3 RESEARCH METHODOLOGY

This section outlines the place and time of the research, where and how the data was collected and how the data was analysed.

3.1 Overview of Proposed Research

The research was based on three objectives (Figure 3.1). Objectives 1 and 2 followed a similar pattern of a preliminary research design and preparation stage leading into field interviews. Objective 3 was predominantly desk based with supporting information from key informant interviews. The results from the completion of these objectives were analysed and disseminated locally through discussions with staff and more widely through scientific publications. There is a narrowing of focus from a broad provincial review in objective 1, to a deeper analysis of the livelihood strategies of selected coastal communities (objective 2) before a precise evaluation of how well projects were targeted for the needs of the community (objective 3). The selection of coastal communities for deeper analysis was based on the criteria of fisheries dependence and household poverty. Cluster analysis was used to segregate the fishing dependent coastal Kelurahans and a representative Kelurahan was chosen from each cluster for the sustainable livelihoods analysis of objective 2.

To aid the reader the specific methodology used for each section is detailed in chapters 4-7. This current section provides a brief methodological summary.
Figure 3.1: Research framework. The pattern of research is similar for each objective. After a preliminary preparation and collection of secondary data stage (red boxes), primary data will be collected (orange) and analysed (green) with results being disseminated (blue).
3.2 Location and Place of Research

After initial secondary data collection, field research was undertaken during two time periods as indicated in Table 3.1.

Table 3.1: Location and time of proposed research. For objective 2, the selection of coastal communities were based on the results from objective 1.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Data collection (time)</th>
<th>Data collection (location)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Provincial review</td>
<td>Secondary data: April – June 2011</td>
<td>Offices of regional statistics office (BPS), BAPPEDA, DKP</td>
</tr>
<tr>
<td></td>
<td>Primary data: June 2011: Interviews with staff</td>
<td>Provincial and Kabupaten offices of DKP and BAPPEDA</td>
</tr>
<tr>
<td></td>
<td>September -October 2012: Field interviews with key informants</td>
<td>25 selected coastal Kelurahans based on results of fishing dependency analysis.</td>
</tr>
<tr>
<td>2 - Sustainable livelihoods Analysis</td>
<td>Primary data: September-December 2013: Field interviews and focus groups</td>
<td>Sungai Pinang and Carocok, Tarusan</td>
</tr>
<tr>
<td>3 - Evaluation of projects</td>
<td>January – March 2013: Field interviews and focus groups</td>
<td>Selected coastal communities in Agam, Padang and Pesisir Selatan.</td>
</tr>
</tbody>
</table>

3.3 Data Collection

For clarity this section has been separated into the three research objectives and each section begins by clarifying the objective.

3.3.1 Objective 1: Provincial-wide review of fisheries dependence and poverty.

To identify the most highly fisheries dependent communities and those that contain the highest concentration of poor fisher households in mainland West Sumatra using two indices generated from routinely collected census and fisheries data. Secondly, to examine the relationships between poverty in fisheries and...
poverty in other economic sectors using a correlation matrix. Thirdly, interviews with staff from government agencies and field visits to 16 fishing communities checked the validity of the secondary data and began to explore which sectors of the fishing industry the poor work in and what are their needs and constraints.

The geographical extent of this review is restricted to mainland West Sumatra and does not include the Mentawai Islands because 1) the geographical isolation of the Mentawai Islands would require much greater time and resources to survey adequately and 2) the people groups and culture of the Mentawai Islands are different to mainland West Sumatra.

3.3.2 Objective 2: Livelihoods and poverty analysis

To analyse the household livelihood context of selected representative coastal communities in West Sumatra and to investigate the shape and form of poverty in those fishing communities.

The methodology proceeded logically though the following steps which are described in more detail in chapters 5 and 6:

*Identify enabling and constraining factors.* One of the most significant aspects of this research is the attempt to quantify the asset profiles of fishers. In order to do that, interviews with stakeholders in 25 fishing communities were conducted to identify which sector of the fishing industry the poor operated in and which enabling or constraining factors were crucial for their livelihoods.

*Create measures for each of these.* 31 enabling and constraining factors were identified and 43 measures (attributes) were created to score these on a range of bad to good.

*Choose representatives sites based on a clustering analysis.* Two sites were selected, a rural, isolated village where many of the population were fisher/farmers (Sungai Pinang) and a more industrial site where larger vessels were based (Carocok, Tarusan).

*Conduct interviews to score these measures.* Using a structured survey, 151 households were asked questions to elicit scores for each of the 43 attributes. At points of interest or where further clarity was required respondents were asked follow-up questions in addition to the survey.
The literature on the sustainable livelihoods approach offered some helpful advice regarding data collection and analysis which is relevant to the Author’s proposed research. DFID (2000) refer to the common problem of researchers overestimating the data required to understand different aspects of livelihoods and underestimating the time taken to process these data and obtain results. In reference to Rapid Rural Appraisal (RRA), McCracken et al. (1988) refer to understanding being found through the rapid build-up of diverse information rather than via statistical replication alone. This principle of triangulation, to confirm and complete data by using multiple sources and methods (Arksey and Knight, 1999), is crucial to build up an accurate picture of the “truth” in West Sumatran coastal communities. However, the multi-dimensional analysis described below added rigour and reproducibility to the qualitative aspects of this research.

3.3.3 Objective 3: Evaluation of existing livelihoods interventions.

To evaluate the suitability of previous livelihood projects in West Sumatra with the needs and constraints of the poor.

There were two elements to the data collection of this third objective:

Collating past and present project data. Livelihood improvement interventions, conducted by the provincial DKP between 2005-2009, were identified from government reports and by interviewing staff members. Government interventions were included if they were intended to directly improve livelihoods. Interventions from the first year (2012) of the current multi-agency program of poverty alleviation for coastal communities, G-PEMP, were also collated.

Case studies. While the past and present project data approach above was designed to quantify what had been done to help fishers, the case studies were aiming to explore the mechanisms that facilitate successful or unsuccessful implementation of these interventions. Because current government policy is to give funding and support through groups rather than individuals, three fisher groups were selected and group leaders, members of the group and local DKP
officials were interviewed to ascertain the factors contributing to success and failure of these groups.

3.4 Data Analysis

3.4.1 Objective 1: Provincial Review

A fisheries dependence index was generated using the data, total numbers of fishers, the percentage of the workforce employed as fishers and the total production of fish and shellfish. The data were normalised, weighted evenly and summed to generate a composite statistic.

A poverty index was created based on frequency and percentage of poverty from BPS data in 2011. These two components were normalised and combined to form a poverty index.

Fishing dependency and poverty amongst fishers were compared to dependency and poverty in all other economic sectors using a Kendall-Tau correlation matrix.

3.4.2 Objective 2: Sustainable Livelihoods Approach

*Identify enabling and constraining factors.* Factors were identified by analysing interviews and distilling recurring themes that were repeatedly raised by different respondents in different locations. These themes were refined to identify the generic factor that needed to be scored.

*Choose representatives sites based on a clustering analysis.* Four criteria were used to segregate locations using a cluster analysis, geographical isolation, fishing fleet, presence of an auction and natural geography. Data were analysed using a cluster analysis from the statistics package Multibase in conjunction with Excel. Clustering analyses were performed using 6 different measures namely; furthest neighbour, nearest neighbour, centroid, ward, flexible and group average methods.

*Multi-Dimensional Scaling (MDS).* With 43 attributes from 6 fields being scored for 151 households, the 6,493 data points plus additional commentary by the respondents were entered into a spreadsheet and analyzed using a multi-
dimensional scaling technique based on Rapfish (Pitcher and Preikshot, 2000; Pitcher et al., 2013) and using the R programming framework (R Development Core Team; www.r-project.org). Qualitative data were logged in the spreadsheet, highlighted and used to explain observations from the MDS plots.

3.4.3 Objective 3: Project Evaluation

Analysing past and present project data. Descriptive statistics were used to analyse the frequency and expenditure of each intervention. An asset analysis methodology was developed based on the principles outlined in Ashley and Hussein (2000). Each intervention was scored on whether it intended to improve human, social, financial, natural or physical capital. What is being measured is the presence or absence of an intended benefit in an asset category and not whether that benefit was realized. Intended benefits were compared with the fishing poverty sectors identified in chapter 5 in order to assess the 'fit' of livelihood interventions (Ashley and Hussein, 2000).

Interview analysis of the case studies. Interviews were recorded, transcribed and translated. Recurring concepts or phrases were highlighted and these were triangulated with other stakeholders in the same location and compared and contrasted with other case studies.