Chapter 3
Methodology

3.1 Background

This chapter presents an overview of the methodology I have adopted for data collection and analysis in my study. A combination of participatory approaches and more conventional survey methods were used to gather the data required to answer my research questions. Data were collected with the assistance of local field researchers and divided into three phases.

3.2 Variables to be measured

My research aimed to investigate the socio-economic and policy factors influencing rural coastal livelihoods dependent on natural resources and through this the poverty issues that particularly affect rural coastal communities. While I adopted a sustainable livelihoods approach as an overall conceptual framework, I focused on mainly two aspects of livelihood security - food security and personal well-being. The unit of analysis I use is the household level to ensure that I have adequate data points to obtain an appropriate statistical power for my study. However data was also collected from the village level through to the national level in relation to certain factors. Data on a range of issues were gathered in order to obtain the necessary background information to address my three broad research objectives (see Figure 3.1 for an overview of all the variables that were measured and how data was collected in each case).

3.3 A review of data collection methods applied

In my study while the research was inherently extractive as a result of it being a doctoral thesis, suitable participatory data collection methods were used at every stage of the research, together with more formal statistical surveys.

Participatory research methods are considered to be 'people-centred' approaches that allow local communities to share, enhance and analyse their knowledge of life and conditions, thereby enabling them to express their needs and concerns (Chambers, 1992; Chambers, 1994; Malleret-King, 2000). The extent of participation by the community in

the research can be to varying degrees. At one end of the spectrum they may be merely consulted. At the other end, they may generate their own knowledge with no input from formal researchers. The most balanced is considered to be collaborative research where, as in collaborative management, the community and the researchers work closely in partnership, and the skill, knowledge and experience of the formal researchers are combined with those of the community in a relationship of equal power. The degree of participation and the stage of participation in the research cycle may vary a fair amount depending on the type of research being carried out and the specific aims or the research project (Campbell and Salagrama, 2001; Whittingham *et al.*, 2003; Senaratna, 2003). The degree of participation (Table 3.1) has been described by a number of authors such as Biggs (1989), Pretty *et al.* (1995) and Campbell and Salagrama (2001).

Table 3.1 Different degrees of participation in research (adapted from Biggs 1989)

Type	Level of Participation
Contract	Formal researchers use the facilities or resources of the coastal community to carry out their research.
Consultative	The formal researcher consults the coastal community to identify issues, but the community plays a fairly passive role.
Collaborative	The formal researcher and the coastal community work together in designing and carrying out the research.
Collegial	The formal researcher actively encourages the initiation of research by the coastal community where the latter play a major role in designing the research, implementation and analyzing results.

The idea of research partnerships between communities and formal researchers is not new and emerged in the 1970s at a time when top-down industrialization based development did not appear to have the expected results, especially in relation to reducing poverty. Reviewing development policies invariably led to the re-evaluation of conventional research methods that generated results on which decisions were based (Nelson and Wright, 1995). It became clear that the poor had a wealth of knowledge about their natural environment and their social situation and therefore involving local people in research meant that the interpretation of research results were likely to be more accurate. By the late 1990s, the concept of 'community participation' had become essentially the orthodoxy in development practice, especially in the case of rural development (Stirrat, 1996; Foell *et al.,* 2000). On the policy front, buzzwords such as 'participation' have

become common place in international development and poverty reduction policy strategies (Cornwall and Brock, 2005).

The formal research process thereby evolved to incorporate a wide range of participatory tools that facilitated greater involvement of the local community, especially the poor. Many of these techniques combine to provide distinct participatory approaches such as Participatory Rural Appraisal (PRA), Participatory Action Research (PAR), Participatory Research (PR), Participatory Learning and Action (PLA) and Participatory Assessment, Monitoring and Evaluation (PAME). Although these approaches differ in how they originated and for what purpose (see Table 3.2), there is a fair amount of overlap among them and often a selection of complementary participatory techniques are used together in the field (McCraken and Narayan, 1998; Campbell and Salagrama, 2001; Whittingham *et al*., 2003). In general it is now accepted that participatory approaches and partnerships in development are essential for improving the livelihoods of the poor (McCraken and Narayan, 1998).

Table 3.2 A comparison of some participatory approaches (adapted from Campbell and Salagrama 2001)

Approaches to participation	Key features
Participatory Rural Appraisal (PRA)	PRA enables people to articulate and analyze their situation in order to plan, implement, monitor and evaluate their actions. The underlying concept is that local people are capable of analyzing their own realities and that the outsiders should have the role of facilitators of the development process. It is a shift from extractive research to empowering and facilitating active local participation.
Participatory Action Research (PAR)	In PAR the community is assisted to formulate a critical analysis of their own situation: their problems, weaknesses, needs, strengths and resources. Identifying and consolidating the knowledge and skills poor people already possess, enables them to use these tools for their own empowerment. Historically PAR represented a fairly stand-alone approach to participation, where by building on the capacities of the disempowered they had the opportunity to make their own changes.
Participatory Research (PR)	PR involves community members in the research process to varying degrees. For example the community may be contracted by the external researcher or may collaborate in some aspects of the research such as data collection or analysis. In more advanced PR, the community has control of the research process. Indigenous knowledge is closely associated with the PR approach.

Approaches to participation	Key features
Participatory Learning and Action (PLA)	PLA is a technique that places more emphasis on mutual learning, attitudes and behaviour of researchers, and taking action on the outcomes.
Participatory Assessment, Monitoring and Evaluation (PAME)	PAME is an approach based on the assumption that beneficiaries of project interventions monitor and evaluate these interventions either by adopting changes or discontinuing these changes as soon as external inputs are withdrawn. This is a people-led approach and gender is incorporated.

While a majority of participatory approaches were developed in relation to agricultural systems, they have been used extensively in the natural resource management sector and been adapted to study coastal systems including fisheries (Townsley, 1993; Ira, 1997; IIRR, 1998; Bunce *et al.,* 2000). In recent years more collaborative approaches to research in small-scale coastal fisheries have been adopted although to date there appears to be little real experience beyond involving communities in the data collection phase of the research. Some of these approaches it appears have started to produce some benefits to the local people in terms of empowerment, knowledge sharing and development projects that are more attuned to the priority needs of the community (Campbell and Salagrama, 2001; Senaratna, 2003) although serious shortcomings do still exist (Foell *et al.,* 2000).

In participatory methods, interviews are mainly semi-structured and questions open-ended so that responses are not restricted. There is also generally no preset sequence to questions, and the questions are asked in the order in which the discussion unfolds. Semi-structured interviews could be held with an individual at the household-level or carried out with a group. At the household level semi-structured interviews can provide in-depth information of a sensitive nature (such as on substance abuse). At the community level, semi-structured interviews used in focus group discussions (FGDs) can generate background information on various issues in relation to particular resource use patterns (such as near-shore coastal fishing or coral mining) or particular events such as the Asian Tsunami. Visual-based techniques are also an integral component of participatory approaches. For example participatory census mapping and resource mapping exercises are popular methods used to facilitate the commencement of a discussion among a community group and are also an important method of obtaining information regarding

the social structure within a community and the natural resource base they are dependent on. Ranking and scoring exercises - two other popular tools undertaken either by individuals or groups can help reveal the priority problems and preferences of a particular community group (for example the needs of fishers using traditional canoes would differ from those using larger, outboard engine fiberglass boats). In wealth ranking exercises the local indicators of poverty are obtained and the stratification of the community by relative wealth undertaken. Other diagrams drawn by community members address the historical and seasonal trends of local livelihoods. For example in my study site, coastal fishers presented seasonal calendars which showed the main fish species found at different times of the year. Overall, visual-based techniques are considered important tools for empowering local communities and for enhancing shared understanding between outside researchers and local people (Chambers, 1985; Chambers, 1992; IIRR, 1998).

While the credibility of participatory methods used in the appropriate context, is being increasingly accepted in most fields of applied social research (Scoones, 1998), these techniques are not intended to replace good quality survey work. Indeed, participatory methods should be seen as part of a larger set of research methods each with its own strengths and weaknesses as they are often used in conjunction with more conventional methods (IIRR, 1998). For instance participatory techniques are useful in giving direction and focus to a subsequent questionnaire based survey. In turn, a survey can verify and qualify the qualitative findings obtained from a participatory exercise. In some situations participatory methods properly conducted, may be sufficient by itself to provide the necessary answers and insights (Reitbergen-McCraken and Narayan, 1998). Another important characteristic of participatory methods is that they are usually less time consuming than a full-fledged questionnaire based statistical survey and while these methods do not collect detailed statistics, a good qualitative and representative picture of the situation can be obtained (Townsley, 1998). Data from participatory research cannot however usually be subjected to rigorous statistical analysis. So to test its validity and reliability, other alternate criteria must be utilized, such as cross-checking with different sources and triangulation of results using different methods (Pretty *et al.,* 1995).

There are other more critical limitations in participatory methods in terms of the way these tools are applied and by whom. For example if these participatory tools are adopted in isolation and without putting into context the background of the community under

investigation, often these methods will only reveal a "quick and dirty" overview of a particular topic which would not only be superficial in it's interpretation and only give a partial picture, but may also be inaccurate. Moreover if these tools are used by individuals who either do not have proper training or practical experience in how to use these, the results can be very misleading.

Often development consultants or researchers are working on tight time frames and have only limited time to spend in the field on data collection and thus use PRA tools in their worst form. This could lead to the over-simplification of complex socio-economic issues linked to natural resource management and poverty at the site, which could in turn result in inappropriate development and management decisions being made - based on these findings. For example, it is difficult to identify the poor even in circumstances where long-term research has been undertaken, and therefore in the case of a rapid participatory appraisal, this problem could be further exacerbated. Ironically it is often these short-term consultancies or research outputs that inform development interventions, especially those that are donor driven (Stirrat, 1996; Foell *et al.,* 2000; Mosse, 2003).

More obvious weaknesses of certain participatory methods include the over-simplification of social groups to participate in exercises such as FGDs and rankings (Stirrat, 1996). For example, broadly dividing communities into resource user groups (fishers and farmers) or gender (men and women), without taking into consideration that there would be several subdivisions within these broader groups. For instance, the 'fisher' category may need to be subdivided based on fishing vessel used (traditional canoe, fiberglass boat or multiday boat) or being a boat owner or working as hired help in the fishing industry, as opinions and views expressed will depend largely on the background of each individual.

I have summarised the overall strengths and limitations of both the participatory and more conventional methods that I use in my study and this is given in Table 3.3 (for wealth rankings and in-depth interviews see Table 5. 11).

Table 3.3. Overall strengths and limitations of data collection methods used in my study

Method	Strengths	Limitations
Focus Group Discussions (FGDs)	• Relatively quick method of getting an overview of a particular topic (for example resource use patterns such as lagoon fishing) or an event (for example the Asian Tsunami). • A useful way to obtain the views of a particular group within the community (for example coral miners or sea fishers that use traditional canoes)	• May hide diversity of opinions and present a falsely homogenous view on a subject instead (individuals who are poorer or of a lower status in the group my not be able to articulate their opinion as well as more powerful/wealthy individuals). • May give only a "quick and dirty" overview of certain subjects. • Some participants may not feel comfortable discussing sensitive issues in a group.
Mapping exercises	• Represents a good way of initiating a focus group discussion. • Resource mapping provides a good visual representation of resources and where they are located (for example maps of lagoon). • Village maps are useful for obtaining a visual representation of how my household sample is spatially located. • Maps of the tsunami impact are useful to show how the topography of the land resulted in households being impacted in a particular manner.	• Relies on the ability of participants to visualize spatially the location of resources or households in the village. • In terms of natural resource uses, some participants may not want to reveal certain information to outsiders (for example the location of particular fishing grounds).
Ranking exercises	• Allows each of the participants to express their opinion in terms of what their problems and preferences are (for example in relation to resource degradation or development required in the area). Therefore dominant personalities cannot control the outcome. • Helps the participants prioritise issues affecting them (for example priority actions required to rehabilitate the fisheries post-tsunami).	• Consensus building on the outcome may be time consuming. • Ranking exercises taken out of context could be meaningless (for example ranking of problems associated with fishing would be different depending on the background/type of fishing group undertaking the ranking exercise – i.e., problems for boat owners may differ from those who are hired help,

Method	Strengths	Limitations
	• Can be analysed quantitatively.	although they are engaged in fishing together).
Seasonal calendar for fishing	• Possible to get an overview of which species were predominantly caught in which months and which months there were a high and low catch.	• Relies on the participants accurately recalling details of catch over the year.
Household surveys	• Can be analysed using statistical methods (for example food security data). • Provides the opportunity to compare households in relative terms to each other. • If similar data is collected repeatedly over time from the same households (panel data), then it can help record changes within a household over time.	• More time consuming than collecting data using participatory methods. • The data lacks the richness and depth obtained from qualitative methods.

3.4 Data collection and logistics

The field data collection for my study involved carrying out socioeconomic assessments using a combination of certain participatory methods and more conventional surveys and in-depth interviews. Therefore both qualitative and quantitative data collection tools were utilised.

All methods were piloted before being used for data collection proper. I had some training in these techniques prior to using them. I also learnt from trial and error in the field, and the piloting of methods was important in this context as they could be improved upon during the course of the research and their limitations minimized. I facilitated all the FGDs and wealth ranking exercises conducted in the field. With respect to the household surveys, when data collection was taking place simultaneously in both Rekawa and Kalametiya I tried to divide my time between the two sites. However, since I was not present in each site all the time, I checked up on all data collected on a regular basis. Usually on one day of the week I held a meeting with the field assistants and discussed all the questionnaires they had administered that week and double checked on any responses which were not clear. Queries could be easily cleared up in this manner (if over a longer time period it would be unlikely that the field team would recall what certain responses

meant). For each site, the field assistants filled out time sheets where they indicated households visited each day, name of respondents interviewed (male/female) – date and time and who administered the questionnaire. This was useful to monitor overall progress on data collection.

I divided the data collection into three phases. Phase 1 took place over a four month period from January to April 2002; Phase 2 was carried out during July 2002 to October 2003 and Phase 3 took place from February to March 2005. Fieldwork was conducted in *Sinhala*, the national language in Sri Lanka the communities in the study area are fluent in.

Under Phase 1, first a reconnaissance survey was conducted in the study site to provide initial information that would help plan out the field data collection phase. The reconnaissance survey involved visiting each of the study areas – Rekawa and Kalametiya over a period of a few days and through rapid appraisal techniques collecting preliminary data from different stakeholder groups. Special attention was given to the lagoon and sea fisheries sector as these were the most prominent natural resource dependent livelihood activities in the study area. Several informal focus group discussions (FGDs) were also held to obtain background information on the different resource use issues in the area and this information was used to select the specific villages within the study site that were suitable to involve in the research. Preliminary data collection commenced thereafter and continued until April 2002. This included mapping of villages, wealth ranking exercises, semi-structured interviews, FGDs and household questionnaire surveys that covered the livelihood and food security aspects, in addition to the SAM process. Institutional interviews were also carried out at the local and central government level during this time period.

A majority of the data collection for my study was undertaken in Phase 2. Data on personal well-being in addition to further data on food security, livelihood security, natural resource uses and involvement in the SAM process was collected during this Phase of field work. To obtain a gender perspective, questionnaires were administered to both a male and female in each household. In-depth interviews were also conducted with a smaller sub-sample on poverty related issues. Phase 3 constituted of a two-month assessment undertaken at the study site after the Asian Tsunami and included FGDs,

mapping exercises and a household survey. A summary of the data collection schedule for Phase 1, 2 and 3 is given in Annex 3.1.

3.4.1 Selection of villages in study site

Three villages were selected from each lagoon area for my study, i.e., a total of 6 villages. The total number of villages adjacent to the Kalametiya lagoon is eight and adjacent to the Rekawa lagoon is also eight. A stratified random approach was used in the selection of the villages based on the following criteria: the total number of households in the village (a manageable number from which a sub-sample could be used for undertaking household surveys); geographical location in relation to the lagoon and the coast (one village nearer the sea; one village on the land-side of lagoon and the third situated between the sea and the land side of the lagoon) as this would result in different levels of access to different types of natural resources (for example lagoon fishery or sea fishery); and the range of livelihood activities undertaken within a village. These activities included a number of natural resource uses such as lagoon and sea fishing, fish trading, coral mining, operating lime kilns, shell mining, turtle egg-collecting, farming (paddy, chena slash and burn and home gardening), buffalo farming, coconut cultivation and coir rope making. Special attention was paid to ensure that the total population engaged in fishing varied between the villages. The main sources of information that helped in the selection of villages were FGDs and meetings with the local Grama Niladari Officers and local government officials (for example the Divisional Secretariats from Tangalle and Ambalantota). Secondary sources of data on the area were also crucial in the selection of villages.

3.4.2 Mapping of villages

Each of the 6 villages under investigation was mapped with the assistance of the community researchers. The maps produced included roads, water bodies, agricultural lands, major landmarks in the village (for example the village school, temple and fisheries corporative building) and all the households. Each house was given a number. Corresponding to the household number, the family name of the household was listed (the local electoral role was obtained to use for guidance) and the primary livelihood activity noted. By mapping the villages ourselves, we could confirm the electoral role and also

make a note of households that had emigrated out of the area as well as check for new families that had recently immigrated into the villages.

3.4.3 Selection of household sample

To ensure that I had an adequate number of data points to carry out my study to an appropriate statistical power, I collected data at the household level. I selected 35 households in each of the 6 villages (my sample thereby comprised of 210 households). I obtained a representative sample from each village – based on primary livelihood activity and wealth rank of each household, by using a stratified random approach. These two criteria were considered important in the context of my PhD, as I was attempting to test the usefulness of certain indices I developed to measure some aspects of poverty in a rural coastal setting, focusing on natural resource based livelihoods. The percentage of households engaged in the different primary livelihood activities in the village as a whole was calculated and the same done in terms of the percentage belonging to each wealth group. A proportionate number of households were selected randomly from each of the livelihood categories and wealth ranks to make up the 35 household sample.

The total number of households in the 6 villages under investigation was about 554 at the on-set of the research. Therefore a total of about 38% of the households in the villages under investigation were sampled (this covered a total of between about 28% and 58% of the households in the villages). I found that a sample of 35 households per village enabled me to go into adequate depth in regard to the research objectives I was trying to address, and also, proved to be a manageable number of households to collect accurate information from taking into consideration the time availability and the logistical aspects of my research.

3.4.4 Poverty dynamics

Wealth ranking exercises were initially undertaken in January and February 2002 involving all households in the six villages under investigation, with the objective of obtaining a stratification of households in each of the six villages in terms of wealth (these findings were used in the selection of my household sample). In each village three wealth rankings were undertaken with at least three groups (male, female and a mixed

group). These preliminary wealth ranking exercises proved to be useful in identifying the poorest and most vulnerable households and these results were validated during subsequent household surveys. A detailed review of the wealth ranking methodology is given in Chapter 5, Section 5.3.1. The first round of wealth rankings were undertaken in collaboration with the SEI PRP study (see Section 3.5 in this chapter). In August and October 2003 historical wealth ranking exercises were also undertaken in Rekawa and Kalametiya in order to obtain an understanding of the overall upward or downward mobility of the households in terms of poverty over the last 10 years, thereby obtaining a preliminary indication of the dynamics of poverty in the study site. I conducted in-depth interviews at the household-level in October 2003 under the CBMS study (see Section 3.5) to gain a better insight into the causal and relational aspects of poverty and help determine which factors enhance or impede mobility in terms of poverty. A semi-structured, open-ended questionnaire was developed for the purpose.

3.4.5 Livelihood security

A household livelihood questionnaire was designed to gather information on natural resource use patterns, livelihood activities and the socioeconomic status of the sampled households. The questionnaire was administered under Phase 1 in February and March 2002 to the household sample (to both male and female respondents in each household). The survey included questions about both past and current livelihoods, to facilitate assessment of the factors affecting sustainability of livelihood security. See Annex 3.2 for Livelihoods questionnaire. Some shortcomings in the questionnaire became apparent during data collection, and these were addressed in Phase 2, through a questionnaire on natural resource uses (see Section 3.4.8) and a survey on asset ownership at the household level (see Annex 3.3).

3.4.6 Food security

With regard to food security, data was collected under Phase 1 and 2. Phase 1 included preliminary interviews, five FGDs and developing and piloting a questionnaire. Phase 2 included finalizing the food security questionnaire by undertaking a further nine FGDs, and thereafter carrying out 3 rounds of household surveys (to capture seasonal variations) that took place between September 2002 and July 2003. Each survey round lasted two

months and questionnaires were administered to both a male and female in each of the 210 households. Only the first survey included questions on the long-term strategies adopted, while all three surveys included questions on the short-term strategies. A detailed discussion of the methodology employed is given in Chapter 6, Section 6.3. See Annex 3.4 for the food security questionnaire.

3.4.7 Personal well-being

Data collection commenced in September 2002 on the personal well-being aspect of the study. First a semi-structured questionnaire was developed and piloted with both male and female respondents in Rekawa and Kalametiya. Thereafter the personal well-being questionnaire was finalized and administered to my household sample during January and February 2003. A detailed description of the methodology is given in Chapter 7 Section 7.3. See Annex 3.5 for the personal security questionnaire.

3.4.8 Patterns of natural resource use

To obtain background information on the various natural resource uses the communities are engaged in I conducted semi-structured interviews in June – July 2003 with my 210 household sample (one questionnaire per household). A separate questionnaire was also administered to those engaged in fishing and fish trading. From these interviews I gathered some basic information on numbers engaged in each activity at the village-level, each households' level of dependence on the activity and perceived importance of the activity (in terms of proportion of income derived).

In relation to fisheries related activities, prior to the household questionnaire, I also carried out eight FGDs with lagoon fishers and sea fishers that use traditional canoes, 19.5 foot fiberglass boats and engaged in the beach seine fishery, to obtain a broad overview of the fisheries in the study site. The main issues covered in these discussions were the different fisheries resource use patterns adopted in the study area and their importance in respect to livelihoods. A general overview of the local institutional structures such as fisheries cooperative societies that governed access to near-shore and lagoon fish resources was also obtained. In addition, during the discussions information was also gathered on alternative livelihood generating activities, conflicts between the

different resource use groups, and between user-groups and authorities. A semi-structured interview technique was adopted during these preliminary FGDs. In addition, FGDs were also held with groups engaged in other resource use activities such as coral mining and lime kiln operating and shell mining.

3.4.9 The Impact of the Special Area Management (SAM) process

Under Phase 1, interviews were held with government officials from the local and national level to understand the CZM policy and SAM process from inception, through interpretation and on to implementation, and the institutional and policy mechanisms operating in the sites. To determine how the SAM process has impacted livelihoods at the household level a questionnaire survey was administered under both Phase 1 and 2 (one questionnaire per household). The household's perception of SAM and their involvement, how they feel they have either benefited (or not) from the process and the reasons for this were included. In addition, alternative income generating activities (if any) they were involved in through SAM were recorded. See Annex 3.6 for the SAM questionnaire.

3.4.10 Impact of the Asian tsunami

To evaluate the impact of the tsunami on livelihoods of the communities in my study site, a relatively short assessment was undertaken from February to March 2005. Data collection methods included FGDs and a household survey as well as mapping exercises. Ten FGDs were undertaken with the different fisher groups and women in the site. A combination of semi-structured questions, ranking exercises and visualisation techniques were used during the FGDs. The post-tsunami household survey revisited the same 210 households as in Phase 1 and 2. The fact that baseline data were available allowed me 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 were also solicited. In addition the survey included questions on what coping strategies were used by the household immediately after the tsunami and how their sense of personal well-being and security was affected. (See Annex 3.7 for the post-tsunami questionnaire). Chapter 8 Section 8.4 gives a more detailed outline of the methodology.

Figure 3.1 Overview of the variables measured and the data collected for my study
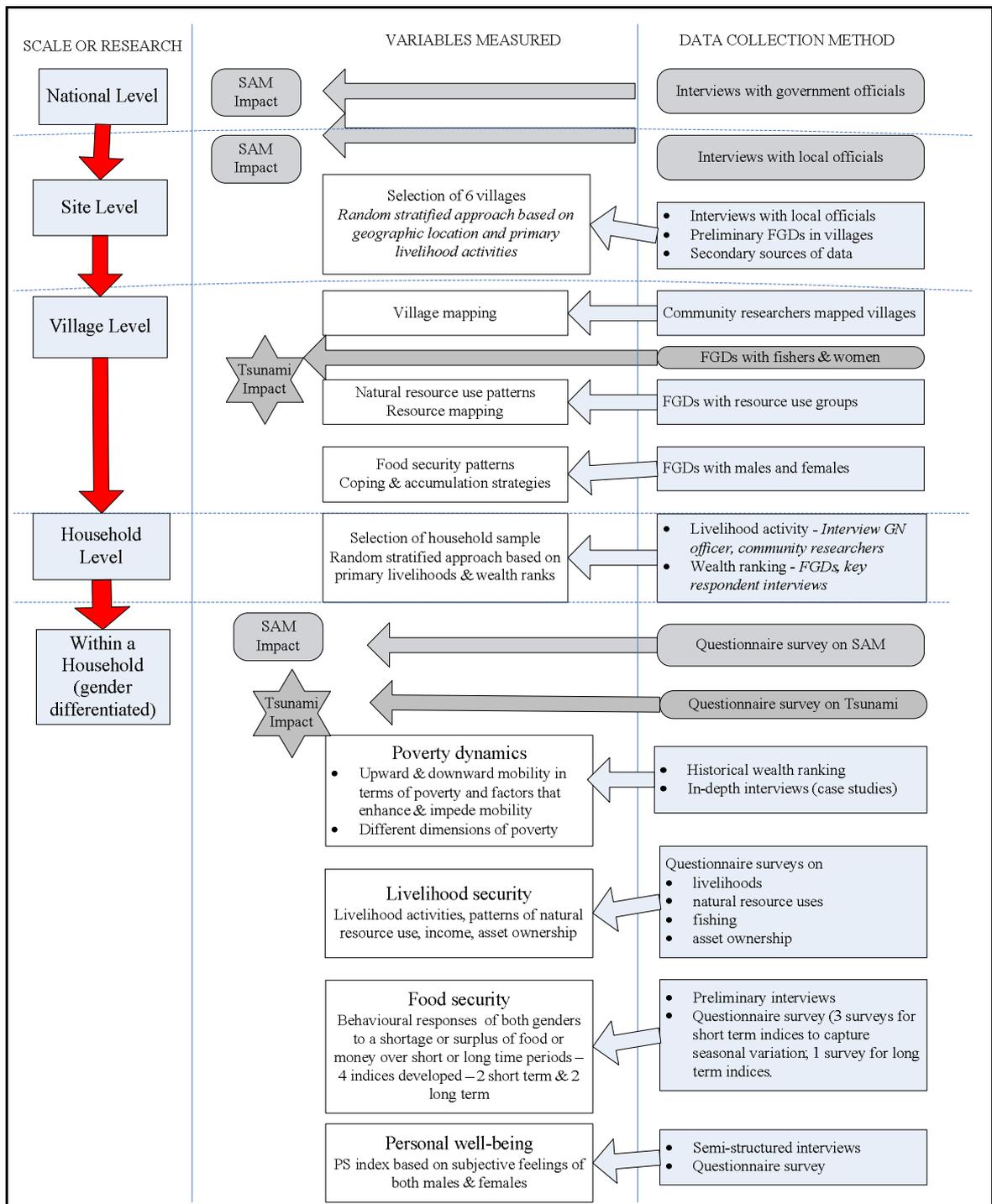
3.5 Collaborations and consultancies

While undertaking my PhD, I had the opportunity to collaborate with several research institutions and also engage in some short-term consultancies (see Table 3.4) that were complementary to my research interests. I was careful to ensure that this additional work did not interfere with my PhD fieldwork schedule (see Annex 3.1)

From January – June 2002 I collaborated with the Stockholm Environmental Institute (SEI) in York, UK on the project "Improving Policy-Livelihood Relationships in South Asia" which was funded by the UK Department for International Development (DFID) under its Policy Research Programme. The project which was undertaken across South Asia included assessing coastal resource management policies in Sri Lanka. The objective of the research was to provide practical policy options to improve the livelihoods of poor people and reduce vulnerability, by improving understanding of the impact of policies on livelihoods and how local people can engage with the policy process. In Sri Lanka research was undertaken in Rekawa, Kalametiya and Malala. As I worked closely with the SEI research team in early 2002, I structured Phase 1 of my fieldwork to coincide with their data collection phase. I worked with them to develop a common livelihoods security questionnaire, which included my food security questionnaire. A common questionnaire on policy process such as Special Area Management was also developed. Field work in Rekawa and Kalametiya and institutional interviews at the central government level were conducted as a collaborative effort.

In September - December 2002 I collaborated with Integrated Marine Management (IMM) UK, to produce a report highlighting good practice when carrying out livelihoods research with rural communities, especially more vulnerable groups. This was in relation to the IMM Sustainable Livelihoods Research Participation Framework and investigated how community members could play a bigger role in research activities and also how research could have a more practical relevance to these communities. These principles are reflected in Section 3.6 of this chapter regarding the community research team. In addition, the distribution of my preliminary results and recommendations to the community (discussed in Section 3.8) was carried out as a result of community recommendations made in the IMM report.

In September – December 2002 I also undertook an assignment as Research Assistant to the Editor for the Coastal Zone Management Plan (CZMP) 2004 Update for Sri Lanka (under the CRM Project). During this time, I had the opportunity to contribute to the Special Area Management Chapter in the CZMP, and some of my preliminary research findings have been incorporated in this national policy document (see CZMP 2004, Chapter 6 on Special Area Management).

In March 2003 I collaborated with SEI on research undertaken in Kalametiya for a study assessing the capability of linking the Sustainable Livelihoods Framework and the WEAP (Water Evaluation and Planning) model and to determine how rural households' use and value water in their livelihood strategies. FGDs with lagoon fishers and farmers with respect to management of water resources were conducted in collaboration. Some analyses presented in my PhD were undertaken jointly with researchers at the SEI; these include data collected during these FGDs and data from Phase 1 of my study (with the exception of the food security data, which I worked on independently). These joint analyses are presented in Chapter 4 and referenced accordingly in the text.

In September – December 2003, I was involved in the Community Based Poverty Monitoring System (CBMS) Project in Sri Lanka. The CBMS study focused on the dynamics and causes of poverty and involved identifying and pilot testing indicators for a community based poverty monitoring system in selected locations in Sri Lanka, including Kalametiya. The study, which was part of a larger PEP (Policy and Economic Policy) Research Network international CBMS project, was commissioned by the Institute of Policy Studies (IPS) Sri Lanka and was coordinated and guided by IMCAP (Improving Capacities for Poverty and Social Policy Research) at the University of Colombo. As an IMCAP Associate, my research involved developing and pilot testing a qualitative methodology to identify factors and processes that underlie poverty dynamics, using Kalametiya as my empirical case study. Findings from the CBMS study are presented in Chapter 5 Section 5.4.4.3. The study also highlighted the important role community members can play alongside researchers in data collection and methodology development.

In May/June 2004, I was contracted by the Asian Development Bank and the Royal Netherlands Embassy, Sri Lanka, to review the Coastal Environment and Resource Management (CERM) Component of the Coastal Resource Management Project (TA 3477-SRI) which is being currently implemented in Sri Lanka. CERM addresses problems of coastal resource degradation and includes activities intended to alleviate poverty levels of coastal communities, thereby relieving the pressure on coastal resources. My assignment involved undertaking a comprehensive assessment of the CERM component to review the outputs and current progress of interventions and to make

recommendations based on the findings. This included assessing activities at the local level at the 6 SAM sites, including Kalametiya. This provided me with an overview of the SAM process at the national policy-level. Findings and recommendations from my assignment are incorporated in Chapter 4 Section 4.6.

Table 3.4 Collaborative research and short-term consultancies undertaken during PhD

Research/Consultancy	Time period covered	Number of days spent
Improving policy-livelihood relationships in South Asia (SEI, UK).	January – June 2002	125
Sustainable coastal livelihoods project, South Asia. Community participation in research (IMM, UK)	September – December 2002	12
Coastal Zone Management Plan revision (CRMP, Sri Lanka)	September – December 2002	10
Linking the sustainable livelihoods framework and the WEAP model (SEI, UK)	March 2003	14
CBMS study in Sri Lanka (IPS, Sri Lanka)	September – December 2003	35
Midterm review of CERM component of CRMP (ADB/Royal Netherlands Embassy)	May-June 2004	20

While the above mentioned collaborations and consultancies presented me with the opportunity to conduct research in my study site, the analyses undertaken for my thesis were my own independent work (with the exception of some of the descriptive analysis undertaken jointly with SEI and presented in Chapter 4).

3.6 Field research team

A fairly large team was involved in data collection Phase 1, as I was collaborating closely with the SEI PRP research project during this period. A team from a Sri Lankan university (Ruhuna University) was hired by SEI, together with local community members from Rekawa and Kalametiya, who acted as field research assistants. Under Phase 1 of my study therefore I did not work alone, but obtained assistance in data collection from SEI, Ruhuna University and the local community members. Before we commenced the field work, the research team was given some training on the field methodologies we were adopting and also on general field protocol. To gather background information on the lagoon and coastal fisheries, I hired a biologist familiar with the taxonomy of aquatic species to help classify the different species observed at the fish landing sites and local markets. Local institutional interviews were carried out in collaboration with Ruhuna University, while the institutional interviews in Colombo were undertaken by me, together with the team leader from Ruhuna.

During data collection Phase 2, which I undertook on my own, I decided to employ the same community members since I had built up a good rapport with the local team. While I had worked in the study area prior to my PhD research, I had only some limited direct interaction with my sample population during that period. It was however of critical importance that I had a good link to the local community during my PhD study and the local research assistants provided this for me. The community research team represented different age groups, both genders and a diverse set of experiences and ideas (see Table 3.5). Recognising the fact however that there may be biases introduced by using residents of the villages as field assistants, I ensured that they did not collect data from their own village or at least that team members from other villages worked together with these individuals so that the data gathered remained objective.

Table 3.5 Background of community research assistants

Gender	Age (in 2005)	Village	Education level	Data collection phase involved in
Male	33	Wewegoda, South Batatha	Secondary	Phase 1, 2 and 3
Male	34	Gurupokuna	Secondary	Phase 1 and 2
Female	44	Gurupokuna	Secondary	Phase 1, 2 and 3
Female	25	Tuduwa	Secondary	Phase 2 and 3
Female	25	Rekawa	Secondary	Phase 1 and 2
Female	30	Wellodaya	Secondary	Phase 1, 2 and 3
Female	30	Godigamuwa (GN: Marakolliya)	Tertiary (currently registered for an external degree in sociology at Ruhuna)	Phase 3

One common characteristic that the local team members all shared was that they had been involved in research activities that had taken place in these areas previously and therefore had some knowledge on participatory research methodologies, which proved to be very useful. Training sessions were done with the team prior to commencement of the different parts of the fieldwork and the pilot surveys used as trial sessions to practice their data collection skills. I made an active effort to ensure all the team members expressed their own views on data collection issues and discussed matters openly – to make the data collection a collaborative effort between the team and myself. It was important that the team felt a sense of commitment to the research not merely because they were being remunerated to collect data but because they felt a sense of 'ownership' in the process. In this light, the team made some valuable contributions during the pilot testing of methods and showed genuine enthusiasm in undertaking the fieldwork. Moreover, the research assistants expressed that they would like the research results and outcomes of the research project made available to them. As members of the local community themselves, they felt that this could make a valuable contribution to various aspects of life in the villages.

This was clearly illustrated during Phase 3 of my fieldwork - the post-tsunami rapid assessment I carried out in the study site where I obtained the services of the same research assistants from Rekawa and Kalametiya (a new female community member from Rekawa was hired however to replace an assistant who had left the area). These community members played a vital role in data collection and methodology development

and were keen to be involved in this assessment although these were very difficult times for them personally as some of them had been directly impacted by the Tsunami. The research proved to be one way for them to get involved in post-tsunami rehabilitation[10] work.

3.7 Limitations encountered in data collection

During Phase 1 of the field work some problems were encountered among the field research team members mainly as a result of some of the graduates feeling they were more "knowledgeable" than the local community members, which was actually not the case especially when it came to local issues. This made their working relationship somewhat strained. Matters were however resolved in the end by holding a meeting and encouraging team members to discuss their problems openly and resolve any differences of opinion amicably.

Another important factor that emerged during the first phase of fieldwork was that 'primary livelihoods' had different meanings to different members of the community and it was important that this was explained carefully. It was only towards the end of Phase 1 that I noted that sometimes households would indicate their primary livelihood based on their caste and not on what they were currently engaged in (for example 'fisher' caste but actually engaged in casual labour now due to low shrimp catch). This factor was followed up on very carefully in subsequent data collection under Phase 2 and the caste of the respondents (both male and female) was recorded. A majority of the respondents were also uncomfortable divulging information on income, as they were anxious that by revealing this information it may prevent households receiving benefits from government subsidy and welfare schemes. To overcome this problem, under Phase 2, all livelihood activities engaged in presently were listed, and then the proportion of income derived from each activity from the household's overall income was noted by giving respondents 10 stones and been requesting them to indicate income proportions using these. The respondents felt comfortable discussing their income in this manner.

---

[10] Data gathered from the FGDs were used by local non-governmental organizations (NGOs) and projects operating in the area to support the recovery of fisheries livelihoods in the Kalametiya area following the tsunami disaster.

A majority of the household surveys were conducted under Phase 2, and it was sometimes difficult to maintain the attention of the respondent if it took over an hour to administer the questionnaire. Therefore when questionnaires were piloted I tried to ensure that the final questionnaires were made as concise as possible.

During Phase 3, while a vast majority of the households in my sample willingly participated in the post-tsunami household survey and gave their utmost corporation, there were a few households that refused as they were not receiving any direct benefit from doing so. These households were not thereafter forced to participate. In contrast, some households that were not part of my original household sample were upset that details of their asset loss etc., was not being recorded by my study as they felt they may "lose out" on obtaining some post-tsunami aid. When their feelings were conveyed to the field team, the overall aims and objectives of my PhD research needed to be explained to these individuals who were not part of my sample and also the fact that individual households in my sample would not directly obtain tsunami aid just by participating in this post-tsunami assessment. One reason for this confusion was also due to a number of development agencies descending on the area post-tsunami and distributing aid in a completely uncoordinated manner. There were other agencies collating data on destroyed livelihood assets and property and the community members were confused by the presence of all these different groups.

3.8 Ethical considerations in relation to my research

There were several ethical considerations I took into account during my data collection. To ensure that false expectations were not raised amongst community members regarding what the research would "do" for the communities in respect to providing direct aid or assistance to households in the study site, the academic objectives and purpose of the research was clearly explained to the community each time before data collection commenced. Likewise, the community was also made aware that the research would not in any way prevent households in the area from receiving aid or assistance from other sources or stop households receiving benefits from any government subsidy schemes. Information obtained from individual households was treated as confidential and only used for academic purposes and this was explained clearly to the community. When preliminary findings from my study were passed on to the policy level, I ensured that individual sources of information were kept anonymous. By making those at the policy-level aware of my findings I hoped that there would be some long-term benefits to the people of the area.

While I was aware of the methodological problems associated with participatory rapid appraisal methods that often undertake "quick and dirty" research reviews, in my own PhD research I made a conscious effort to limit as far as possible these problems, by using these methods in conjunction with more conventional data collection methods (for example, surveys and in-depth interviews) and also spending as much time as possible in my study site, to ensure that the participatory methods were used in the appropriate context and in a more informed manner.

To build up a good rapport with the community, I lived in my study site when conducting the field work. In early 2002 my family acquired a small house in one of the villages that was part of my study site and we were based here during the different phases of field work. This gave me the time I needed to get to know the community better in a more informal setting, and outside the times set aside to undertake the different data collection exercises. In general I made an effort to put people at ease by always being respectful of their knowledge and sensitive to local dress codes, traditions and religious observances. During data collection, I strived to make these exercises the least disruptive as possible to people's daily routines by arranging meetings or visiting households at times convenient

to them, not to myself, and trying as far as possible not to take people away from their livelihood activities. While there are two schools of thought on whether community members should receive some financial or materialistic benefits for participating in research, I was of the opinion that in the case of my PhD study it was not necessary or appropriate to give a direct financial payment to those involved in the FGDs and household surveys. No individual was forced to participate in my study, and once the aims and objectives of the PhD were explained it was only if they showed willingness to volunteer their time did their involvement continue. As in most instances elsewhere in Sri Lanka, in the case of my PhD many indicated that they were interested in participating as a result of this being an educational exercise.

While my involvement with the Coastal Zone Management Plan updating process and the CERM Midterm Review gave me the ideal opportunity to ensure that my preliminary research results reached the policy level, I also ensured that my findings fed back to the communities in my study site so that they felt that they had played a proactive role in the research, rather than just being subjects that information was extracted from. In this context, I designed and published a short document in *Sinhala* that gave a brief overview of my preliminary results and recommendations. This document was distributed among the community – specifically to my sample of 210 households and all those who participated in the FGDs.

During the post-tsunami assessment I took up as little time as possible of the people as these were very hard times for them. I also ensured that participating communities benefited from this research at least in the medium and long-term, by using the findings of my study to develop suitable strategies to assist the villages that formed my sample through local non-governmental organizations.

3.9 Data analysis

3.9.1 Units of Analysis

3.9.1.1 Community

In terms of conservation and natural resource management often the term "community" has been viewed as a small spatial unit, as a homogeneous social structure and as having shared norms and rules to manage resources (Agrawal and Gibson, 1999). In reality however rural communities are far more complex social structures that are usually heterogeneous with regard to levels of poverty and wealth and levels of access to different natural resources; and generally engaged in varied combinations of livelihood activities. Communities have also been shown to be dynamic and internally differentiated in terms of age, gender, ethnicity, caste, religion and political affiliations – all factors that influence their utilization of natural resources (Leach *et al.,* 1999; Agrawal and Gibson, 1999; Allison and Ellis, 2001). In the context of my study therefore when the term "community" is used, it denotes a complex, heterogeneous group of individuals who are living in the different villages in the two sites Rekawa and Kalametiya that form part of my sample. The heterogeneous and dynamic nature of the community under investigation is described in more detail in Chapter 4 under Section 4.4.2 and Section 4.5.

3.9.1.2 Household

The household is an accessible and recognizable research unit that is used in the analysis of a variety of socioeconomic indicators by many governments, research institutes and development agencies. In my study the household was selected as the unit of analysis to investigate the communities' different poverty levels (wealth ranks), patterns of natural resource use and livelihood security (including asset ownership). In addition, the impact of the SAM policy and the 2004 tsunami were also investigated at the household level.

The household is considered to be the level at which resources are pooled and decisions are taken collectively about consumption, production and investment (Corbett, 1988). In my study a household was defined by the number of people who live under the same roof and regularly eat their meals together. In Sri Lanka a household usually comprises of a nuclear family (Department of Census and Statistics, 2002b).

It is important to note that as in the case of the community, a household is dynamic and heterogeneous in nature (Maxwell and Frankenberger, 1992). The composition of a household varies with time – for example, the size of the household usually increases (with children) and then decreases (with the marriage of children, migration or death of family members). Households are also heterogeneous in terms of gender and age, which influence decision making, division of work and access to resources at the intra-household level. Taking this into consideration, in my food security and personal well-being analyses, gender and age were included as two variables. In addition, the intra-household in-depth interviews also clearly revealed differences in the views of individuals on various issues based on their gender and age.

3.9.2 Methods of Analysis

I broadly used three methods of data analysis. This included both the analysis of qualitative and quantitative data. First, I undertook a simple descriptive qualitative exploration of the data that enabled me to draw out major trends and influences on the household livelihoods and food security as well as personal well-being.

Secondly I carried out some simple univariate analyses. Non-parametric tests such as Spearman's correlation tests were undertaken to determine the relationship between a household's wealth rank and some conventional poverty indicators such as income, being a recipient of government welfare programmes, type of housing, source of electricity and water and asset ownership (household and productive). Univariate tests were also undertaken to investigate the differences in scores of the food security and personal security indices, within households in the same village and between villages and between sites; between the different types of fishers and between fishers and those engaged in other livelihood activities; and between female and male respondents. In this context, Spearman's correlations were used to evaluate the relationships between food security indices and geographic variables, demographic variables, livelihood activity related variables and CMZ policy related variables. Logistic regressions were undertaken to determine the relationship between the personal well-being index and other well-being related predictor variables such as wealth rank and the food security indices as well as more conventional predictors such as income and welfare. In addition the relationship

between demographic, geographic, livelihood and policy related variables and personal well-being were also tested.

Finally, I undertook multivariate regression analyses. With respect to the food security indices which showed near-normal distributions, generalised linear models (GLMs) were run to relate the dependent variable, i.e., the food security indices, to a number of explanatory variables that showed a significant uni-variate relationship. For the personal security index, which was ordinal and dichotomous, binary logistic regressions were undertaken. The multivariate regressions helped me predict the influence of the explanatory variables on the dependent variable by giving the significances and coefficients for the individual variables taking the others into account. The results of the multivariate models for food security and personal security were compared and conclusions drawn.

While this chapter described the different data collection methods that were adopted in my study site, the next chapter gives a synopsis of the actually site itself in terms of the communities and the main natural resource systems my research focused on.