

## **Chapter 4**

### **The Study Sites**

#### **4.1 Background**

This chapter presents an overview of the two study sites and the sample population and structures the information within a sustainable livelihoods framework that has been adapted from the DFID model. As the aim of this Chapter is to serve as a backdrop and put into context the issues covered in the three main analyses chapters of my thesis (i.e., Chapters 5, 6 and 7), not every aspect of the livelihoods framework is covered in equal depth. Specific emphasis is placed on aspects that are linked to the analyses chapters. Likewise, not every aspect of the local communities and the institutional setup governing the natural resource based livelihood systems found in the site have been included in equal depth in this background description, as this was not the central scope of the dissertation (which was primarily testing some indicators to measure poverty). This Chapter also provides some background of the site pre-tsunami, which is useful with respect to the rapid assessment undertaken at the site post-tsunami and discussed in Chapter 8.

#### **4.2 Overview of study sites**

Rekawa and Kalametiya are two coastal lagoon systems in the Hambantota District on the southern coastline of Sri Lanka. Hambantota is one of the poorest districts in the country, with 32% of the population considered to be below the poverty line<sup>11</sup> according to the Department of Census & Statistics (2002b). Rekawa is situated in the Tangalle Secretariat Division<sup>12</sup>, approximately 10 km south of Tangalle town. Kalametiya is located in the neighbouring Ambalantota Secretariat Division – about mid-way between the towns of Tangalle and Hambantota (see Figure 4.1 for a map of the study site). Both the Tangalle and Ambalantota Secretariat Divisions are among the most populous in the district. According to the 2001 census, their population counts were about 62,804 and 63,930

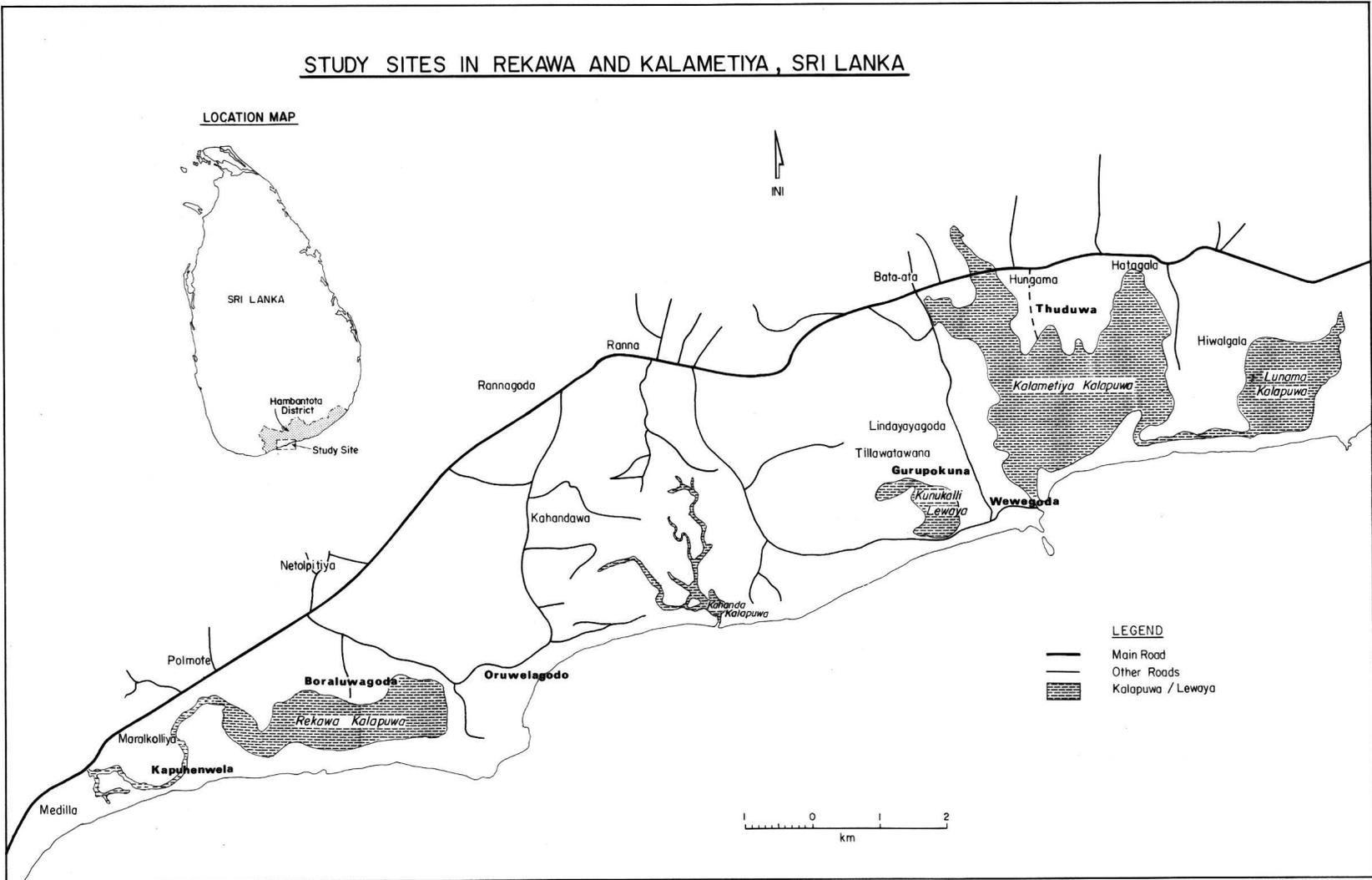
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<sup>11</sup> The estimated poverty line for the year 2002 is Rs. 1423. i.e., people living in a household whose real per capita monthly total consumption expenditure is below Rs. 1423 in the year 2002 in Sri Lanka. Hambantota is one of the poorest districts in Sri Lanka (only Moneragala, Badulla and Ratnapura were poorer in 2002).

<sup>12</sup> Divisional Secretariat (DS) – a unit of administration, where a number of DS divisions fall within one District.

respectively with a population growth rate of 1.1%. Poverty levels are also relatively high with approximately 27.1% of the population in Tangalle and 33.3% in Ambalantota being below the poverty line (Department of Census & Statistics, 2002b).

**Figure 4.1 Map of study site**



Rekawa lagoon which is about 250 ha is located at 05° 58' North latitude and 80° 50' East longitude. The lagoon is surrounded almost entirely by mangrove vegetation and scrub forest. On the seaward side it is bordered by a broad sandy beach which is about 10 km long while on the landward side of the lagoon are about 500 ha of paddy fields which lie fallow and mostly abandoned. The lagoon is connected to the sea by a narrow channel, which breaches the sea at the natural lagoon mouth. The lagoon receives most of its water from two main rivers – Kirama Oya and Urubokka Oya, and a third smaller river – Rekawa Oya (Ganewatte *et al.*, 1995; Ekaratne *et al.*, 2000; IUCN Sri Lanka, 2004).

Rekawa was one of the sites where the Special Area Management (SAM) process was initially piloted in Sri Lanka, through an USAID funded Coastal Resources Management Project. Under this initiative, a SAM plan was developed for Rekawa during the period 1992 – 1995 and had a five-year implementation schedule, from 1995 to 1999. The Rekawa SAM plan included seven *Grama Niladari* (GN)<sup>13</sup> or local-level administrative divisions (see Table 4.1) and there were 20 villages within this area (RSAMCC, 1996; Clemett *et al.*, 2004).

**Table 4.1 Demographic data for the Rekawa SAM area (source: Rekawa Development Foundation, 1997)**

GN Division	Village	Number of families	Total population
Medilla	Medilla	292	948
	Kapuhenwela		
Rekawa West	Rekawagoda	262	968
	Wellawathugoda		
	Hettiyapokuna		
	Boraluwa		
Netolpitiya South	Netolpitiya	340	1325
	Weliara		
	Lebeema		
Medagama	Medagama	158	530
	Beliwalegoda		
Rekawa East	Oruwella	210	795
	Beliwinnagoda		

<sup>13</sup> Grama Niladari (GN) Division – the smallest local-level administrative unit. One or more villages may be found in a GN division.

<b>GN Division</b>	<b>Village</b>	<b>Number of families</b>	<b>Total population</b>
Wellodaya	Kahandawa South	271	1023
	Kahandaduwa		
	Porondugama		
	Wellodaya		
	Pinwewa		
Marakolliya	Marakolliya	243	948
	Godigamuwa		

Kalametiya Lagoon is located at 5° to 6° North latitude and 80.30° to 81° East longitude and covers an area of about 606 ha. This brackish water body is fringed by mangroves and salt marshes and separated from the sea by a narrow strip of beach. The lagoon receives water from the Kachchigal Ara a non-perennial stream and also the Lunama lagoon to which it is connected by a shallow channel. Kalametiya was declared a wildlife sanctuary in 1984 in view of its diverse bird life (CEA, 1995; Jayatissa *et al.*, 2002; IUCN Sri Lanka 2004).

Kalametiya was identified as a potential SAM site in the CZMP of 1997 and declared a SAM site under the Revised CZMP (2004). Under the Asian Development Bank Coastal Resource Management Project, preliminary SAM planning was initiated in Kalametiya in mid 2002 and included eight local-level administrative or *Grama Niladari (GN)* divisions (see Table 4.2). While the Gurupokuna GN division falls under the Tangalle Divisional Secretariat (DS) Division<sup>14</sup> the other seven fall under the adjacent Ambalantota DS Division. Within the eight GN divisions, there are a total of 15 villages (Clemett *et al* 2004).

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<sup>14</sup> Divisional Secretariat (DS) – a number of GN divisions generally fall under the administration of one Divisional Secretariat.

**Table 4.2 Demographic data from the Kalametiya SAM area (source: Ambalantota and Tangalle DS Divisions, 2000)**

GN Division	Village	Number of families	Total population
Batatha South	Linda Yaya	344	1312
	Weweagoda		
	Batatha South		
	Udagama		
Gurupokuna	Gurupokuna	260	1239
	Thilla watawana		
Hathagala	Hathagala	194	1044
	Kalametiya		
Hungama	Hungama	407	1605
	Medaeliya		
	Thuduwa		
Kiula North	Kiula North	139	826
Kiula South	Kiula South	189	1060
Lunama North	Lunama North	208	735
Lunama South	Lunama South	251	897

For this empirical study, a representative sample of three villages was selected in each lagoon area, i.e., a total of 6 villages. In the Rekawa area – the Oruwella, Boraluwa and Kapuhenwela villages were selected (see Table 4.3). Oruwella in Rekawa East was selected for its proximity to the coastline and near-shore coral reef, the high proportion of sea fishermen (48%) and because it was the centre of effort under SAM to eradicate coral mining. Kapuhenwela in Medilla, where the natural estuary of the lagoon is situated, was chosen because there is a diversity of livelihoods including both sea and lagoon fishing (29%) and a high level of unemployment (13%). Boraluwa in Rekawa west was selected for its proximity to the lagoon (on the landward side of the lagoon) and the high proportion of both lagoon fishermen (18%) and casual labourers (29%).

In the Kalametiya area, the Gurupokuna, Wewegoda and Thuduwa villages were chosen as a result of their geographical location and the high number of households dependent on coastal resources. In the Gurupokuna village for example, about 58% are engaged in sea fishing and 9% in lagoon fishing. In Wewegoda, about 63% engage in sea fishing, 3% lagoon fishing and 6% in fish trading. Thuduwa which is situated on the landward side of the lagoon, was traditionally a lagoon fishing community, although at present only about

13% are involved in lagoon fishing, while 5% are engaged in fish trading and 31% have become casual labourers (Clemett *et al.*, 2004).

**Table 4.3 Stratified random sampling criteria used for selection of villages**

Village and GN Division	Geographical location	Main livelihood activities	Total number of households
<b>Rekawa</b>			
Oruwella (Rekawa East GN)	Nearer the sea	Sea fishing, fish trading, coral mining, lime kiln operating and some farming.	60
Boroluwagoda (Rekawa West GN)	Land-side of lagoon	Sea fishing, lagoon fishing, fish trading, brick making, carpentry and casual labour.	98
Kapuhewela (Medilla GN)	Between sea and land-side of lagoon	Sea fishing, lagoon fishing, fish trading, farming, brick making and tourism..	63
<b>Kalametiya</b>			
Gurupokuna (Gurupokuna GN)	Nearer the sea	Sea fishing, lagoon fishing, farming, business and government employment.	89
Thuduwa (Hungama GN)	Land-side of lagoon	Sea fishing, lagoon fishing, fish trading and casual labour.	123
Wewegoda (Bata-ata South GN)	Between sea and land-side of lagoon	Sea fishing, lagoon fishing, fish trading, farming, brick making, casual labour, and government employment.	121

### 4.3 Climatic conditions

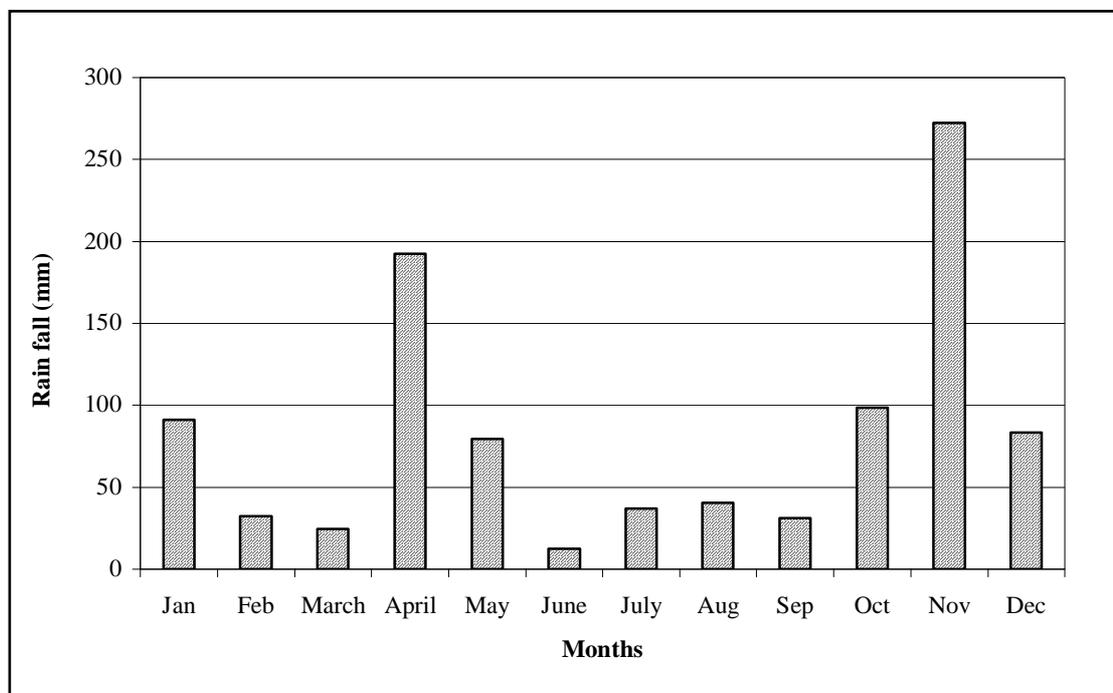
Climatic conditions are one aspect of the ‘vulnerability context’ in the SL framework (which includes all the dynamic external forces that influence people’s livelihoods that are usually beyond their immediate control).

As a result of Sri Lanka’s position between 5° and 10° North latitude, the rainfall patterns in the country are influenced by the monsoon winds of the Indian Ocean and Bay of Bengal. During the southwest monsoon, the winds originate from the southwest bringing moisture from the Indian Ocean, while in the northeast monsoon winds come from the northeast, bringing moisture from the Bay of Bengal. Inter-monsoonal periods follow each of the monsoons (Library of Congress, 2002). According to its annual rainfall, Sri Lanka is divided into three main geographic zones: a wet zone (where at least 50% of the days of the year experience rain), a dry zone (where less than 25% of the days of the year

experience rain and approximately 66% experience no rain) and an intermediate zone (IUCN Sri Lanka, 2004).

Based on this climatic zonation, the Rekawa area is situated in the intermediate zone, while Kalametiya is found in the dry zone of the country. As elsewhere in Sri Lanka, in the study area, rainfall is closely related to the prevailing monsoonal weather pattern in which two periods dominate: the southwest monsoon from May to September/October (called the ‘Yala’ or low cultivation season) and the northeast monsoon from December to February (called the ‘Maha’ or high cultivation season). The rainfall distribution over the year is seasonal. Most rain falls between the October-November and March-April inter-monsoonal periods and mid May - at the beginning of the southwest monsoon. In the case of Rekawa however, because it lies in the intermediate climatic zone, rainfall can occur throughout the year. (CEA, 1995; Ganewatte *et al.*, 1995). The monthly averages for 2001 to 2003 in the Hambantota district records April and November for the highest rainfall and the lowest rainfall is recorded for June (see Figure 4.2) according to data from the Hambantota Meteorological Department.

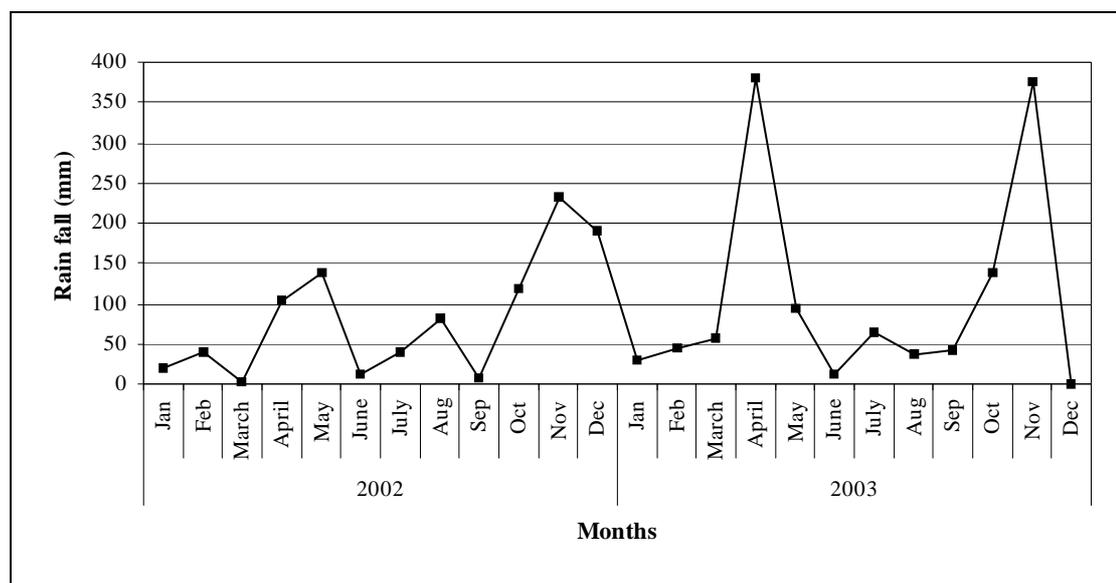
**Figure 4.2 Average monthly rain fall in Hambantota between 2001 and 2003**



The distribution of rainfall in the Hambantota district has varied widely over the years. There have been both ‘drought’ years as well as ‘flood’ years. A severe drought was prevalent in district from 2000 to 2002 and this was considered the worst drought to hit the district for over forty years. Recent flood years were reported as 1993, 1997 and 2003. The frequency of floods appears to have increased in recent years, possible caused by the expansion of irrigation in the central regions of the country which has reduced the capacity of soils to absorb rainwater (IUCN Sri Lanka, 2004).

Monthly rainfall for 2002 and 2003, which corresponds to Phase 1 and 2 of my fieldwork are depicted in Figure 4.3. Highest rainfall was received in the months of May and November during 2002 and in April and November during 2003; whilst the lowest rainfall was received during March and September in 2002 and June and December in 2003, based on data obtained from the Hambantota Meteorological Station.

**Figure 4.3 Monthly rainfall in the Hambantota District during Phase 1 and 2 of data collection (Hambantota Meteorological Station)**



The study area is subject to consistent and strong winds, especially along the coast. These high winds are most prevalent from June to September. These winds cause depositional sand formations all along the coast and help fill the natural lagoon mouths that connect Rekawa and Kalametiya lagoons to the sea. Over these four months of the year, high evaporation also takes place (Ganewatte *et al.*, 1995; Ratnayake, 1989). The temperature

in the study area is high and relatively uniform throughout the year, with a mean annual temperature of 27.9° C (IUCN Sri Lanka 2004).

#### **4.4 Village and household livelihood assets**

While there are five broad categories of livelihoods assets or ‘capital’ recognized by the SL framework (DFID, 2001a), not all these categories are covered in equal depth in this chapter as certain aspects are covered in the following chapters.

##### **4.4.1 Natural assets**

A range of natural resource uses are undertaken in the study sites. However, only those that are of relevance to my research are described here. Special attention is paid to fisheries related resources as this is the main natural resource use in the study site.

###### **4.4.1.1 Status of the marine environment**

According to a sub-tidal and inter-tidal biodiversity survey carried out under the GEF RUK<sup>15</sup> project, a total of 203 reef and reef associate fish species were recorded in the Rekawa and Kalametiya areas. While 155 species were visually observed on the reef, 48 species were recorded through fish catches (Perera and Weerakkody, 2004). Based on the observations made at the fish landing sites and local markets under the pilot phase of my study and according to the GEF RUK biodiversity assessment (Perera and Weerakkody, 2004), species economically important in terms of the near-shore fishery were noted as Sardines (Clupeidae), Anchovies (Engraulidae), Barracudas (Sphyraenidae), Shads (Pristigasteridae) and Jacks (Carangidae), while Groupers (Serranidae) are caught regularly on off-shore reefs. Other commercially important species include lobster – five species of spiny lobsters (*Panulirus* spp.) and slipper lobster (*Parribacus* spp.) that are found on the reefs and rocky outcrops close to shore.

In Rekawa, a shallow near-shore coral reef extends over about 300m, parallel to the coastline and encloses a reef lagoon which covers an area of about 1.5 hectares.

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<sup>15</sup> GEF RUK project - A four-year project (2001 – 2005) on the conservation of biodiversity through integrated collaborative management of the Rekawa, Usangoda and Kalametiya coastal systems, receiving funding from the Global Environmental Facility (GEF). The project was implemented by the Coast Conservation Department while the Facilitating Organisation was IUCN Sri Lanka.

According to Perera and Weerakkody (2004), the depth of the reef lagoon ranges from about 0.5m to 2.5 m and the bottom of the lagoon is composed of coral, rock and rubble substrates interspersed with large boulders of old limestone. The outer reef area is heavily degraded due to coral mining. In some areas, the reef is destroyed to the rock base. The GEF RUK biodiversity survey undertaken in early 2003 recorded that overall only 26% of the reef contained live coral, even though a significant number of fish and invertebrate species were observed (on the seaward side of the reef), in spite of the mining. However Perera and Weerakkody (2004) indicate that coral mining is likely to cause a loss of biodiversity and may have an impact on commercially important fish stocks that depend on the reef for part of their life cycle. Moreover, the destruction of the reef structure has resulted in high levels of coastal erosion in Rekawa plus left the coastline exposed to the sea's forces.

#### **4.4.1.2 Status of the lagoon environment**

##### **Rekawa lagoon area**

The Rekawa lagoon is shallow, with its western end connected to a deeper canal that regulates both inflow and outflow. The lagoon however does not have a continuous ocean connection because its mouth frequently closes through sand-bar formation. A branch of the Kirama oya, the major freshwater inflow of Rekawa lagoon forms a fairly complex network of channels before connecting to the mouth and the inflow-outflow canal. The hydrology of Rekawa lagoon is balanced by the influx of sea water when the lagoon mouth is open and fresh water entering from the Kirama Oya and the smaller Tangallu Ara. This maintains the brackish water environment within the lagoon. A mixed coastal mangrove belt of varying thickness found along the shoreline of the channel of the lagoon and the main basin, provide an important habitat for the post-larval and juvenile stages of crustaceans (such as *Panaeus indicus* and *Panaeus monodon*) and finfish (Ganewatte *et al.*, 1995; Ekaratne *et al.*, 2000; Dahdouh-Guebas *et al.*, 2005).

Irrigation developments taking place upstream from the lagoon have had an effect on the quantity of fresh water entering the system. With the operation of the Udawalawe irrigation scheme in 1967 to provide irrigated water in particular to paddy land, additional freshwater was diverted to Urubokka oya and Kirama Oya that are connected to the Rekawa lagoon. A study undertaken by Dahdouh-Guebas *et al* (2005) highlight that

changes in the hydrology of the system have increased the mangrove cover – clearly observed in aerial photographs of the area between 1956 and 1994. Mangrove species that are euryhaline (such as *Avicennia marina* and *Avicennia officinalis*) or that are tolerant to disturbances (e.g., *Excoecaria agallocha*) now dominate the lagoon area. Important and valuable *Rhizophoraceae* species have on the other hand declined in abundance. According to Dahdouh-Guebas *et al.* (2005), these changes in the mangrove assemblages can have a negative impact on the finfish and shellfish species found in the mangrove systems.

During FGDs with lagoon fishers in Boraluwagoda and Kapuhenwela another infrastructure related problem that was highlighted was the fact that the Kapuhenwela causeway constructed in 1984 by the Road Development Authority was causing a major impediment for the free flow of water in and out of the lagoon. The lagoon fishers were of the opinion that this causeway together with the upstream irrigation schemes has caused changes in the hydrology of the lagoon. This in turn they felt had affected the lagoon fish and shrimp fishery

### **Kalametiya lagoon area**

Historically, the Kalametiya lagoon hosted a thriving shrimp fishery in addition to other species of crustaceans and finfish (CEA, 1995). At times of high water levels, the narrow strip of beach that separates the lagoon from the sea would be breached, either naturally or manually. With respect to the latter, traditionally there was an agreement between the farmers and the fishermen that when the water in the lagoon was too high, particularly during planting and harvesting of paddy, the sandbar between the lagoon and the sea could be opened at the request of the farmers. The process benefited both the farmers by draining the fields and the fishermen by removing the sediment from the lagoon and thereby reducing the build up of waterweeds, maintaining the salinity, and recruiting fish and post-larvae shrimp. In this manner, the hydrology and productivity of the lagoon was regulated (Senaratna Sellamuttu and Clemett, 2003b; Clemett *et al.*, 2004).

As in the case of Rekawa, the quantity of fresh water entering Kalametiya lagoon increased dramatically after completion of the Udawalawe Irrigation Scheme. Water flows into the Kachchigal Ara, which feeds the lagoon, from branch canals originating from the Udawalawe Right Bank Canal (RBC) and from the Mamadala and Gurugodella

from the eastern side (CEA, 1995; Dahdouh-Guebas *et al.*, 2005). Focus group discussion undertaken with lagoon fishers highlighted that the conditions in the Kalametiya Lagoon altered greatly over the past 30 years - coinciding with the developments upstream with respect to the irrigation infrastructure in addition to the subsequent construction of a permanent outlet from the lagoon to the sea. These changes, according to the fishermen, have had serious negative impacts on the lagoon and its surrounding ecosystem. Maps drawn by fishermen during FGDs show dramatic differences in the current surface area of the lagoon compared to 30 years ago (Figure 4.4). Furthermore, it is commonly believed by the lagoon fishers that the increased inflow of fresh water has reduced the salinity of the lagoon, whilst the velocity of the outgoing water limits the exchange with seawater, further affecting salinity, and preventing recruitment of post-larvae shrimp (Senaratna Sellamuttu and Clemett, 2003b)

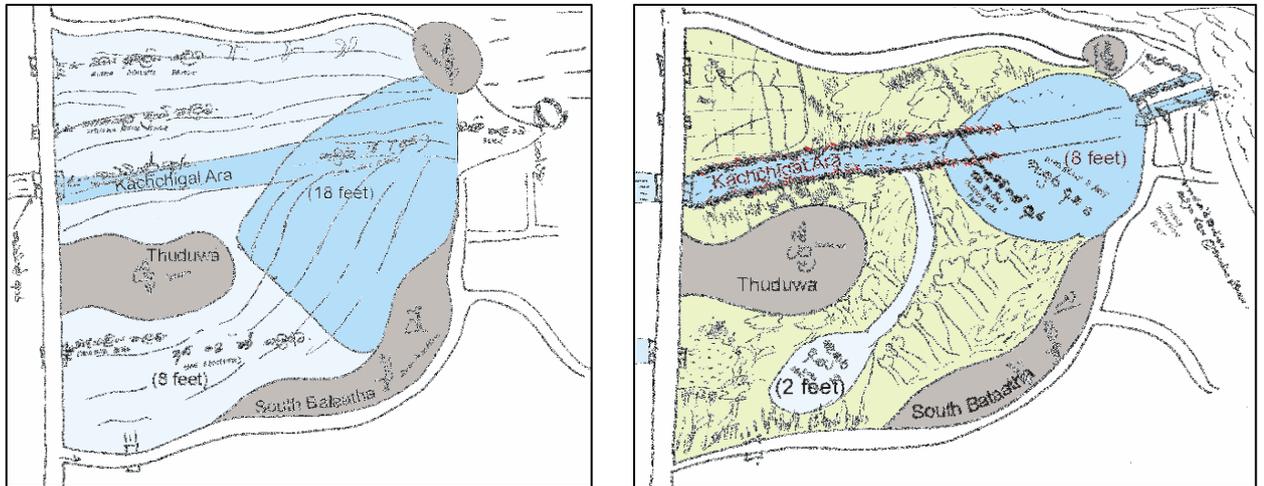
More recent engineering works, undertaken in the past few years have also influenced the condition of the lagoon. The two bunds built along the banks of the Kachchigal Ara have channeled the water directly towards the sea-outlet, preventing flooding of the land on either side of the bund, which was previously lagoon and marsh land. The result has been an increase in the extent of paddy lands but a sizeable decline in the extent of fish habitat and fishing grounds. The importance of the bund and the severity of the impact are starkly observed in the resource map (Figure 4.4).

An associated problem is the influx to the lagoon of sediment carried in irrigation water running off up-stream paddy lands. According to local fishermen the sediment has reduced the depth of the lagoon from about 18 feet to about 8 feet at the deepest point (near the mouth of the lagoon) and from about 8 feet to 2 feet in other areas. This has, they believe, reduced the number of areas where fish can find sanctuary and therefore contributed to over fishing. Sedimentation has provided conditions for the encroachment of waterweeds such as water hyacinth and *Salvinia* spp., further restricting the extent of the lagoon and reducing its navigability for fishing. These hydrological and environmental changes have had a considerable impact on livelihood activities carried out in and around Kalametiya Lagoon, especially lagoon fishing and paddy farming (Senaratna Sellamuttu and Clemett, 2003b; Clemett *et al.*, 2004).

**Figure 4.4. Participatory mapping showing the extent of the lagoon according to the fishermen, currently and in the past (Senaratna Sellamuttu and Clemett, 2003b; Clemett *et al.*, 2004)**

30 years ago

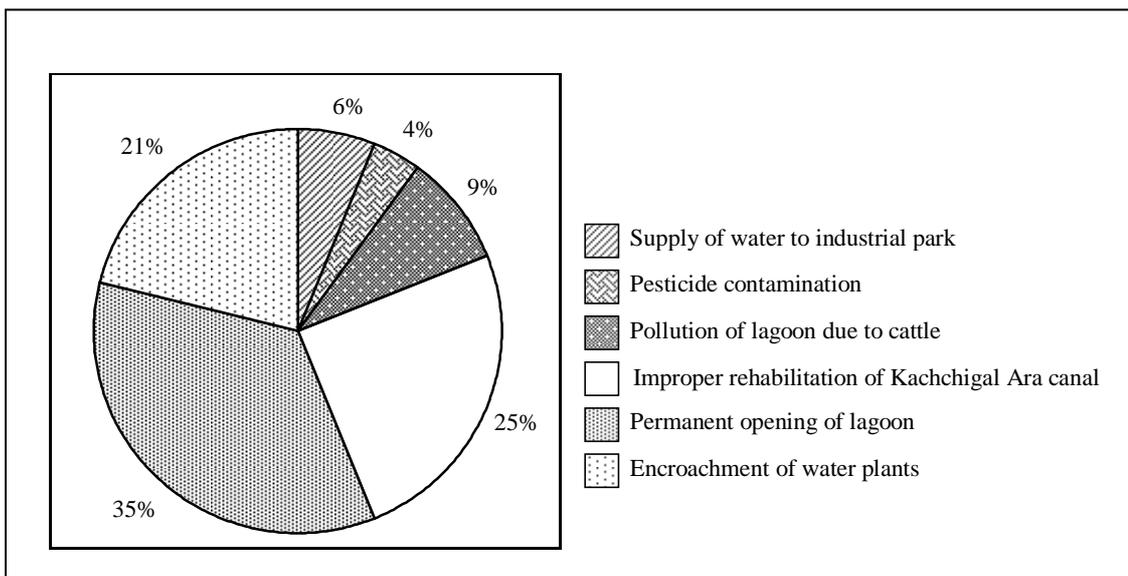
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Studies undertaken by Jayatissa *et al* (2002) and Dahdouh-Guebas *et al* (2005), show how changes in lagoon conditions as described by the lagoon fishermen, can be corroborated using aerial photographs of Kalametiya Lagoon taken in 1956 and 1994. The photographs clearly show a decline in the lagoon area with open water and its replacement by mixed mangrove species that are characteristic of low saline levels or euryhaline (e.g., *Sonneratia caseolaris* locally known as *kirala*). Remote sensing shows more than 75% of the lagoon is shallow (<0.5m) and muddy and covered by marsh vegetation, except the southern corner at the mouth, which has open water of about 1.5 m in depth. These changes are most prominent on the eastern side of the lagoon – the area most likely to be affected by changes in flow in Kachchigal Ara and by the bunds built along its banks. Some reduction is also observed on the western side near Bataatha South.

The fishermen were requested to score the reasons they provided for the change in the condition of the lagoon in terms of importance. The results from the three FGDs were similar, with the hydrological changes, i.e., the opening of the lagoon mouth and the rehabilitation of the canals receiving the highest scores. The encroachment of vegetation on the lagoon surface was scored third highest. The overall scores from the FGDs are shown in Figure 4.5.

**Figure 4.5. The percentage of importance given to each of the reasons cited by the fishermen for the change in conditions of the lagoon**



#### 4.4.2 Social and human assets

##### 4.4.2.1 Household size

In my sample, the mean household size in the six villages is given in Table 4.4. For comparison, the mean household size in Sri Lanka in 2000 was 4.2 (Department of Census and Statistics, 2002b). The household size for the sample population was obtained by using the number of members that had a meal together every-day as explained in Section 3.9.3.2. As elsewhere in the country, in my study site a household usually comprised of a nuclear family and included a husband and wife, children and sometimes the parents of either the husband or wife.

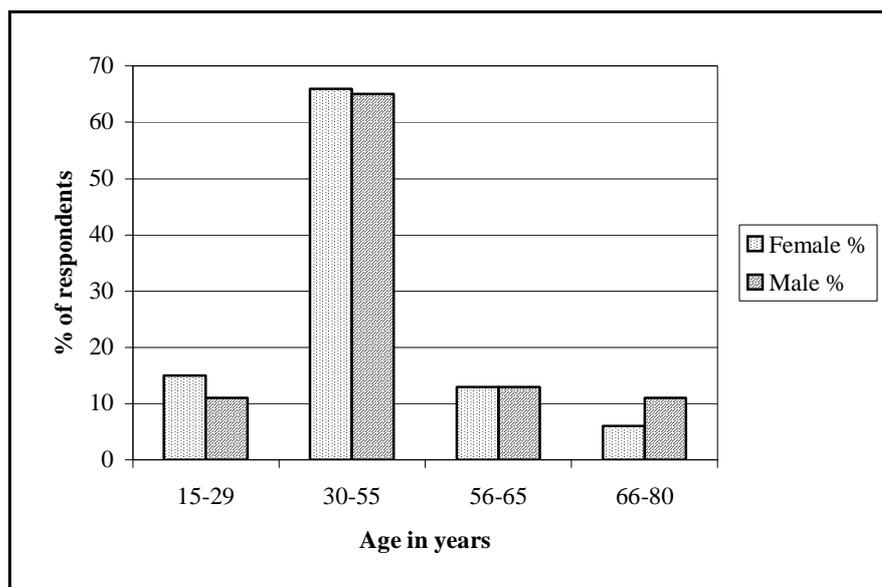
**Table 4.4. Mean Household size for the six villages**

Village	Mean Household size	Standard Error
Oruwella	3.76	2.16
Boroluwagoda	5.03	2.74
Kapuhewela	4.51	3.03
Gurupokuna	4.88	2.74
Wewegoda	4.87	2.74
Thuduwa	4.73	2.74

#### 4.4.2.2 Age of respondents

In my sample, female respondents ranged from 15 to 75 years and male respondents from 17 to 80 years in age. A majority of respondents fell into the 30 – 55 year age group, the main adult working force<sup>16</sup>. For both genders the lowest percentage of respondents fell into the ‘old’ category (Figure 4.6).

**Figure 4.6 Age of respondents in sample**

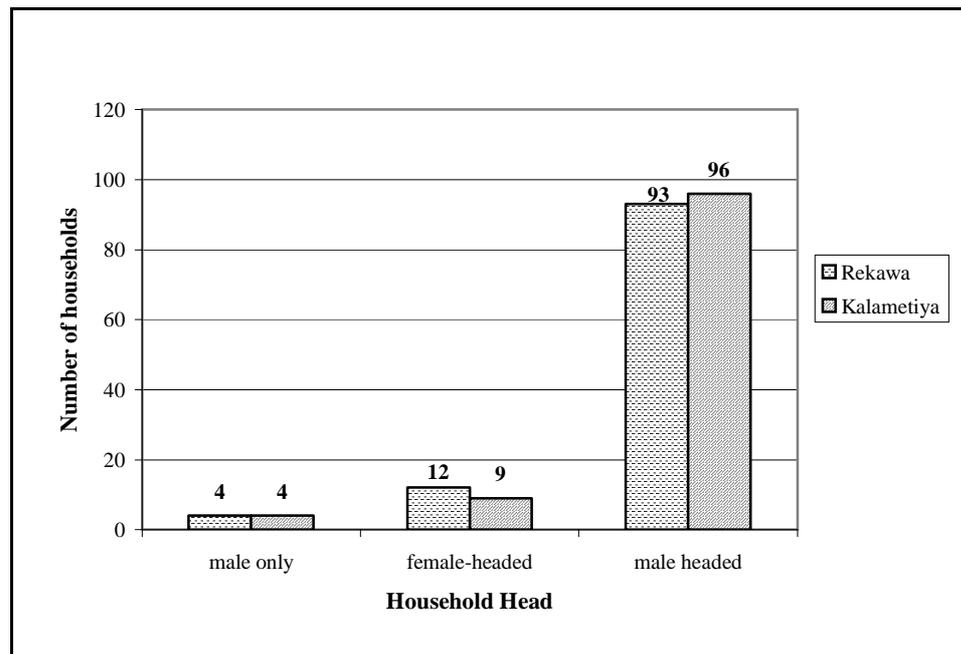


#### 4.4.2.3 Female and male headed households

In my sample, while a majority of the households have males as the head of the household, a little less than 10% of households are female-headed (Figure 4.7). This was generally due to the male being either deceased or in some cases, leaving the family. This group was considered to be more vulnerable to poverty. In about 3.7% of the sample the female in the household was employed abroad and therefore only the male respondent was available, or the older daughter acted as the respondent. As expected, these figures obtained at the beginning of my fieldwork, did not remain static over the data collection period.

<sup>16</sup> My sample was divided into the following age categories: 15-29 years – youth; 30-55 years – adult working force; 56 – 65 years – adults of a retiring age; 66 + years – old. This followed categorizations done by the University of Colombo, Department of Sociology in some of their work.

**Figure 4.7 Female and male headed households**



#### **4.4.2.4 Ethnicity and religion**

According to the personal well-being survey, the ethnic composition of the villages that formed the study site in the study site was 100% Sinhalese, which is the main ethnic<sup>17</sup> group in Sri Lanka. The religious composition was 100% Buddhists<sup>18</sup> – the main religion in Sri Lanka, with 76.7% of Sri Lankans practising Buddhism according to the 2001 census data (Department of Census & Statistics, 2002c). The village temple was of central importance to the community and almost all the households are actively involved in religious ceremonies and events taking place in the temple. The communities under investigation therefore formed a homogenous group in terms of ethnicity and religion. Thus there were no signs of tension in the study location resulting from either ethnicity or religion (Senaratna Sellamuttu, 2004).

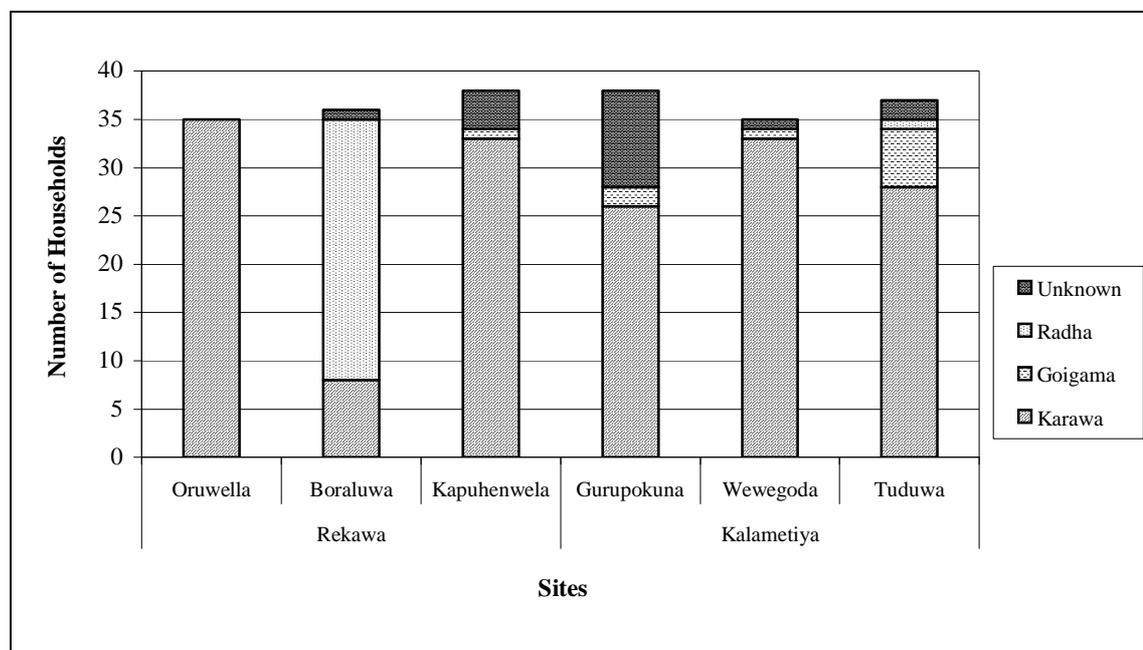
<sup>17</sup> In the Hambantota District, Sinhalese make up 97.1% of the population, while overall in Sri Lanka, the Sinhalese make up 81.9% of the total population according to the 2001 Census of Population and Housing (Department of Census & Statistics, 2001).

<sup>18</sup> In the Hambantota District, 96.9% of the total population practice Buddhism (Department of Census & Statistics, 2001).

#### 4.4.2.5 Caste system

In terms of castes, there were three that are prominent in the study site and these are: *Karawa* (fishing caste), *Goigama* (farming caste) and *Radha* (dhobi caste - washers). In the Sinhala caste system, *Goigama* is considered superior to the other castes while *Radha* is considered to be the lowest of these three (Hettige 1984). Since this is a coastal site, the *Karawa* caste is the dominant caste as expected (Figure 4.8). However, while the caste system was originally built on occupational groups in terms of livelihood activities, this did not appear to hold true in the villages in the present context and there was no significant relationship between caste and primary livelihood activity. For example those belonging to the *Radha* caste in Boraluwa are mainly engaged in lagoon fishing, while many of the *Karawa* cast in the Thuduwa village are now engaged in casual labour work. Depending on the status of the natural resources in their area and livelihood opportunities presented to them – people have diversified their livelihood activities and these may not reflect their original caste occupation. Correlation test also showed that there was no significant relationship between a household being either poorer or better off and their designated caste (see Chapter 5, Section 5.4.3.1.).

**Figure 4.8 Castes found in the study site**



#### 4.4.2.6 Ownership of land and type of housing

While the non-ownership of land is usually considered an indicator of poverty, in a rural setting such as my study site this does not appear to have a bearing since a high percentage of households do own a plot of land. Moreover, unlike in an urban poverty setting, the extent of land owned is also relatively high – for instance in Rekawa, 73.1% of households in the sample owned between 0.25 - 0.75 acres of land (see Table 4.5). Type of housing can also be considered an indicator of poverty and can be classified based on the materials used in its construction – for example the walls and roof. A majority of houses have tiled roofs with a relatively small percentage having the much cheaper thatched roofs (generally found among the poorest households). Likewise only a small percentage of the sample in both sites had wattle and daub mud walls. A slightly higher percentage of the sample in Kalametiya appeared to fall into this poorest category.

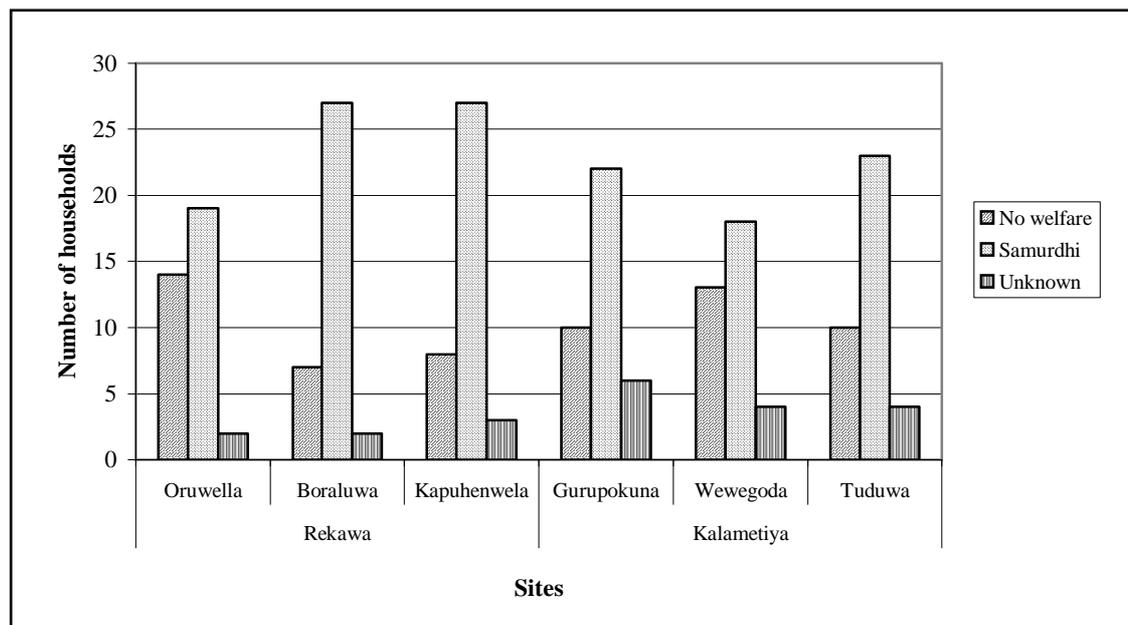
**Table 4.5. General housing characteristics of sample population**

Indicator		% of households in Rekawa (N=104)	% of households in Kalametiya (N=98)
Land	Own a plot of land	96.2	88.8
	Do not own land	3.8	11.2
Land extent	> 0.25 acre	0	11.2
	Between 0.25 - 0.5 acre	4.8	15.3
	Between 0.5 - 0.75 acre	22.1	19.4
	Between 0.75 - 1 acre	46.2	27.6
	Over 1 acre	26.9	26.5
House	Own constructed	96.2	89.8
	Purchased	3.8	0
	Shared ownership	0	4.1
	Other	0	6.1
Type of walls	Wattle and daub mud	3.8	7.1
	Brick	68.3	36.7
	Cement blocks	27.9	54.1
	Other	0	2.1
Type of roof	Asbestos	1.0	5.1
	Tiles	91.3	84.7
	Cadjan thatched roof	7.7	10.2

#### 4.4.2.7 Welfare beneficiaries

About 62% of my household sample was beneficiaries of Samurdhi – the Government welfare programme intended to help household's move above the national poverty line. Samurdhi was initiated in 1995 and is Sri Lanka's largest social assistance programme. The number of Samurdhi recipients in a village can be considered to reflect the poverty status<sup>19</sup> in the area. Welfare recipients were found in all the villages in my sample – according to my household survey information, the largest numbers being in Boraluwa and Kapuhenwela. Oruwella had the highest number of households that were not recipients of Samurdhi (Figure 4.9). However certain households were uncomfortable revealing whether they were recipients or not (classified as “unknown”) and therefore the overall figures may vary.

**Figure 4.9 Samurdhi welfare recipients**



#### 4.4.3 Physical assets

The infrastructure in Rekawa was set up more recently than that in Kalametiya and this is reflected in the case of water and lighting sources as more households in Kalametiya use pipe-borne water from the mains and have an electricity connection (Table 4.6). However

<sup>19</sup> Assessing poverty in an area through Samurdhi recipient numbers is debated by some practitioners as certain evaluations of Samurdhi have revealed that there may be improper targeting with as much as half the recipients not falling under the national poverty line (Tudawe, 2001). In my study, however Samurdhi is used to broadly categorise poverty in my sample and it is later tested against other measures of well-being (see chapter 5).

at the same time, there is a percentage of households in Kalametiya that use the lagoon for purposes of bathing and washing clothes (denoted by the ‘others’ category).

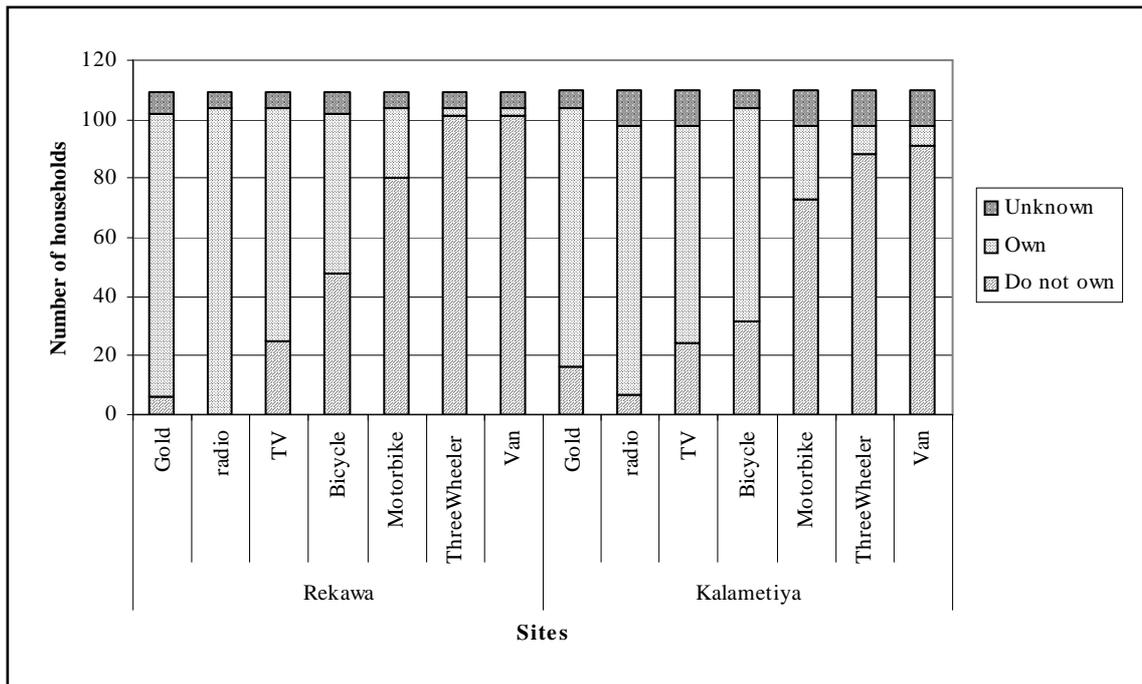
**Table 4.6 General sources of lighting and water for sample population**

Basic amenities		% of households in Rekawa (N=104)	% of households in Kalametiya (N=98)
Lighting source	Electricity	6.3	79.6
	Kerosene oil	33.7	20.4
Water source	Pipe borne	61.5	75.5
	Own well	0	1.0
	Stand post common pipe	38.5	3.1
	other		20.4

#### 4.4.4 Financial assets

In terms of household liquid assets, a similar pattern emerged for both sites (Figure 4.10). Almost every household owns gold jewellery – which is one of the first assets pawned during times of shortage. Radios, TVs and bicycles are the other most commonly owned assets, often even by those households that are considered poorer. Productive assets such as boats and fishing gear are useful indicators to differentiate between different wealth groups (see Chapter 5, Section 5.4.3.6). The distribution of boats in the study site is shown in Figure 4.12.

**Figure 4.10 Distribution of some household assets in Rekawa and Kalametiya**



## 4.5 Livelihood strategies

Within a household's livelihood strategy the most widely recognised component is income generating activities, which provide considerable information in terms of the natural resources used by a household and the effects that changes to these resources have on the household's livelihood strategy. In rural communities usually there is a diversification of livelihood activities undertaken by each household; where a number of activities may be carried out by one individual household member or overall there may be multiple household members engaged in one or more livelihood activity (Scoones, 1998; Ellis, 1999). These different livelihood activities may be categorised into primary and secondary income generating activities, of which the former usually contributes most to the household's overall income but the latter may take on a more significant role in times of stress (Senaratna Sellamuttu and Clemett, 2003a).

### 4.5.1 Primary livelihood activities

A similar pattern of primary livelihood activities are found in Rekawa and Kalametiya with the exception of coral mining and lime production, which is only undertaken in one village in Rekawa (see Table 4.7). Over 50% of my sample is involved in the fisheries

industry or related activities. Since this study is focusing on livelihoods dependent on natural resources, especially in relation to marine and coastal systems, the above mentioned two livelihood activities are described in further detail below.

The farming community in the sample is relatively small and comprises of about 5.7% of the total sample. Farming includes paddy cultivation, chena (slash and burn) cultivation and home gardening. In addition, cattle and buffalo rearing is also carried out.

In my study, 'self employment' includes livelihood-generating activities such as carpentry, brick making, sewing, owning retail stores, owning 'tea shops' and vehicle hiring (usually 'three-wheelers'). Kalametiya has a higher percentage of the population in the self-employed livelihood category. The 'labour' category refers to those engaged in casual labour as their primary livelihood and this could involve a range of activities from labour work related to agriculture (ploughing of fields and harvest time) to clearing of scrub land, shell mining and working on a daily basis at factories.

The private and government category include households that in general have a stable monthly income, which is generally predetermined and known to the households. Private employment in the study site includes working for private institutions, small scale tourist hotels and restaurants, the garment industry and local non-governmental organizations, while those in the government category would be generally working for local government institutions such as the Divisional Secretariat office and the armed forces. A similar percentage of the sample in both sites is found in the latter category.

While the categorization below depicts what households consider their primary livelihood activity, about 41% of the sample households currently obtain an income from more than just one activity according to my natural resource use survey results.

**Table 4.7 Breakdown of household sample by primary livelihood activities**

Primary Livelihood	% of households in Rekawa (N=105)	% of households in Kalametiya (N=105)	Total number of households	% of total sample
Fishing and related activities	49.6	55.2	110	52.4
Coral mining & lime production	9.5	0	10	4.8
Farming	3.8	7.6	12	5.7
Self employment	11.4	17.1	30	14.3
Labour	12.4	8.6	22	10.5
Private/Government	6.7	6.7	14	6.7
Retired	6.7	4.8	12	5.7
<b>Total</b>	<b>100</b>	<b>100</b>	<b>210</b>	<b>100</b>

#### 4.5.2 Fisheries

As mentioned above, fishing is the most prominent livelihood activity in my study site with over 50% of my sample engaged in the fishing industry. These households derive at least part of their income from the fishing industry, if not their total income. For example, of those engaged in the fishing industry, 52.5% in Rekawa and about 48% in Kalametiya derived their entire income from this sector. Of the fishing households about 55% are engaged in one-day near-shore sea fishing using either a traditional canoe (an *oruwa*) or 19.5 foot mechanized boat; 18% are engaged in lagoon fishing (only traditional crafts are used); 12% are engaged in both sea and lagoon fishing (using traditional canoes); 3% are engaged in sea fishing on multiday boats (45 foot mechanized boats with inboard engine) and 12% engaged in fish trading.

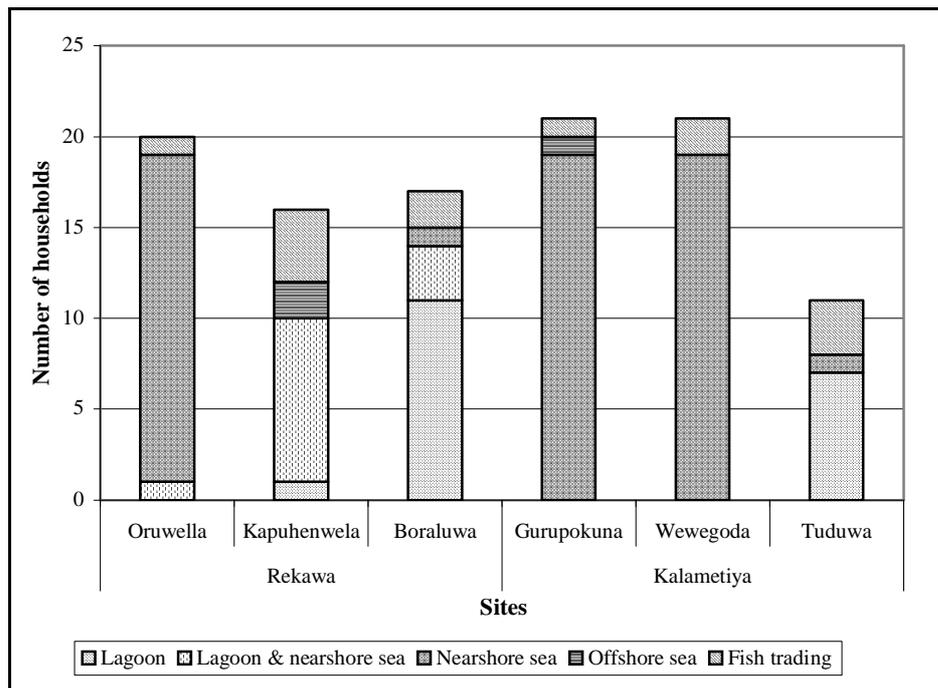
While in Rekawa, there are fishers who are engaged in both lagoon and sea fishing, in Kalametiya this was not the case in my sample households. Fish traders are found in each of the six villages (See Figure 4.11). As mentioned above there are different types of fishing crafts that are used in my study site and there were certain patterns observed in the different villages. For example FGDs and observations at the fish landing sites revealed that in Oruwella, the fishing fleet is almost entirely composed on 19.5 foot mechanized boats, while in Gurupokuna and Wewegoda there were also a fair number of traditional canoes that made up the fishing fleet. In Boraluwa, Kapuhenwela and Thuduwa only traditional canoes were used. A license is required for the operation of a fishing vessel (boat or canoe) and this is issued to the vessel owner by the local Fisheries Officer, from

the Fisheries Department. This is a means of regulating the number of boats operating in a particular area. According to the Fisheries Act of 1996, the license should be renewed on an annual basis.

A beach seine fishery (*madel*) also requires a license to be issued (for both the beach seine net and canoe). A beach seine fishery is found in Kalametiya and some households in Gurupokuna and Wewegoda are engaged in this fishery. Beach seining is carried out in coastal bays and in calm waters and requires a fairly large area of beach to haul the nets in manually. According to information obtained in the FGDs and observations, there are three *madel* operational in the Gurupokuna *kota waraya* (fish landing site) on a rotational basis so that during the fishing season, one *madel* operates each day. Each *madel* supports over 20 households. The owner of the *madel* obtains 50% of the catch income, while the balance 50% is divided among the other 20 or so “shareholders” that have a stake in the fishery through an informal agreement with the owner. These shareholders usually help with the operation of the *madel* boat and hauling in the net. In addition, about 20 more fishers may obtain a small proportion of fish in return for helping to pull in the *madel*.

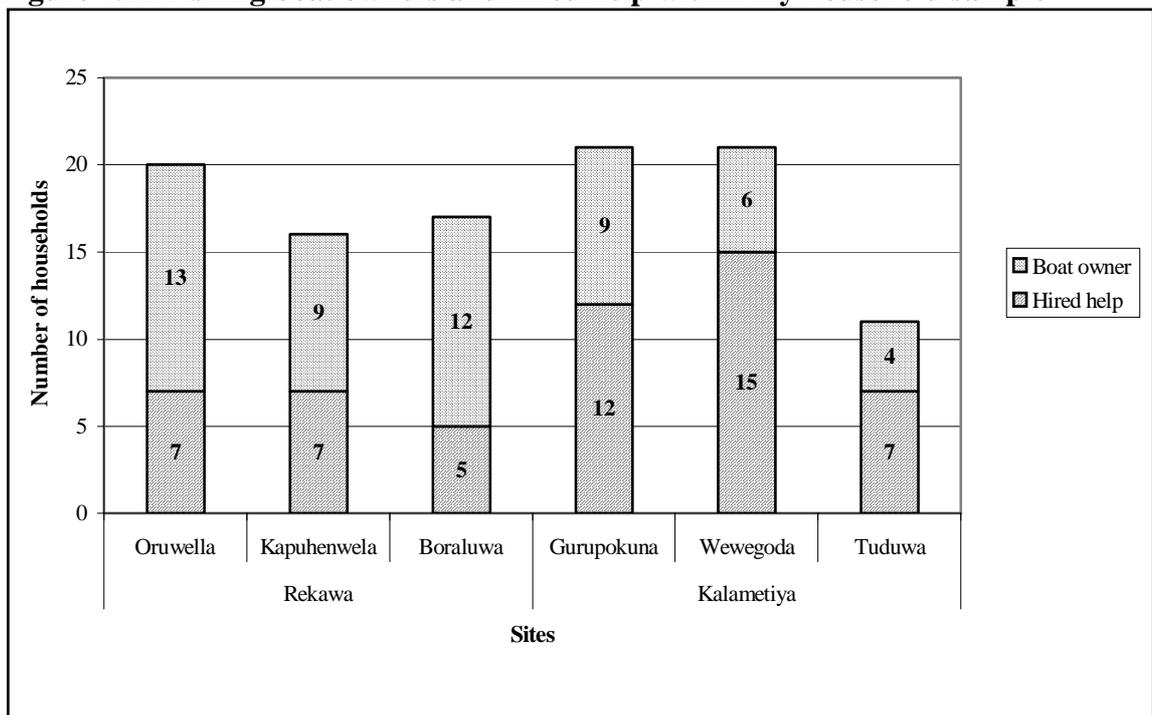
While a lobster fishery is found in both Rekawa and Kalametiya, there is a compulsory closure of the fishery enforced by the Fisheries Department for two months of the year (usually February and September) during the lobster breeding season to ensure that gravid females are not caught (Fisheries and Aquatic Resources Act, 1996). If caught breaking the law a fine of Rs. 10,000 – 15,000/= can be made. During the FGDs, the fishers stated that generally during the closure, they do not try to catch lobster as there is no market to sell their catch. Since the lobster fishery primarily supplies an export market, the company in Tangalle that purchases the lobster from the fishers is not operational during the closed season. However some fishers admitted that they caught lobster during the closure and raised them in cages close to rocky outcrops in the coastal areas until the ban was lifted.

**Figure 4.11 Different types of fisheries activities sample households are engaged in**



Not all fishers own a boat. Some are employed as hired help. In my sample Rekawa had a higher number of boat owners while Kalametiya had a higher proportion of hired help (see Figure 4.12).

**Figure 4.12 Fishing boat owners and hired help within my household sample**



In terms of fishing gear, almost all fishers utilize several different types of gear, based on the season and different types of fisheries engaged in (Table 4.8). For example, a variety of gear types such as bottom set gill nets (for lobster and rock fish), bottom set trammel nets (for prawns and rock fish), drift gill nets (for small pelagics) and light course surrounding nets (for small pelagics). The number of gear types used in a household in my sample ranged from 1 to 7 and different combinations of gear are used in the different villages. While most boat owners also have their own fishing gear, there are a few fishers who do not own their own boat but use their own fishing gear. There is no license issued by the Fisheries Department for the use different types of fishing gear.

**Table 4.8. Some of the main types of fishing gear used in the study site (source: pilot survey of fish landing sites, April 2002 and fisheries household survey, 2003).**

Fishing gear	Main species caught	Site
<b>Marine</b>		
Beach seine nets	Anchovy, Sardines, Wolf herrings, Indian Mackerel	Kalametiya
Drift gill nets (there are specific nets for Sardines, Anchovy, frigate tuna (alagoduwa)etc)	Anchovy, Sardines and frigate tuna (alagoduwa)	Rekawa and Kalametiya
Set gill nets Bottom-set gill nets for rock fish and lobster (pathule ellana del) Bottom-set gill nets for lobster (pokirisso del) Bottom set gill nets for prawns (isso del)	Lobster sp. , rock fish, groupers, prawns	Rekawa and Kalametiya
Trammel nets Bottom-set trammel nets for prawns (disco nets)	Prawn sp. Including Giant Tiger Prawn	Rekawa and Kalametiya
Surrounding net for small pelagics Light course nets	Anchovy, Scads, Indian Mackerel, Trenched Sardines, Barracudas and Wolf-herrings	Rekawa and Kalametiya
Rod and line		Kalametiya
<b>Lagoon</b>		
Drift gill nets	finfish such as mullet and milk fish	Rekawa and Kalametiya
Cast nets (visi del)	Shrimp sp.	Rekawa and Kalametiya
Jakotu (krall traps)	Shrimp sp.	Rekawa
Athanguwa (hand traps)	Shrimp sp.	Kalametiya

Although the coastal and off-shore fisheries are considered to be open-access resources, in reality, the near-shore coastal fisheries are accessible only to the communities living in that specific area. In the study site, local communities closely guard the “fisheries

grounds” and beaches close to their village and fish landing site (Silva, 1986). For example, in Kalametiya, during the FGDs it was mentioned that those engaged in near-shore coastal fishing using traditional canoes, would not allow fishers from another area fish in the same coastal waters in front of their landing site.

A similar situation exists with respect to the Rekawa and Kalametiya lagoons where access to resources are guarded by the local communities who are geographically located in close proximity to the lagoon and have utilised these resources over generations (Silva, 1986). The Rekawa lagoon was declared a Fisheries Management Area in 2000, under the provisions made in the Fisheries Act of 1996. The Rekawa Lagoon Fisheries Management Committee (RLFMC) was set up in 2000 to manage resource use within the lagoon (see Box 4.2). This was the first of its kind in Sri Lanka to be registered with the Fisheries Department, and involved lagoon fishers participating in the management of the resources they are dependent on.

In addition to the RLFMC, there are fisheries cooperative societies (FCS) operating within the study site. Interviews and FGDs with fishers indicated that these societies function at the village level (for example, Gurupokuna FCS and Tuduwa FCS) or at the GN level (for example, fishers from Oruwella belong to the Rekawa East FCS; those from Kapuhenwela belong to the Madilla FCS and those from Wewegoda belong to the South Batatha FCS). These FCS are the local institutional bodies that govern fisheries activities within each village or GN. They generally had a constitution and appointed office bearers that included a president, secretary and treasurer, that are elected on an annual basis by the society members. However the FCSs are not legally empowered to enforce the Fisheries Act, and can adopt punitive measures in regard to fisheries management issues only through exerting social pressure. The FCS usually provided fishers with specific loans to purchase fishing crafts and gear and this were considered to be their main function. During the course of my PhD research it was noted that certain FCS became inactive as a result of some members taking out loans without repayment and thereby creating a situation where other members were unable to obtain loans. These individuals appeared to have compromised the long-term sustainability and benefit of the FCS for the sake of short-term financial gain. The FCS played an important role during the post-tsunami rehabilitation of fisheries livelihoods (see Section 8.5.4.2).

### **4.5.3 Coral mining and lime production**

The mining of coral from the reef and burning of coral in lime kilns has taken place in Rekawa over several decades (Rekawa SAM, 1996). Coral is the main source of lime for the construction industry in Sri Lanka and sea coral mining increased in the late 1960s as a result of this, causing enormous damage to living reefs. The mining of coral reefs has also been linked to coastal erosion along the southwest coast (Berg *et al.*, 1998; CCD, 2004), and this resulted in the banning of sea coral mining in 1998 under the Coast Conservation Act. According to a survey undertaken in 1990 (by Ranaweera Banda) it was estimated that about 500 people were employed in the coral mining and lime kiln industry in the Rekawa area at that time. A survey undertaken in 1994 revealed that there were 51 lime kilns operating in the area (Ganewatte *et al.*, 1995). A more recent survey carried out under the GEF RUK project indicated that there were 40 lime kiln operating in the area in 2003 and 20% of these were operating in the Rekawa East area (where Oruwella is located). The monthly income of a lime kiln operator was estimated to be between Rs. 10,000 and Rs. 15,000 by the same survey (IUCN Sri Lanka, 2004). While the highest number of kilns were reported in the early 1990s, with the initiation of the SAM process the numbers decreased in the mid 1990s. During the SAM planning process, law enforcement was strong and lime kilns operating in the coastal zone were destroyed and heavy fines levied. Simultaneously, the communities were educated on the damage they were causing to the reef and the overall marine environment and also offered some alternate livelihood activities. This programme was however not successful and coral mining and lime kiln numbers increased once again in the late 1990s (Rekawa SAM, 1996; IUCN Sri Lanka, 2001). For a discussion on some of the factors that impeded the success of this programme see Box 4.1.

According to the findings of my natural resource use survey, 12 of the 35 households interviewed in Oruwella are at present engaged in coral mining or operating a lime kiln. Ten of the households interviewed indicated that they had been engaged in these activities for over 10 years, as there were few incentives to stop. Two households interviewed had taken up this activity recently to supplement their main income. Amongst the other reasons given for engaging in these activities, the fact that there were few alternate employment activities offered in the village was cited the most frequently. The lack of educational qualifications to improve their employability in other sectors was also mentioned. Unlike most coastal resource use practices in the area, coral mining and lime

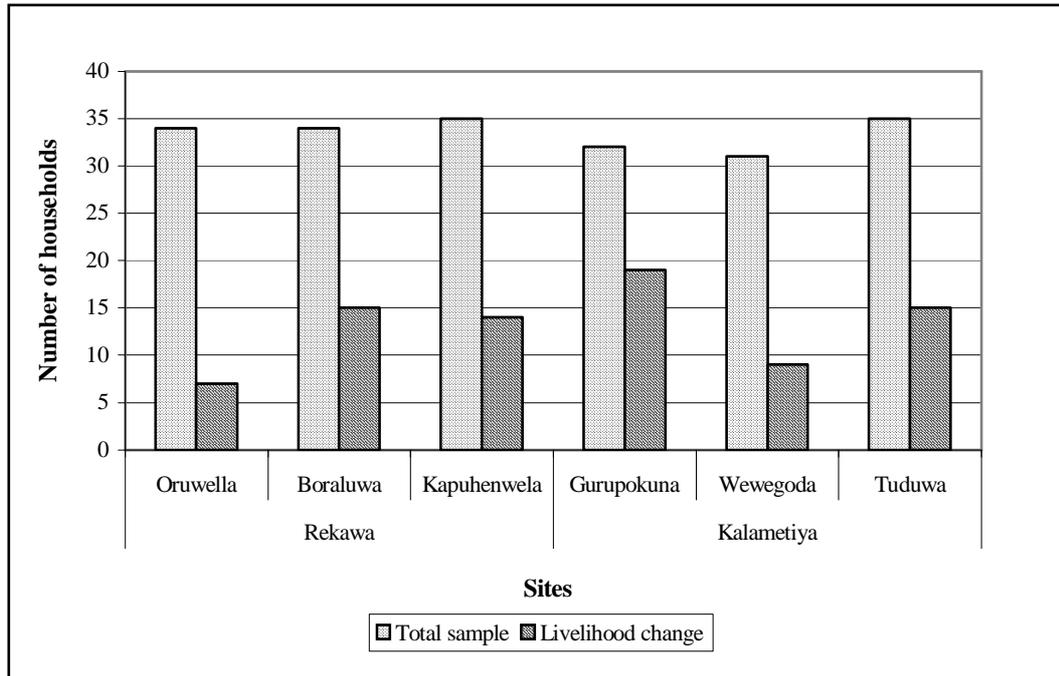
kiln operating were not confined to only males – both genders engaged in these activities. Of those interviewed, a higher number of females were engaged in operating the lime kilns. In fact many of the female-headed household in my sample were involved in this activity. In addition, FGDs with coral miners revealed that females were engaged in collecting the coral from the beach and also snorkeling and free diving to depths of about 2 – 3 metres to mine the reef. This was considered fairly unique in Sri Lanka, where these activities are usually confined to males. During favourable conditions, the divers remove large quantities of coral and transport these to shore – sometimes using make-shift rafts from tubes of tires. Usually between 2 – 4 hours per day may be spent mining the reef.

Households interviewed in Oruwella estimated that between 25 and 35 households in the village (little less than 50%) were engaged in coral mining or lime kiln operating during the time of the survey. While some households are engaged in both activities, others are only involved in one. From the findings of the survey and FGDs it appeared that those engaged in only coral mining, do this to supplement their income while those who operate the lime kilns usually do this as their primary livelihood activity. For example of those interviewed, eight households obtained over 70% of their income from the latter activity. While a majority indicated that they sold the lime they produced directly to consumers, there also appeared to be some traders who came to the village, although further details could not be obtained due to the sensitivity of the topic. All those who participated in the survey and FGDs indicated that they were aware that coral mining and lime kiln operating within the coastal zone were illegal activities, but that since no suitable alternatives were available to them, they had no option but to continue with these livelihood activities.

#### **4.5.4 Changes in primary livelihood activities**

During the time of the livelihood survey, 39% of the sample indicated that their primary livelihood activity had changed over the past 10 years (Figure 4.13). This included about 35% of the sample in Rekawa and as much as about 44% of the sample in Kalametiya.

**Figure 4.13 Changes in Primary Livelihoods over the past 10 years (Source: Livelihood Security household survey, 2002)**



While some of these changes were for personal reasons such as ill health and retirement, of the households that changed their livelihood activities, almost 50% did so because of problems related to changes to the condition of natural resources, either through natural processes or as a result of human intervention.

For instance, the livelihoods survey indicated that a large proportion of this shift is related to water availability, including changes in rainfall patterns and water management, which are making it increasingly difficult to earn an adequate income from traditional livelihood activities that are dependent on natural resources. For example, one of the main changes that have taken place has been a move away from: lagoon fishing, due to low shrimp and fish catches (caused by changes in the hydrology of the lagoons as described in Section 4.4.1.2); and the move away from agriculture, as a result of the drought conditions in the area at the time of the research and inadequate water supply for cultivation. Instead sea fishing, agricultural labour and service outside the area are being taken up, including seeking employment abroad.

The fishermen interviewed during FGDs in Kalametiya stated that in the past about 80% of the village were involved in lagoon fishing but this has declined to about 20%, because of the increased competition resulting from the scarce resources. They stated that the problems were mainly caused by changes to natural rainfall patterns and development of irrigation infrastructure, leading to factors mentioned in Section 4.4.1.2

The other major livelihood constraint cited in both Rekawa and Kalametiya during the livelihood survey was “lack of water”, with 57% of households suffering from insufficient water not only for the lagoons but also for agriculture and domestic uses, from both open water bodies and water supply schemes. It appears from discussions with the community that irrigation interventions and unpredictable rainfall patterns, usually resulting in insufficient rain, have been the cause of much of this, affecting water availability for at least the past five years. This has meant that 32% of those interviewed have been unable to cultivate their land and have been forced to undertake day labour in other areas or turn to sea fishing.

#### **4.6 Transforming processes – the Special Area Management process<sup>20</sup>**

Special Area Management or the SAM process can be considered one of the transforming processes functioning within my study sites and one way in which livelihoods and natural resources management issues are being addressed in the coastal zone (Senaratna and Milner-Gulland, 2002a). In Rekawa for example, SAM was intended to address: water supply to the lagoon; management of lagoon and marine resources; land use planning; and poverty alleviation and alternative livelihoods (RSAMCC, 1996).

The effectiveness of such an intervention can be measured in part by the community perceptions of the activities. The research projects found that 85% of sample households were aware of SAM, of which 61% had a positive impression of the process and activities, 21% had a negative impression and 18% knew of SAM but could not give details of it and were unaware of the possible livelihoods impacts.

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<sup>20</sup> Some of the information in this section can be found in Senaratna Sellamuttu and Clemett, 2003a.

**Table 4.9 Impression of the SAM process in Rekawa**

Village	Number of Households Aware of SAM	Number of households with positive impression	Number of households with negative impression	Number of households that could not explain SAM
Oruwella	28	9	16	3
Boroluwagoda	24	15	-	9
Kapuhewela	25	23	-	2
<b>TOTAL</b>	<b>77</b>	<b>47</b>	<b>16</b>	<b>14</b>

(where N= 91 households)

Those who could give details mentioned a variety of activities and positive or negative impressions appeared to be associated with the activities recalled. For example, in Boroluwagoda the 15 positive households associated the SAM process with the Rekawa lagoon fishery; in Kapuhewela the 23 positive households were of the impression that the SAM process was about the protection of mangroves and other natural habitats and wildlife; whilst all those who had a negative impression were from Oruwella village, which was at the centre of attempts to stop coral mining and lime production and there is still some resentment regarding this in the village.

Although under the SAM process, in addition to awareness programmes and law enforcement, a number of alternative income generating activities were initiated to compensate households engaged in destructive activities, they did not lead to a significant number of people taking up new livelihoods. In general the alternatives offered seem to have been introduced in an *ad hoc* manner and not to have sufficiently considered peoples skills, the potential income from each activity and the existence of and access to markets. Some of these livelihood enhancement initiatives as well as training programmes appeared to be serving more as an ‘entry point’ for the SAM process into the community, rather than as practical options for long-term alternate income generating opportunities (Box 4.1). Whilst to ensure long-term sustainability recommended livelihood activities should ideally be based on in-depth feasibility studies.

**Box 4.1. Alternate livelihood development activities – lessons learned from the Rekawa SAM site (adapted from CERM, 2004)**

With the objectives of reducing poverty and as well as weaning away individuals engaged in destructive resource use practices, a number of alternate income generating activities were introduced under the Rekawa SAM process. These included poultry farming, rabbit and goat rearing, coir rope making, bee keeping, providing agricultural assistance, and sewing (Senaratna Sellamuttu and Clemett, 2003a; Clemett *et al.*, 2003).

Overall these income generating initiatives appear to have had limited success with very few people continuing such activities. For example, in December 2002, of the 45 coir rope making machines, only about 25 were operational mainly as a result of difficulty in tapping the market; of the 5 households that were introduced to poultry farming only one household was continuing with this due to various reasons. The rabbit farming failed because the climate was unsuitable. A group of women engaged in coral mining explained that they were taught how to make sweet meats and clothes, but of those trained only one has continued with dress making as there were not enough members in the community to support more than one dressmaker in the village and they did not have access to external markets to sell their products. In general, alternate income generating activities appear to have had an extremely low success rate, predominantly because they were poorly thought through and were insufficiently based on existing resources, skills and access to markets. No monitoring process was set up under the SAM process to evaluate whether these income-generating activities were actually implemented successfully at the field-level (Senaratna Sellamuttu and Clemett, 2003a; Clemett *et al.*, 2003).

Moreover, it is also observed that unsustainable resource use practices such as coral mining only stopped during the Rekawa SAM implementation phase due to a combination of law enforcement, education programmes and alternate livelihood initiatives being introduced at the same time. Therefore it appears that realistically these other elements are also necessary to ensure the success of the alternative income generating activity, especially with respect to communities engaged in destructive resource use practices (CCD, 2004).

The decline in lagoon fishing was addressed very differently under the SAM process, with efforts to rehabilitate the lagoon, and address over-fishing and destructive fishing practices through establishment of the Rekawa Lagoon Fisheries Cooperative Society (RLFCS) in 1995. This was the first lagoon fishery society to be registered with the government in Sri Lanka. Unfortunately by the late 1990s the society was no longer operating, for a number of reasons, which according to some society members, included mismanaging funds accrued from membership fees (Box 4.2). This and other issues resulted in the members losing faith in the society (Joseph and Kumara, 2001; Senaratna and Milner-Gulland, 2002b).

In early 2000 the fisheries society was revived with the support of a GTZ funded community fisheries project and the Rekawa Development Foundation, a community based organization formed under the SAM process. The fisheries society was renamed the Rekawa Lagoon Fisheries Management Committee (RLFMC) and a new fisheries

management plan was developed with the full collaboration of the members (Joseph and Seneviratne, 2000; Joseph and Kumara, 2001). Consequently there appears to be a fair degree of positive thinking among the committee members that this may result in a more dynamic organization that plays an important role in lagoon resource management and sustainable livelihoods (Box 4.2).

The RLFMC offers several generic lessons about community mobilisation for resource management that are applicable to other resource user groups within the SAM process.

For instance:

- For societies to function effectively, they should be a naturally forming group based around existing assemblages, such as livelihood groups or social groups. In many cases it is beneficial to support traditional groups but in cases where there are existing problems it may be necessary to form a new group.
- It is important to establish mechanisms to enable resource user societies to be self-sufficient. Over reliance on external sources of funding provides cooperatives with a false sense of security. External technical and financial assistance may be necessary during the initial phases but societies should be taught how to remain self-sufficient after donor funding ceases.
- Financial transparency should be promoted as a management norm to minimize the possibility of corruption or mismanagement, as this could ultimately cause the resource user societies to collapse.
- Where conflicts over resource use arise, conflict resolution techniques should be employed and members of societies trained in conflict resolution and mitigation.

**Box 4.2 Community management of the Rekawa lagoon resources [adapted from Senaratna and Milner-Gulland (2002b)]**

**Shantha** and **Dhayaratne** live in the Boroluwagoda village adjacent to the Rekawa lagoon and have been fishing in the lagoon for many years. The Rekawa lagoon hosts a community of fishers engaged in a shrimp fishery using traditional non-mechanised boats, nets (cast nets and drift gill nets) and traps (*jakottu* or krall traps – passive traps made of interwoven bamboo panels). Predominantly *Panaeus indicus* and smaller quantities of *Panaeus monodon* are harvested (Ekaratne *et al.*, 2000).

While Dhayaratne is involved exclusively in lagoon fisheries, Shantha is also engaged in sea fishing (lobster fishery and as well as near-shore fishery of small pelagics), during part of the year. Both were members of the Rekawa Lagoon Fishery Cooperative Society from the time its inception. Lagoon fishers belonging to all seven *Grama Niladari* divisions under the Rekawa SAM plan became members of this society. According to Dhayaratne, the forming of the lagoon fisheries cooperative society was induced by the talk at the time of outside businessmen selecting the Rekawa lagoon as a site for a large-scale shrimp farming effort. “As we believed that this action may have a negative impact on our traditional lifestyle, we decided to form the fisheries society so that we could express our disagreement to this idea as a united force,” stated Dhayaratne.

The RLFCS later participated in shrimp catch monitoring exercises conducted by the National Aquatic Resources Research and Development Agency (under the Ministry of Fisheries and Ocean Resources) and the University of Colombo and thereafter were active participants in the tiger shrimp (*Panaeus monodon*) restocking and harvesting programme carried out by the University of Colombo (Ekaratne *et al.*, 2000) in July 1996 and July 1997. Rearing cages with post-larval shrimp were placed in the lagoon and later released. Dhayaratne, who participated in this exercise said, “We were educated on the life-cycle of the shrimp. When I first saw the small post-larvae, they looked more like little spiders to me, it was difficult to imagine that this is what turned into tiger shrimps!” The society also set up a small shop where their fish catch could be stored and sold directly to consumers and hoteliers instead of going through middlemen, thereby ensuring better prices for the fisher communities. A deep freezer was acquired for fish storage (Ekaratne *et al.*, 2000). There are three types of fishers in Rekawa, based on the fishing gear used (*jakottu*, caste nets and drift gill nets), and the society also helped resolve conflicts arising between the three groups as well as implement the Rekawa lagoon fisheries regulations that formulated in the 1980s based on a commission that was set up to look into disputes between the three fisher groups (RSAMCC, 1996; Joseph and Kumara, 2001). The society was however not as successful as originally envisaged under the SAM planning process, and was defunct by the late 1990s.

With the assistance of the RDF and a GTZ funded community fisheries project, in early 2000 attempts were made to resurrect the Rekawa fishers society and implement a fisheries management plan for the lagoon. A new *Rekawa Lagoon Fisheries Management Committee* (RLFMC) was thus formed in Rekawa in February 2000 at a meeting attended by over 100 fishermen (Joseph and Seneviratne, 2000; Joseph and Kumara, 2001). In principle the fishers viewed the cooperative in a positive light and were keen to engage with it in its new form. Shantha hoped it would prove to be a beneficial body to enhance the livelihoods of the lagoon fishers. “At present economically it is very difficult for us; the lobster fishery has been banned for the last month and there has been no shrimp fishery this year in the lagoon due to the drought I believe, and also fish catches are very low. I hope we can organize another shrimp restocking programme in the lagoon through the new fisheries management committee”, said Shantha.

In Kalametiya, although the SAM process was initiated in November 2001 (KSAMCCC 2004), awareness of the SAM initiative within the villages was relatively low initially. For example a survey carried out in April – May 2002 (survey 1) with my household sample in Thuduwa, Gurupokuna and Wewegoda revealed that only about 34.1% of my sample were aware that Kalamatiya was a proposed SAM site and an even smaller number of households (about 9.8%) were aware of what the SAM process involved and

how it would impact their lives. A subsequent survey undertaken during July – August 2003 (survey 2) with the same sample of households showed a marked increase in awareness regarding the SAM process, with a total of 42% expressing their views on SAM. While 60% of households had a positive opinion of SAM, 40% had a negative perception (see Box 4.3 for some reflections of the Kalametiya SAM process at the community level).

Educating the different community groups on the importance of coastal resources and their wise management was considered to be a positive outcome of SAM. The aims of the SAM process to conserve and properly manage the coastal resources and ecosystems including the lagoon had also raised hopes among lagoon fishers; those interviewed hoped that the lagoon would be rehabilitated and possibly a shrimp restocking programme initiated under SAM. In addition the fact that SAM would help poor households by providing them with sanitation facilities and rainwater harvesting tanks, as well as providing alternate livelihood activities was welcomed by community members. Some of the households had already participated in training programmes initiated under the project.

### **Box 4.3 Community perceptions on the SAM process – some reflections from the Kalametiya SAM site (adapted from CERM, 2004)**

Thuduwa is one of the eight villages found surrounding the Kalametiya lagoon and it falls within the Kalametiya SAM site. Under the CERM project, at the village-level a community development committee has been formed in each of these 8 villages, including Thuduwa and these 8 village-level committees together form the Kalametiya Community Development Foundation (KCDF), which in turn is a member of the Kalametiya Special Area Management Community Coordinating Committee (KSAMCCC), which is set up under the chairmanship of the Ambalantota Divisional Secretariat (KSAMCCC, 2004).

Although the SAM process was initiated in Kalametiya in November 2001, awareness of SAM was initially relatively low. There were also incorrect perceptions of SAM at the village level at the beginning. For example, Nandaseeli, treasurer of the Thuduwa community development committee stated,

*“Although I knew the Thuduwa village committee had been set up in 2002, I did not join the committee until about one year ago as I was initially under the impression that this was a politically motivated group, since almost all the original members belonged to one political party and were active in politics. However once I came to know through other community members that this was not the case, I became a member of the committee and was later appointed as Treasure. I am glad that I joined the committee now as I think the village is benefiting though the village-level initiatives been undertaken...”*

The above statement illustrates how certain misconceptions regarding the SAM process can potentially alienate certain groups within the community. One way of addressing this issue is to increase awareness on the SAM process and its merits and clearly demonstrate that the SAM process is essentially for everyone – regardless of their social status or political affiliations. This idea can be further strengthened if the village committees operate under a constitution, as in the case of many other village societies, where office bearers are re-elected once a year (or once in two years), by committee members.

Initially while there were about 25 members in the Thuduwa village development committee, this number has now increased to about 75 members, perhaps as a result of villagers realizing that in general only committee members appeared to be entitled to receiving benefits under this programme, while non-members are excluded. A membership fee is levied by the committee and although only Rs. 105/= per member, this posed a problem to poorer households. These households were later given the option of paying the fee in installments.

While Chandrakumara, secretary of the village committee, as well as a CCC member, stated that the CCC provided a unique forum for community members to express their views and discuss their problems, he felt that some improvements needed to be made to the procedure to expedite decisions agreed upon by the CCC and avoid delays in implementation. Although SAM activities (as proposed in the SAM Action Plan) were known among the CCC members in the village, there was no formal means of educating the rest of the village on these interventions and it is therefore important that greater emphasis is placed on awareness creation at the community level in regards to the SAM process and its actions.

The main complaints against SAM during the time of the second survey (see Table 4.10) were to do with the fact that although it was expected to assist the poorest in the village, this had not always been the case. For example, those interviewed stated that the process of selecting beneficiaries for the rainwater harvesting tanks and sanitation facilities had not been transparent at the village level. At present some were of the opinion that only

office bearers on the village level committees and their associates had benefited from these programmes. There was disillusionment expressed due to these amenities not been distributed in a fair manner - to the poor and most needy. Many were of the opinion that better leadership was required and that office bearers should be fair and honest to ensure that the entire village benefits, not just certain groups. Some respondents also indicated that some of these village committees had been politicized and only those belonging to the same political party were receiving benefits.

**Table 4.10 The impression that households had of the SAM process in Kalametiya**

Village	Survey 1		Survey 2		
	Aware that Kalametiya is a SAM site	Aware of SAM process	Aware of SAM process	Positive impression	Negative impression
Gurupokuna	11	8	12	8	4
Wewegoda	8	0	14	7	7
Thuduwa	9	0	16	10	6
TOTAL	28	8	42	25	17

(where N for first survey = 82 and second survey = 99)

Overall of my sample, 40% in Rekawa and 42% in Kalametiya indicated that they were involved in the SAM process. While almost 100% of those involved had done so in the capacity of participating in village level meetings held with respect to the SAM activities, in addition to this, in Boraluwa and Kapuhenwela respondents indicated that they have been involved in the lagoon fishery cooperative society through the SAM process.

Of those involved in SAM, only 45% indicated that they had benefited from participation in Rekawa while in Kalametiya it was slightly lower – 38% during the time of the survey. In Rekawa the main benefits cited were developing the Rekawa lagoon and initiating a shrimp restocking programme, setting up of the Rekawa lagoon cooperative and being educated on the importance of the sound management and conservation of coastal resources. Two respondents indicated that they had also been beneficiaries of the alternative livelihoods programme. In Kalametiya in addition to citing the advantage of being educated on coastal resource management issues, four respondents had participated in the livelihood training programmes initiated under SAM, while two respondents were recipients of the sanitation programme and one a rainwater harvesting tank. Since the survey was undertaken at the preliminary stages of the SAM process in Kalametiya it

would be useful to repeat the exercise to determine how people view the process at present.

It appears that for the individual, participating in SAM was based upon receiving certain tangible benefits from the process at the individual or household level, for example, a poor household receiving sanitation facilities. Even in the case of actions that clearly benefited a larger segment of the community, unless benefits were also accrued on an individual level, the action was unlikely to be thought of as being of any benefit [for example, shrimp restocking programme in Rekawa being beneficial to all lagoon fishers. But while fishers were educated on the fact that shrimp should not be caught until they had reached a certain size and this was determined through the cooperative society, some fishers continued to catch small size shrimp. Those who had not caught shrimp during this time (i.e., not broken the rules) thereby stated that the restocking programme had not been of any benefit to them personally].

Since beneficiaries were measured in terms of those who had received tangible benefits at the individual level – as the SAM outreach programmes (in respect to alternate livelihoods, sanitation facilities, rainwater harvesting tanks and so on) involved very small recipient numbers relatively, the perception at household level was very often that they had not benefited (even though there may have undoubtedly been overall benefits accrued by the community by SAM – for example, better management overall of the coastal resources they were dependent on).

**Table 4.11 Households involved and benefiting from the SAM process**

<b>Village</b>	<b>Involved in SAM</b>	<b>Benefited from SAM</b>
<i><b>Rekawa</b></i>		
Oruwella	10	2
Boroluwagoda	19	10
Kapuhewela	13	7
<b>TOTAL</b>	<b>42</b>	<b>19</b>
<i><b>Kalametiya</b></i>		
Gurupokuna	12	4
Wewegoda	14	1
Thuduwa	16	11
<b>TOTAL</b>	<b>42</b>	<b>16</b>

(where Rekawa N=104 and Kalametiya N=99)

This chapter has set the stage for the main analyses chapters (Chapter 5, 6 and 7) by providing some background to the study site and the sample population and to the different processes such as SAM that are operational in the sites. Chapter 5 which follows, tests the relationship between these different demographic, livelihood-related and CZM policy related factors and the different dimensions of poverty that exist at the household level.