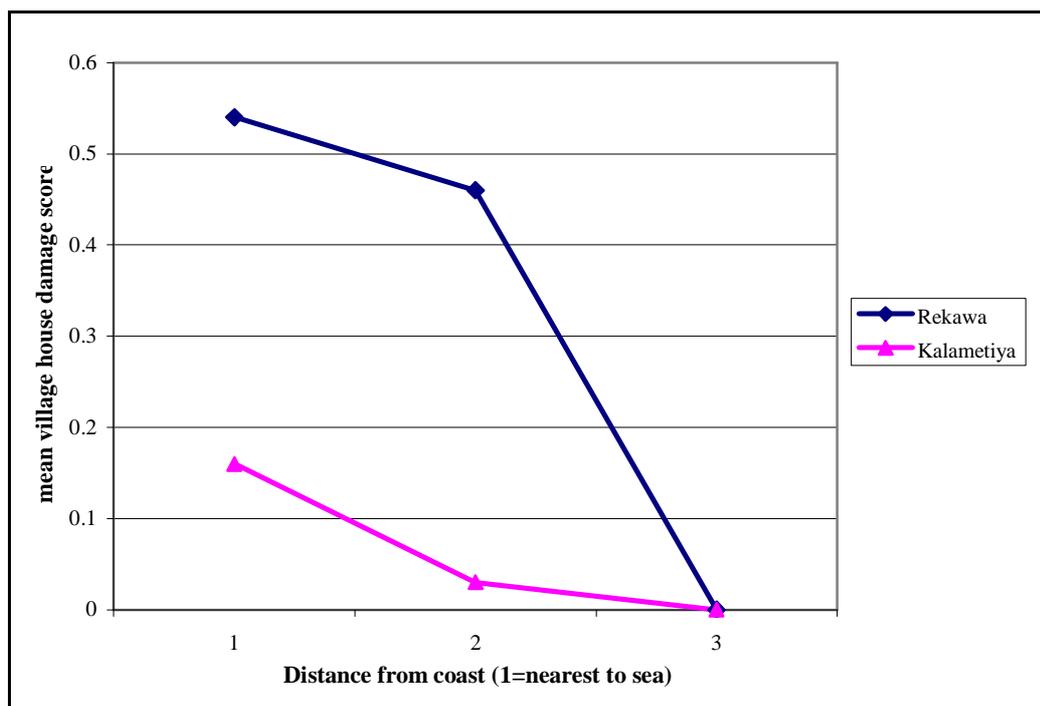
Figure 8.1 The tsunami impact line as indicated in a village map from Kalametiya



As expected distance from the coast influenced how households in the sample were impacted. In both sites, the highest number of houses and property were affected in villages nearest to the coast, followed by those in villages between the coast and lagoon (for example, in Rekawa, Oruwella - 26% and Kapuhenwela - 16% houses damaged; while in Kalametiya, Gurupokuna – 16% and Wewegoda – 3% damaged). Households in villages that were on the land side of the lagoon did not incur damage to houses and property (for example in Boraluwa and Tuduwa where no damages were recorded).

Using the above data (Table 8.3), a mean damage score for houses was calculated at the village level using a score of 0=not damaged, 1=flooded but not structurally damaged, 2=partially damaged and 3=completely destroyed. In addition, villages in each site were given a score of distance from coast where 1=nearest to coast, 2=between coast and lagoon, 3=on the landside of the lagoon. When the mean village house damage scores were plotted against distance from coast it clearly illustrated (See Figure 8.2) that as stated above, distance played a significant role in level of impact by the tsunami, with houses closer to the coast suffering more damage overall than those further away. In addition as mentioned previously Figure 8.2 clearly validates that houses in Rekawa suffered greater damage than those in the Kalametiya site.

Figure 8.2 Relationship between distance and mean village house damage score



8.5.1.2 Damage score for household assets

The asset survey that was undertaken pre-tsunami had identified asset ownership at the household level. In relation to the household asset damage score post-tsunami, damage to the following assets were recorded – TV, radio, three wheeler, motorbike, van, tractor, wooden items such as furniture, kitchen utensils and gold jewellery. Table 8.4 gives an overview of the number of households in each village that fell into the three different household asset damage score categories.

Table 8.4 Median damage scores for household and productive assets in the sample households in Rekawa and Kalametiya

Median Damage Scores	Rekawa			Kalametiya		
	Number of households Oruwella	Number of households Kapuhenwela	Number of households Boraluwa	Number of households Gurupokuna	Number of households Wewegoda	Number of households Tuduwa
Median household asset damage score						
Not damaged = 0	26	28	33	27	33	33
partially damaged = 1	0	2	0	2	1	0
completely destroyed = 2	9	5	0	2	0	0
Median fishing boat damage score						
Not damaged = 0	0	0	5	0	0	0
Partially damaged = 1	11	4	3	7	6	4
Completely destroyed = 2	4	6	0	6	5	2
Median fishing gear damage score						
Not damaged = 0	1	0	9	1	0	1
Partially damaged = 1	3	7	0	4	0	0
Completely destroyed = 2	13	1	2	11	15	7

As expected, Oruwella showed the highest household asset damage score and Kapuhenwela the second highest in Rekawa. In Kalametiya, Gurupokuna had the highest household asset damage score and Wewegoda the second highest. Both Boraluwa and Tuduwa did not record any asset damage scores as none of the houses in these villages were physically impacted as mentioned above. The results correspond to those above on overall household damage (i.e., villages with higher number of houses damaged have

higher median asset damage scores). In addition, as expected, there was a significant correlation between extent of damage a house had suffered and the median household asset damage score (Table 8.5), where houses that had been completely destroyed had higher asset damage scores than houses that had been flooded but not suffered any permanent structural damage.

Table 8.5 Relationship between extent of damage of a house and median household asset damage score

Extent of damage of the house	Median household asset damage score
Spearman's Correlation Coefficient	-0.337
Sig. (2-tailed)	0.000
N	200

The median household asset damage scores were averaged at the village level, so that damage per village could be compared (see Table 8.6). At the village level, Oruwella has the highest average score, followed by Kapuhenwela, Gurupokuna and Wewegoda respectively. This once again verified that overall Rekawa suffered a higher impact to households in terms of damage to houses and household assets than Kalametiya (Rekawa averaged score = 0.29, Kalametiya averaged score=0.07). As expected, Boraluwa and Tuduwa both have a household asset damage score of 0 at the village level.

Table 8.6 Median damage score for household and productive assets averaged at village level

	Rekawa			Kalametiya			Overall Median Score at Site	
	V1	V2	V3	V4	V5	V6	Rekawa	Kalametiya
Median household asset damage score averaged at village level	0.51	0.34	0	0.19	0.029	0	0.29	0.07
Sample size	35	35	33	31	34	33	103	98
Median boat damage score averaged at village level	1.27	1.6	0.375	1.46	1.45	1.33	1.15	1.43
Sample size	15	10	8	13	11	6	33	30

	Rekawa			Kalametiya			Overall Median Score at Site	
	V1	V2	V3	V4	V5	V6	Rekawa	Kalametiya
Median gear and nets damage score averaged at village level	1.7	1.13	0.18	1.63	2	1.75	1.11	1.79
Sample size	17	8	11	16	15	8	36	39

(V1=Oruwella, V2=Kapuhenwela, V3=Boraluwa, V4=Gurupokuna, V5=Wewegoda, V6=Tuduwa)

8.5.1.3 Damage scores to productive assets in relation to fisheries livelihoods

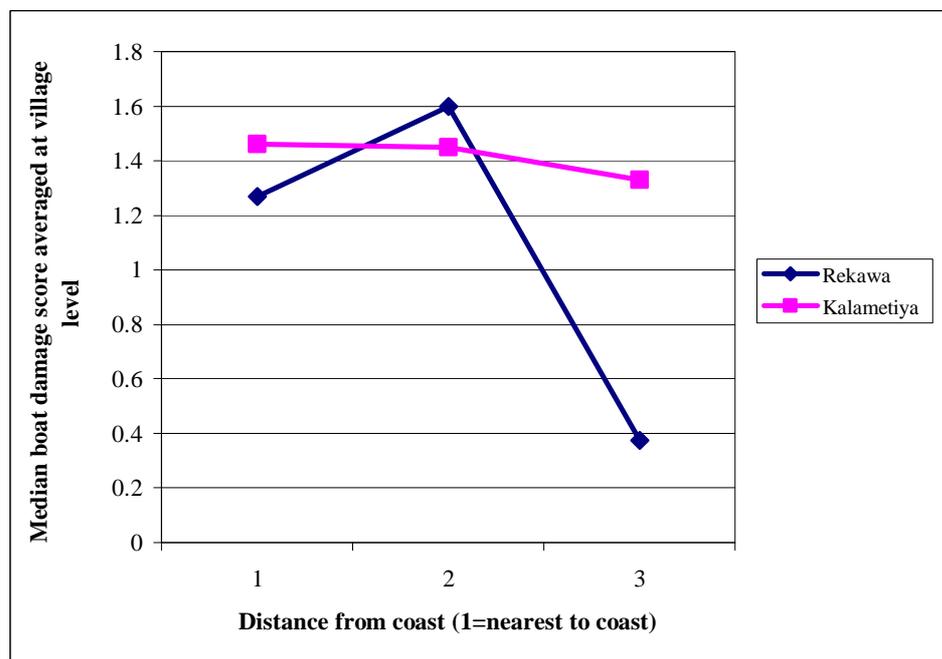
Of the sub sample of fisheries households (there are a total of 119 households at the time of the rapid assessment), 63 households owned a boat/s (a total of 72 boats) and 75 households owned gear. In the case of obtaining the median asset damage scores for boats and gear, only households that actually owned boats/gear were considered.

Each households that owned a boat/s was given a boat damage score, using a score of 0=not damaged, 1=partially damaged and 2=completely destroyed. To get an overall household score, the median boat damage scores were calculated for each household. With respect of the fishing boats it appeared that all six villages had suffered losses irrespective of location (see Table 8.4). The median fishing boat damage scores were averaged at the village level (see Table 8.6) and indicated that overall the highest losses had been incurred in the Kalametiya site.

A large number of different types of gear are used in the site and the number of types of gear used per household in the sample ranged from 1 type to 7 types. Different combinations of gear type were used in different villages (see Chapter 4, Table 4.8). To calculate the gear damage score, each type of gear was given a score of 0=not damaged, 1=partially damaged and 2=completely destroyed. To get an overall household score, the median gear damage scores were calculated for each household (see Table 8.4). The median score was used as in the previous cases in order not to give undue weight to households that owned and used a larger number of gear types. When the median fishing gear damage scores were averaged at the village level (see Table 8.6), the results showed that as in the case of the boat damage, overall the highest losses had been in the Kalametiya site.

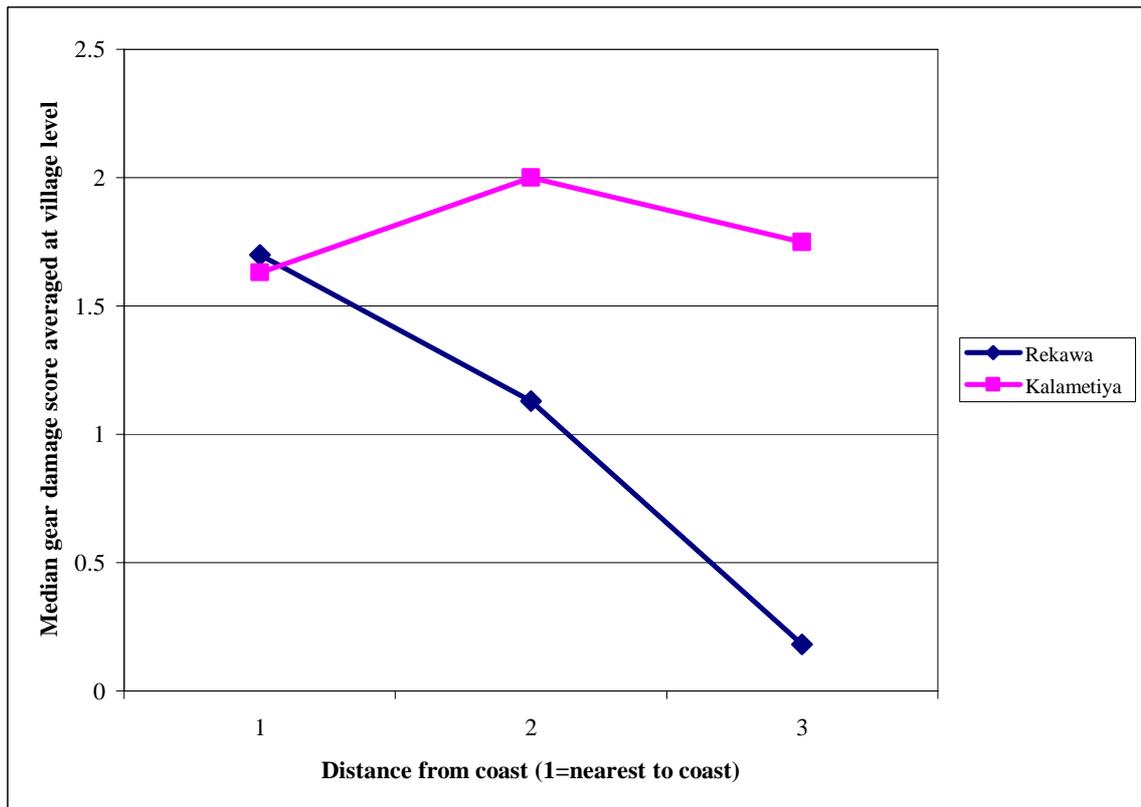
Unlike in the case of house, property and household asset damage, as expected, the impact on boats and fishing gear was not related to location of village in relation to the coast, as boats and fishing gear are usually left on the beach at the fish landing site³⁴. This was clearly illustrated when mean boat damage score and gear damage score at the village level were plotted against distance from coast (Figures 8.3 and 8.4). As mentioned previously, in Kalametiya, both Gurupokuna and Wewegoda use a common fish landing site which is situated on the strip of beach near the permanent opening of the Kalametiya lagoon to the sea. In Rekawa, Oruwella has its own fish landing site and so does Kapuhenwela. Those engaged in lagoon fishing (such as in the villages of Tuduwa, Gurupokuna and Wewegoda in Kalametiya, and Boraluwa and Kapuhenwela in Rekawa) usually leave their lagoon canoes and gear on the bank of the lagoon. While some fishers only had the fishing gear used for that season in their boats (other gear being stored at home), others had not been so fortunate and had lost all their gear due to storing all their different types of gear in their boats.

Figure 8.3. Relationship between distance and mean village boat damage score



³⁴ In pre-tsunami times, a majority of fishers tended to store all their gear in their boats, while some stored gear not used for that particular fishing season at home. After the tsunami, most fishers were of the opinion that they should try and store all their gear at home, to avoid such a loss in the future.

Figure 8.4 Relationship between distance and mean village gear damage score



8.5.2 Impact of the tsunami on personal well-being

The Asian tsunami was a completely exceptional event and the communities in Rekawa and Kalametiya had never previously experienced a natural disaster of this nature or on this scale. During the ten group discussions, participants were requested to describe in their own words the events that they experienced on the 26 December and how it had affected them psychologically. Many of them had personally eye-witnessed the tsunami waves and had only narrowly escaped with their lives. Some of the participants therefore still appeared to be traumatized and in the process of recovering from their harrowing experience. For a majority of them this was the first time they had spoken about their experiences in this kind of forum and they appeared to find this a healing exercise, indicating that they felt a sense of relief discussing their experiences with one another. A number of testimonies of both male and female participants were recorded during the discussions. One testimony from both Rekawa and Kalametiya are given below (Box 8.1 and 8.2) to illustrate some of the key features that emerged during the discussions.

**Box 8.1. Testimony of H. W. Lalith, Sea Fisher (hired help on a 19.5 foot boat),
Wewegoda Village**

When the ocean initially receded just before the tsunami struck, Lalith was as bewildered as all the other fishermen who were on the beach that fateful morning, but he realized that something out of the ordinary was taking place and rushed to try and save the outboard boat engine which was attached to his brother's 19.5 foot fiberglass boat at the Kalametiya fish landing site. However, while trying to remove the engine from the boat, he was struck by a massive wave and found himself swept out at sea. The wave was extremely powerful and he had frantically clung onto a small oruwa that was floating past him but his relief was short-lived as soon after, the oruwa had been dashed against some rocks and been totally smashed, while he had been flung back into the ocean and managed to grab onto a piece of the smashed oruwa to stay afloat. He had then witnessed the body of a young infant floating past him and had tried to grab onto it but had failed due to the speed at which the waves were moving. A fishing boat from the village had rescued him several hours later. He had a twisted shoulder and many cuts and bruises and was in a state of shock. He had been rushed to a medical clinic by his family and his injuries attended to. Lalith found it difficult to believe he had managed to survive this ordeal and was extremely relieved to be alive. He however stated that he still had reoccurring nightmares about his experience and felt a real sense of fear of the ocean ever since. But like many fishermen, Lalith was of the opinion that he needed to get back to fishing as soon as possible so that he could earn a living and his family could get back to some sense of normalcy.

**Box 8.2. Testimony of K. H. Sujatha Ranjini, Wife of a Fisherman from Oruwella
Village**

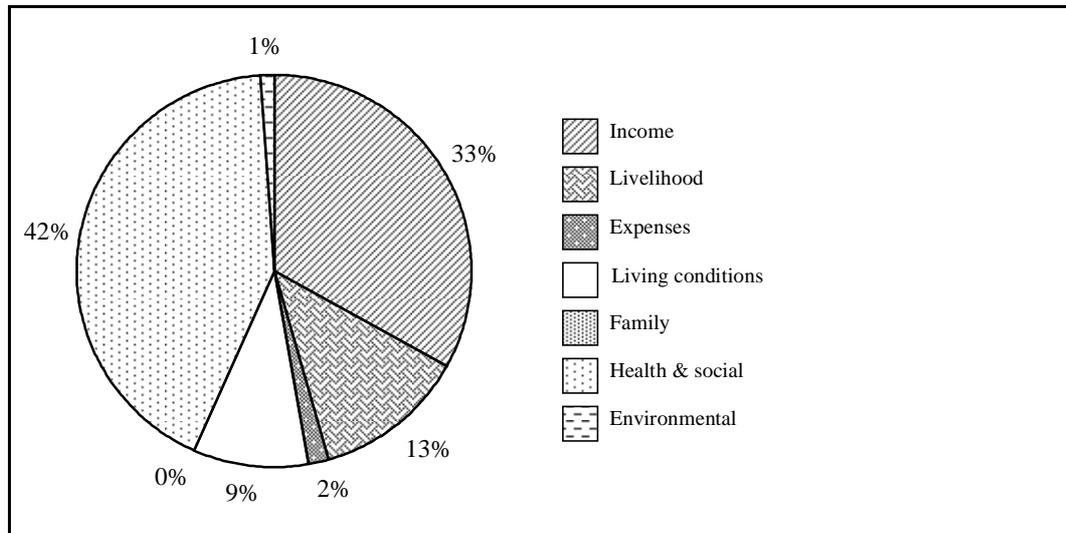
Ranjini's eldest son of 19 years had died in the tsunami so she was still mourning the loss of a loved one. Her son had been on the beach on the morning of the 26th December when the first wave hit and not realizing the gravity of the situation had been trying to moor their 19.5 foot fiberglass boats. Although he was a good swimmer, he appeared to have knocked his head hard against something and had lost consciousness. It was only after the second wave struck, that a group of youth from the village had gone out in a boat and found him floating in the sea in a semi-conscious state. They rushed him to hospital, but it was too late and he had died on admission. Ranjini had been at home at the time with her other children and the tsunami waves had struck their house, destroying it completely. She said it was too powerful to escape and they just clung onto trees and pieces of furniture that were floating by to save themselves. The waves had struck so unexpectedly that they had been in a complete state of shock. It was only later that she discovered that her eldest son had also died. Although they had lost all their belongings - their house, household assets, their boat and fishing gear, she stated that nothing compared to the loss of her eldest son. She was disillusioned with the rehabilitation process in the village, indicating that although they had been promised temporary accommodation until permanent housing was provided, two months after the tsunami, nothing had been provided and they were still staying at a relative's house in the village.

In terms of the personal well-being of those affected, as expected, in the post-tsunami survey, from a sample of 200 respondents, a majority were feeling negative (192 respondents) and only a small number were feeling positive (8 respondents). When compared to the pre-tsunami personal well-being survey findings (Chapter 7 Section 7.4.1), where 46% of the respondents stated that they were negative 10 years prior to the survey and 59% of the respondents were feeling negative during the time of the survey in January 2003, in the immediate aftermath of the tsunami 96% of respondents were feeling

negative. As expected the tsunami had therefore had an enormous impact on the overall personal well-being and security of those in the study site.

It was interesting to note that in the post-tsunami personal well-being survey, a similar pattern emerged to pre-tsunami, in terms of main categories or domains that influence how individuals felt overall. In the case of those feeling negative, factors in the health, psychological and social issues category were the most frequently mentioned and ranked the highest (42% of overall PS score). Psychological reasons mentioned were: being afraid that another tsunami would strike, being afraid of living near the sea and the lagoon, afraid of going fishing and being upset about the loss of lives and destruction that had been caused by the tsunami to the area as well as the country as a whole. In addition some respondents mentioned that they were upset by the conflict and tension that had arisen among the community with regard to obtaining relief and rehabilitation aid as well as the fact that some families previously well-off had suddenly suffered great economic losses. Income related factors were also ranked highly (33% of overall PS score) and included reasons such as not having an income due to the tsunami affecting their primary livelihood and being dependent on relief assistance. In respect to livelihood related factors (scored the third highest with 13% of overall PS score), the damage and destruction to livelihood assets was the main reason mentioned in addition to the replacement of boats and fishing gear taking place too slowly. In regard to living conditions, respondents stated that they were unhappy due to their houses and household assets being damaged by the tsunami. In the case of the few individuals feeling positive post-tsunami, the main reasons given were: almost everyone having lost their boats and gear so being in a similar situation and obtaining food aid and therefore having fewer expenses on food.

Figure 8.5. Overall negative personal well-being scores for respondents of post-tsunami survey



To determine whether there was any significant relationship at the household level between how people were feeling in the post-tsunami personal security survey to the pre-tsunami survey a binary logistic regression was undertaken with the post-tsunami PS score as the dependent variable and the pre-tsunami PS score, gender of respondent, site and wealth rank of respondent (pre-tsunami) as the explanatory variables, i.e., $PS(\text{post-tsunami}) = f(\text{gender}, PS \text{ pre-tsunami male}, PS \text{ pre-tsunami female}, \text{site}, \text{wealth rank})$. It must be noted that as in the post-tsunami survey the questionnaire was only administered to one respondent per household (either male or female) and in the pre-tsunami survey the questionnaire was administered separately to both a male and female respondent in each household, gender had to be included as a separate explanatory variable.

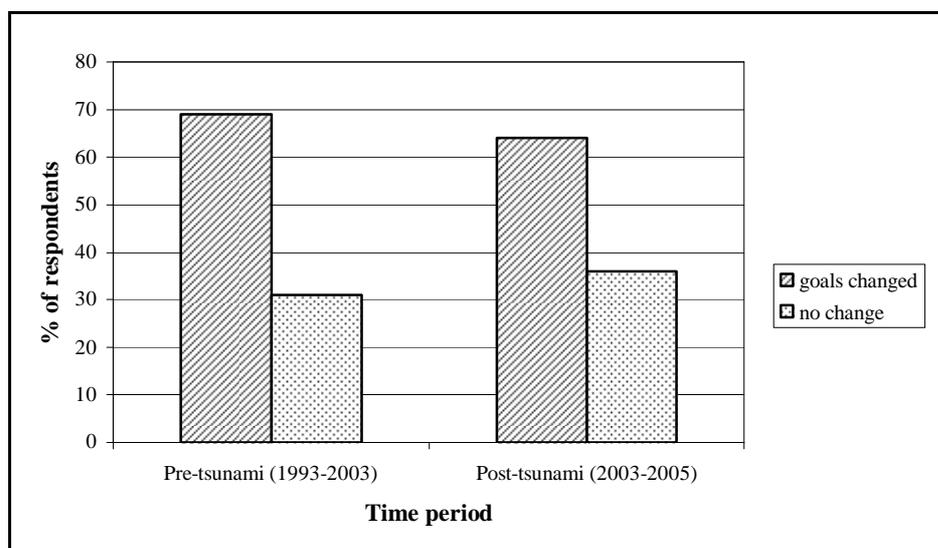
The results from the binary logistic regression modeling showed no significant relationship between positive and negative feelings post-tsunami and pre-tsunami feelings, site, gender or wealth rank. This can be attributed to a majority of respondents feeling negative post-tsunami as a result of the catastrophic impact the tsunami had in general on their life (as indicated by the factors given above) and therefore this negative feeling was irrespective of how individuals felt before the tsunami, gender, wealth rank or site. While wealth ranking significantly contributed to how people felt in the pre-tsunami scenario, with the proportion of respondents who felt positive decreasing from 'rich' to 'poorest' wealth rank for both males and females (Chapter 5, Section 5.4.3.8), in the post-tsunami situation individuals felt negative, regardless of whether they were rich or poorer

since all households were impacted by the tsunami. This was also verified by the fact that when a Spearman's correlation test was carried out, wealth rank showed non-significant results with the median household asset damage score, median boat damage score and median gear damage score variables (i.e., household and productive assets had been impacted irrespective of wealth rank).

As an indication of the manner in which the tsunami had affected how people felt about their future, respondents were requested to indicate what their current goals and aspirations were and whether these had changed from previously in any way due to the tsunami. A majority of the 200 respondents stated that their goals in life had changed as a result of the tsunami (128 respondents) while 72 respondents indicated that the tsunami had not changed their future plans and aspirations. Those who indicated that a change had taken place, were now mainly aspiring to resume their livelihoods and hoped that destroyed and damaged boats and gear would be replaced at the earliest. Some individuals also viewed the tsunami as an opportunity to better their lives. For example seven respondents who were hired help in the fisheries industry hoped that through the aid pouring into the area they would be able to benefit by obtaining their own boats and gear.

When compared to the pre-tsunami survey, where 69% of the respondents (68% of males and 70% of females) had indicated that their goals in life had changed over the 10 year period leading up to the personal well-being survey in 2003 (see Chapter 7, Section 7.4.1), the post-tsunami survey revealed that a majority of the respondents (64% overall) had changed their goals in life since the 2003 survey, and this change had been almost entirely brought about as a result the huge impact the tsunami had had on their lives. Only 36% of those interviewed post-tsunami indicated that their goals in life had not changed since the time of the 2003 survey (see Figure 8.6).

Figure 8.6. The changes in life goals of respondents pre-tsunami (over a 10 year period) and post-tsunami (over a 2 year period))



8.5.3 Coping with the impact of the tsunami

The findings of the 10 group discussions revealed that a variety of coping strategies had been adopted by the communities in Rekawa and Kalametiya. Depending on the impact of the tsunami in each village the coping mechanisms adopted varied somewhat, but overall, a similar pattern emerged in each village (see Annex 8.1). Informal social safety nets at the family and community level played a vital role in the survival of these people soon after the tsunami struck and was mentioned in 8 out of 10 of the group discussions and ranked as the first strategy adopted soon after the tsunami. Relatives assisted affected families by providing them with temporary shelter, food and other essentials. Borrowing money from relatives and friends was also mentioned in 6 out of 10 of the discussions and once again the ranking sequence was high (ranked between 1- 3).

Household food consumption patterns had also changed soon after the tsunami, with many respondents indicating that they cooked fewer times per day (thereby skipping meals) and also used food in the house more sparingly. Others mentioned harvesting plants and other food products from nearby areas for consumption purposes. In addition, to compensate for the loss of income, coping strategies such as utilising savings, pawning household assets (such as gold jewellery) and borrowing from village level societies were adopted at the household level. It is important to note that these strategies have all been mentioned previously as initial short-term strategies adopted in these communities when

facing a lack of money or food, in the pre-tsunami food security study that was conducted.

Obtaining relief assistance from private organizations and individuals immediately after the tsunami also ranked high in a majority of the group discussions in both Rekawa and Kalametiya. These private individuals or organizations had assisted in the form of providing cooked meals in the days following the tsunami (mentioned in 5 of the discussions and ranking sequence between 1 – 3) and thereafter by providing relief aid in the form of dry rations, water supply and also by replacing essentials that had been lost such as school material and kitchen utensils (mentioned in 9 of the discussions and ranked between 1 – 4). A majority of the participants were of the opinion that without the immediate relief provided by various private individuals and organizations, in the first few days following the tsunami, coping with the disaster would have been a much more difficult task.

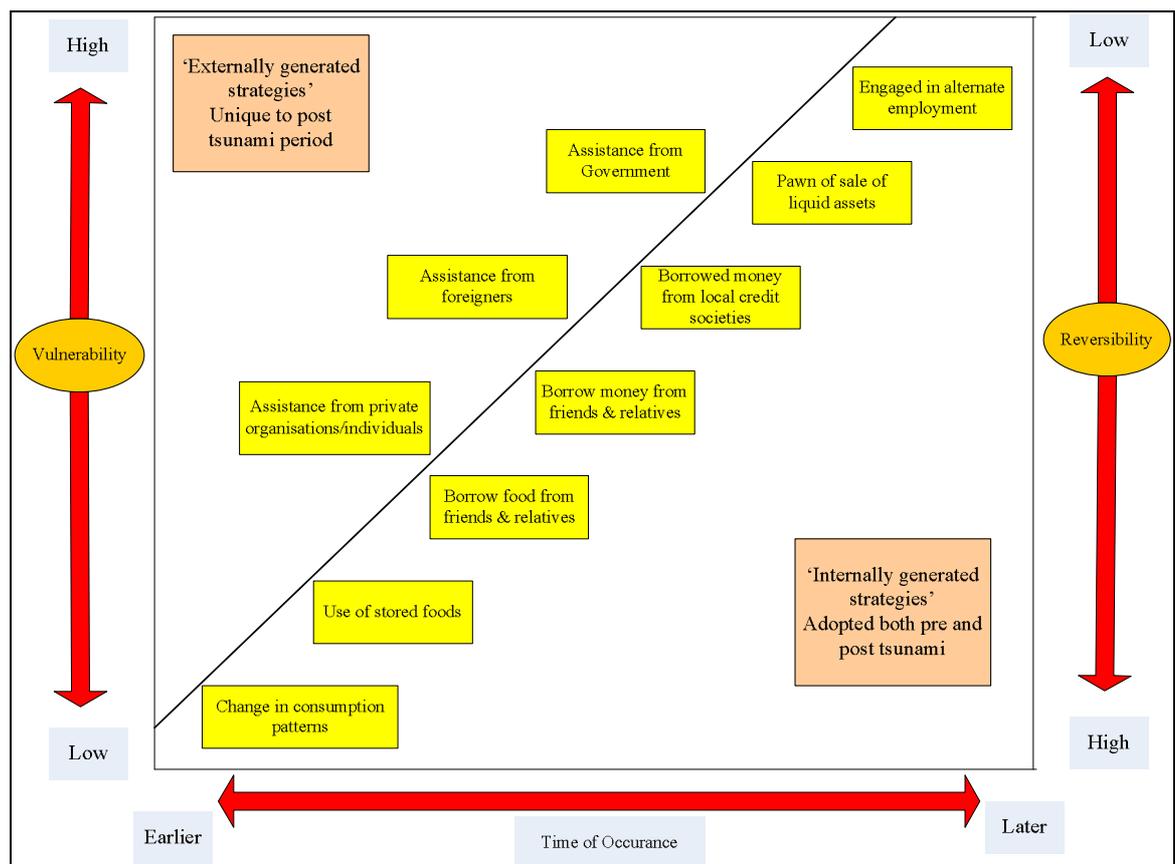
Immediate assistance from the Government was relatively slow to reach these villages. The Government relief aid comprised of food stamps to use at state cooperative stores of the value of Rs. 375/= per family member per week, a Rs. 5000/= stipend per month for each family affected and Rs. 2500/= to replace kitchen utensils in households whose kitchens were damaged. This aid was received only in February 2005 and in some cases had not been received during the time of the discussions (hence only a few FGDs have mentioned obtaining this Government aid, although subsequently all the villages did receive the aid).

Due to the resumption of fisheries livelihoods not taking place soon after the tsunami disaster, some groups stated that to cope with the loss of income they had resolved to undertake other forms of employment such as engaging in casual labour or in the case of some lagoon fishers, fishing in different reservoirs. This particular strategy had only been adopted by sea and lagoon fishers in Kalametiya, not in Rekawa.

Annex 8.1 highlights the coping strategies that were mentioned in the pre-tsunami food security interviews and those that were not. It was evident that strategies that were mentioned both pre-tsunami and post-tsunami were “internally” generated; where the household tried to independently cope with the crisis, whereas those strategies mentioned

only in the post-tsunami scenario were possible mainly as a result of external intervention. Overall, the discussions revealed that groups in Kalametiya appeared to adopt more internally generated strategies whereas the groups in Rekawa did not adopt many of the strategies they had done in the pre-tsunami scenario and almost immediately depended on external assistance. This is particularly apparent in Oruwella, which may be as a result of overall damage to the village being higher (21 houses were completely destroyed, see Table 8.1) and many families initially stayed in temporary camps. In Kalametiya, groups adopted a combination of both internally and externally generated strategies to cope. Informal safety nets that included the extended family and close friends played an important supporting role in the case of food and money shortages in both pre- and post- tsunami scenarios in both Rekawa and Kalametiya, irrespective of gender or livelihood (sea or lagoon fishing).

Figure 8.7 Coping strategies adopted in my study site pre- and post-tsunami



It must be noted that the timing of a strategy is not the same as importance to survival but unfortunately at the time of the FGDs, the participants found it difficult to separate timing and importance. Therefore although the sequencing of coping strategies was useful in

terms of assessing how people coped in the aftermath of the tsunami in these particular villages, it did not give us an indication of what communities felt were the most important strategies in terms of their longer term survival. This was one of the drawbacks in this particular assessment.

8.5.4 Looking ahead - Community's Perception on Rehabilitation Activities

While the tsunami was considered a national disaster and therefore a central government driven mechanism was set in place to undertaken rehabilitation work island-wide, it was important to get the views and opinions of those who had been directly impacted. In my study therefore the community' perception on rehabilitation activities in Rekawa and Kalametiya were recorded.

8.5.4.1 Overall rehabilitation

The research did not dwell on the hardships the community had to undergo in the immediate aftermath of the tsunami, but also helped them look ahead into the future in a more constructive manner. To obtain an idea of what the community's own perception was of what post-tsunami rehabilitation activities that should be addressed in their area on a priority basis, respondents to the household survey were requested to rank activities listed in Table 10 in terms of importance (1=most important rehabilitation activity in area). The median rank value was used as the overall rank.

Table 8.7 Rehabilitation work in the village - community's perception of priorities

Activity	Median Rank	Total number of individuals who responded to this strategy	Percentage of individuals that ranked it in this order	Percentage of individuals who did not rank this strategy
Providing new plots of land for those who lost houses	3	202	20.3	1.5
Rebuilding houses that were destroyed	2	202	20.8	1.5
Replacing/repairing boats that were destroyed/damaged	2	202	28.2	1.5
Replacing/repairing fishing gear that was destroyed/damaged	2	202	25.7	1.5
Other	5	32	81.3	84.2

According to the post-tsunami survey, rebuilding houses that were destroyed, replacing or repairing boats that were destroyed or damaged, and replacing fishing gear and nets, were all considered rehabilitation activities of equal importance (all three activities had a similar median rank). The respondents indicated that these three activities should be addressed on a priority basis and this reflects the manner in which the study site was impacted. While one could argue that rebuilding houses that were destroyed would be more a priority than rehabilitating livelihoods, in our household sample since livelihoods were impacted on a larger scale than houses, respondents ranked actions taking into consideration their own personal needs. Providing new plots of land for those who had lost houses was considered the next most important rehabilitation activity. In addition to these main issues, respondents were also given the opportunity to record any other activities should be included in rehabilitation programmes in their area and 18 respondents indicated that alternate livelihood opportunities should be created for those affected by the tsunami, 5 respondents whose houses were badly damaged stated that in addition to replacing their houses, household assets that were lost should also be replaced, while four respondents mentioned that those affected by the tsunami should also be helped psychologically to get back to a normal life. Five respondents were of the opinion that the needs of poorer households that were *not* affected by the tsunami should also not be forgotten in the overall rehabilitation and development initiatives in the area.

In the household survey respondents were also requested to give their opinion on what they felt was required to ensure that rehabilitation and reconstruction efforts undertaken in the village were successful in the long term. Of the sample of 201 households, only 48 responded to this question, as a majority appeared to be unsure of how long-term sustainability could be guaranteed. Of the 48 who did respond 13 indicated that what was required was accurate data being made available by the community to the rehabilitation groups at the village level, 10 respondents stated that community participation was critical for success at the village level and 7 respondents indicated that a close link should be established between the community and the rehabilitation organizations. For this purpose 6 respondents were of the opinion that a committee should be set up at the village level to liaise with the rehabilitation groups and 10 respondents stated that a proper management plan at the village level needed to be also drawn up. There were 10 respondents who felt that the Government needed to set up a proper programme at the village level to ensure the long-term success of rehabilitation work.

8.5.4.2 Fisheries livelihood-related rehabilitation work

During the seven group discussions held with sea and lagoon fishers in the study site, their views on how the rehabilitation of fisheries livelihoods, should be undertaken in their area were recorded. The participants discussed their ideas among the group and wrote out their recommendations on pieces of card. They then ranked these recommendations in order of priority (1= most important in terms of fisheries livelihood rehabilitation). The overall findings are given in Annex 8.2.

The findings indicated that as expected, the resumption of their primary livelihood at the earliest was considered a priority by all the fisher groups. They hoped that in consultation with them, their fishing boats and gear would be either repaired or replaced at the earliest (mentioned in all 7 discussions). The fishers also stated that they felt the fisheries inspection officers should identify and assist the genuine fishers who had been impacted by the tsunami (mentioned in 6 of the discussions). This was specifically mentioned as some individuals who were not engaged in fishing as their primary livelihood had apparently used this opportunity to make false claims to officials that they owned boats or gear in the hope of obtaining these assets. This had caused some fear among the fishermen that the number of boats operating in their area would increase unregulated and create greater competition as well as conflict for the limited coastal fisheries resource. Another general recommendation made by the fishers was that there should be a mechanism to ensure that aid and assistance is given to those individuals actually affected by the tsunami and genuinely needing the help the most (this was mentioned due to some donor organizations helping only certain groups within the community and not others and this causing tension between households who received assistance and those that did not, especially when those genuinely affected had been left out). They also stated that there should be no political bias in aid distribution and felt that no group should attempt to gain political mileage out of this disaster.

Other recommendations that were highlighted reflect the specific needs of the different villages and fisher groups (i.e., lagoon and sea). For example, sea fishers in both Rekawa and Kalametiya indicated that they required their fish landing sites to be rehabilitated and upgraded. As mentioned previously, these sites being on the coast, had been directly impacted by the tsunami. In Kalametiya, sea fishers also recommended that a tsunami

rehabilitation committee to be set-up in the village that included representatives from the different fisheries sectors (example representatives of those who use traditional oruwas, 19.5 foot outboard engine boats), as well as the Fisheries Inspection Officer and the Grama Niladari. Any activity to be undertaken in regards to rehabilitation of fisheries livelihoods would be brought to the attention of this committee. In addition, the fishers recommended that any donations made to Kalametiya in relation to fisheries would also be notified to the committee. This would ensure that the rehabilitation process was transparent at the village level. They also suggested that the post-tsunami fisheries rehabilitation effort had created an ideal opportunity for certain unsustainable fisheries practices to be regulated properly. For example, bottom-lying nets (that caused damage to fish habitats) and nylon beach seine nets (that often caught juvenile fish). Lagoon fishers in both Rekawa and Kalametiya had specific recommendations in relation to rehabilitation of the two lagoons that broadly covered issues such as removing excessive silt and ensuring that salinity levels remained constant in the lagoons. In Kalametiya, lagoon fishers also recommended that certain unsustainable fisheries practices were regulated properly (such as the use of thangus nets with the net size being less than 3 inch, which invariably caught juvenile fish).

8.5.4.3 Alternate livelihood activities

In addition to the rehabilitation of the fishing industry, in the event of some fisher families looking into alternative livelihood options as a result of the tsunami, during the group discussions, participants were requested to indicate what their views were on the subject. A majority of the participants were of the opinion that the women in the community could also engage in suitable income generating activities rather than just depending on the household's primary livelihood. They felt that if they had not depended so heavily on fishing or fishing related livelihoods, and instead had a more diversified livelihood system, they would have found it easier to cope with the impact of the tsunami. In addition, where other natural resource based livelihoods had been directly impacted by the tsunami (for example in Oruwella – coral mining had stopped after the tsunami as the community was afraid of the impact of coral mining on erosion and hence lime kilns operating in the village had also been halted). These individuals (mainly women) were also desperate to engage in alternate livelihoods. The participants suggested home gardening projects where they could sell their produce, poultry farming, brick making,

coir rope making, mending fishing nets, producing handicrafts using local reed varieties, sewing and making batiks. However they felt that to venture into these activities they would require appropriate training and also need to find a suitable market for selling these products. In addition, the participants felt that fishermen could benefit from obtaining some training in boat and engine repairing. For example after the tsunami, there was a lack of trained boat repairers locally to help repair boats that were damaged by the tsunami but salvageable.

It must be noted that from past experiences of alternate livelihood initiatives introduced in the coastal sector in Sri Lanka, the success rate of these alternate livelihoods in the long-term is very low unless certain criteria are given adequate attention (see Chapter 4, Box 4.1, for some lessons learnt from the Rekawa SAM experience). For example, proposed livelihood initiatives need to take into consideration the different realities of the communities involved, including their gender, educational backgrounds, strengths, skills and aspirations. In addition, the natural resource base in the site, the potential income from the proposed livelihood development activity, relevant links to suitable micro-credit facilities, and information on existing marketing networks and how to access these, need to be properly assessed prior to initiating new income generating activities (IRMP CEA, 2003; Senaratna Sellamuttu and Clemett, 2003a; CERM, 2004; SARCEP 2004).

8.5.4.4. Future long-term development

Although the tsunami had a devastating impact on the lives of the communities in the study site, it had also created the opportunity not to just return to the pre-tsunami status, but for better, more well planned development than what existed previously to take place. In this scenario, participants at the ten FGDs discussed how they would recommend overall rehabilitation and long-term development efforts in their area should be undertaken. The participants discussed their views among the group and wrote these out on pieces of card. Thereafter they ranked these recommendations in order of priority (1= most important in terms of achieving long-term development in their area). The findings of the ten group discussions are given in Annex 8.3.

Overall better infrastructure development in the area was recommended in all the discussions. For example, rehabilitating the main roads as well as bridges in the villages

was mentioned in all 10 discussions and considered a priority (i.e., had a high ranking sequence, ranked between 1-2) in all discussions. In Kalametiya for instance, the main road leading to the fisheries harbour had been in a dilapidated state for a number of years. This has caused many hardships for the people in Gurupokuna and Wewegoda as transport had become a major issue. The bus that operated twice a day usually was irregular as a result of the state of the road. In addition, fish trading was affected, with the participants stating that outside traders were reluctant to travel between the fisheries harbour and main road due to its bad condition. In Rekawa, the main road leading to the fisheries harbour in Oruwella was specifically mentioned by participants as requiring urgent rehabilitation. Bridges in the villages had been directly impacted by the tsunami and also required urgent attention. For example, in Kapuhenwela the bridge connecting the village to the main road and in Gurupokuna, the bridge across where the saltern enters the sea.

Obtaining amenities such as pipe-borne water and electricity in areas of the village that have not received these as yet was another recommendation made in a number of group discussions and considered a major priority in certain villages. In respect to electricity, Oruwella and Kapuhenwela in Rekawa and Tuduwa in Kalametiya, where some parts of the village still do not have electricity were specifically mentioned, while in respect to pipe-borne water, all three villages in Rekawa as well as Tuduwa in Kalametiya were highlighted.

Many other activities that would contribute towards long-term development and foster better social awareness and community corporation were also brought up in the discussions and these included providing better educational facilities for children in the villages (for example highlighted in Oruwella, Gurupokuna and Wewegoda), enhancing the facilities in the village temple (mentioned in Gurupokuna and Wewegoda), building a community centre in the village (mentioned in all three villages in Rekawa as well as in Tuduwa). In the event that households engaged in sea fishing are moved further away from the coast (in accordance with the new 100 metre no-build policy discussed in more detail in the next section), the community stressed that special facilities should be built for fishermen to store their gear near the fisheries harbour as well as sleep overnight if required.

8.5.4.5 Community's perception on new coastal management policy emerging after tsunami

Following the tsunami, the Government announced that through the Coast Conservation Department a restrictive constructive zone would be demarcated to an extent of 100 metres on the south and west coasts and 200 metres on the north and east coasts of Sri Lanka (UNEP, 2005a). To determine what the community's perception was on this 'no-build' buffer zone of 100 metres in Rekawa and Kalametiya, in the post-tsunami household survey respondents were requested to indicate whether they were aware of this new policy and what their opinion was on this. The reason for their particular view point was also recorded. Table 8.8 gives a breakdown of responses at the village level.

Table 8.8 Community's perception on the 100 m 'no-build' buffer zone

	Rekawa			Kalametiya			Overall % at Site	
	V1	V2	V3	V4	V5	V6	Rekawa	Kalametiya
No. of households aware of 100 m policy	34	33	26	31	34	33	90.3	100.0
No of households have good opinion	16	22	19	28	28	30	55.3	87.8
No of households have bad opinion	6	4	1	1	1	2	10.6	4.1
No of households feel has both good and bad elements	4	2	1	1	5	1	6.8	7.1
Number of households who did not have clear opinion	8	5	5	1	0	0	17.5	1.0
Sample size	35	35	33	31	34	33	103	98

(V1=Oruwella, V2=Kapuhewela, V3=Boraluwa, V4=Gurupokuna, V5=Wewegoda, V6=Tuduwa)

A high percentage of the households in both Rekawa and Kalametiya appear to be aware of the new 100 metre 'no-build' policy. A high percentage of respondents were also of the opinion that this was a good policy to adopt. The main reasons given were as expected in regard to better protection of lives (especially women and children), property and assets in case of another catastrophe such as the Asian tsunami. In addition, a number of the respondents were of the opinion that this policy would also lead to better access of the coast for those engaged in the fishing industry.

A much smaller percentage of respondents felt this was a bad policy. These respondents were of the opinion that the 100 metre no-build zone would actually have a negative impact on the fisheries industry, with fishermen finding it difficult if their homes were far away from the sea, as it would be impractical to travel and also to carry their fishing gear back home (while boats were parked at the fish landing site, fishing gear would be stored at home, especially after the tsunami). In this case they stated that they would require proper storage facilities built near the coast for their fishing equipment. Other respondents who were employed in small-scale beach tourism ventures were also concerned about this new policy having a negative impact on their livelihood. Others were under the impression that while individual owners of private land on the coast would not be allowed to build and may have to move away, the tourist industry would be exempt from this regulation, and if this were the case, they felt it was not fair on individual owners. Some respondents in Oruwella who were engaged in coral mining were worried that this rule would mean that they would be unable to continue with this practice.

It is interesting to note that overall a larger percentage in Rekawa were negative about the policy than in Kalametiya. This can be at least partially attributed to certain livelihood related factors. For example although across the board, majority of those engaged in fisheries related livelihoods were in agreement to the policy (they felt that providing better protection to their families was of primary importance, even though they would face difficulties especially with regard to storage of their gear), households in Oruwella engaged in coral mining opposed it and households in Kapuhenwela employed in beach tourism hotels were also anxious about the negative impact of the no-build zone on the tourist industry. In addition, these results may be partly due to the fact that in Kalametiya, households affected by the 100 metre buffer zone were being provided with an alternate plot of land and house in the same locality, as there was adequate government land available, while in Rekawa, due to the lack of suitable land nearby, households affected were being offered land a fair distance away from their village and people were not happy to move away from their friends and relatives (as the village constituted of close-knit social network), in addition to the practical difficulties arising for those engaged in fishing. A similar percentage of households in Rekawa and Kalametiya felt that there were both positive and negative aspects of the new policy, citing the different arguments mentioned above. In Rekawa there also appeared to be a fairly large percentage of households that were unclear on how the policy would impact them. Overall at the time of our survey,

there appeared to be some confusion with regard to this new policy, with many respondents being unaware of whether this regulation had actually been passed as law by the Government or not.

8.5.5.6 How to best prepare for future disasters

It was useful to get an idea of how communities in the study site felt they could organize themselves best at the village level to protect themselves against future natural disasters and setbacks they may be compelled to face. In the household survey respondents were requested to indicate their own views on the matter and Table 8.9 gives an overview of the recommendations made by the respondents. In Rekawa, the respondents limited themselves to two major suggestions – setting up a disaster management committee at the village level and also establishing a common fund that everyone in the village contributed to, that could be used in the event of a major disaster. In Kalametiya, in addition to these two suggestions, several other ideas were also mentioned such as to enhance the natural buffer in the coastal zone by planting suitable vegetation on the coastline and providing more stabilization by placing boulders in areas subject to coastal erosion. In addition, participants were of the opinion that they should be educated on natural disasters such as tsunamis and use this knowledge to develop a system of warning the community before a disaster strikes. They felt that it was also important to have a common pre-arranged point in the village where the community could meet up in the event of a disaster.

Table 8.9 Recommendations made by the community on how to best prepare for future disasters

Recommendation	Rekawa			Kalametiya			Overall % at Site	
	V1	V2	V3	V4	V5	V6	Rekawa	Kalametiya
Plant suitable vegetation on the coastline to give protection to the CZ	0	0	0	6	6	1	0	13
Stabilize the coastline by placing boulders	0	0	0	3	3	0	0	6
Set up a disaster management committee in the village	22	24	21	7	4	7	67	18
Set up a common fund for future disasters	4	6	11	10	3	3	21	16
Develop a system of warning the community before a disaster strikes	0	0	0	1	6	4	0	11

Recommendation	Rekawa			Kalametiya			Overall % at Site	
	V1	V2	V3	V4	V5	V6	Rekawa	Kalametiya
Set up a community centre that can be used during disasters	0	0	0	3	2	0	0	5
Educate the community on natural disasters such as tsunamis	0	0	0	6	2	4	0	12
Designate a common point to meet in the village in the event of another tsunami	0	0	0	2	1	8	0	11
Build houses near the coast on stilts	0	0	0	1	0	0	0	1
Total number who responded to this question	24	28	28	22	20	20	80	62
Sample size	35	35	33	31	34	33	103	98

8.6 Conclusions

In conclusion, the long-term presence at the study site and availability of baseline data helped put in context the impact of the tsunami on the livelihoods of this community and give a snapshot of the community's views soon after this unexpected event. In terms of personal well-being, as expected, a higher percentage of respondents were feeling negative overall compared to pre-tsunami times. The same categories or domains of well-being appeared to be important both before and after the tsunami, with the social and psychological aspects being scored the highest. Coping strategies adopted in the immediate aftermath of the tsunami were broadly divided into those that were externally driven and only used under the tsunami situation, to those that were internally driven and used both pre and post tsunami. Coping strategies that depended on informal social networks were deemed important in the case of the internally driven strategies.

In terms of assessing damage to a household's asset base, the median asset damage scoring system was useful as it placed all households on a common relative scale that could be easily compared. When the median damage scores were averaged at the village level, this provided a quick and easy method to compare damage across different villages and sites and show difference in damage to household assets versus productive assets. For example in this study it was clearly illustrated that while it is quite obvious to anyone that households closer to the coast suffered greater losses, in terms of household assets, this

was not true in the case of productive assets such as boats and gear. This also has implications in terms of rehabilitation efforts – they should not only focus on those whose households who live nearest to the coast as there are other households that may live further away from the coast but whose livelihood activity has been directly destroyed in terms of loss of productive assets. This would lead to better planning and management of rehabilitation efforts being implemented in the area.

The findings of the study also revealed some generic lessons that can be applied to post-tsunami rehabilitation efforts in Sri Lanka and perhaps even other affected countries in the region. One important lesson is that it is imperative to get the views of different groups within the community on what rehabilitation activities should take place in their area on a priority basis. While some activities may be obvious to the outsider, there may be specific needs expressed by the community based on the particular village and its social and economic characteristics that can only be obtained through community participation and consultations. For example, providing alternative livelihood activities for those engaged in unsustainable resource use practices such as coral mining or using illegal fishing gear. Rehabilitation efforts have the opportunity to implement sound natural resource management practices, especially where the communities themselves are advocating for change.

Another important lesson learned is that for proper planning to rehabilitate a tsunami affected area and to assist people who were genuinely affected and need the help most, reliable data is required down to the household level. This study has shown that different community groups can play a critical role in ensuring that accurate data are made available to the relevant authorities and rehabilitation organizations working in their area. This clearly illustrates the importance of using a participatory approach in post-tsunami assessments. In the same light, if community members participate in not only the data collection but the planning and implementation process of rehabilitation efforts, it gives them a sense of ownership and empowerment and also ensures that the rehabilitation effort is transparent at the village level – all which would be vital to ensure the long-term success and sustainability of any rehabilitation effort.

As discussed in Chapter 2, Section 2.7.1, since the early 1990s Sri Lanka's CZM policy has advocated a collaborative approach for the co-management of natural resources in the coastal zone, as demonstrated in Special Area Management or SAM sites. In relation to rehabilitation and development work post-tsunami, it is clear that a similar collaborative, participatory approach needs to be followed – in all areas impacted by the tsunami (not just SAM sites) and in all stages of the project cycle – from data collection, to planning and implementation of activities. Such a collaborative approach should be used by all the players – not just the government and communities but also the international and local relief and development agencies that are working on post-tsunami rehabilitation and reconstruction efforts in Sri Lanka.

Other policy implications of my research findings in terms of the methodologies that I tested, in addition to the application of these methods to assess the impact of co-management processes on the sustainability of livelihoods dependent on natural resources are discussed in the final chapter of my thesis.