



Sustainable development since the 2004 Tsunami:

A Glimpse into the Fisheries of Hambantota District, Sri Lanka.

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This Master's Thesis is carried out as a part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.

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Abstract

Fish is an important source of protein for many of the world's population. For fish resources to be renewable marine aquatic ecosystems must be protected. This view is not held by all of those directly involved in fisheries. How those involved in fisheries are aware of and work in relation to notions of the importance of conservation of natural resources plays a role in illustrating how sustainable the fishery they work in actually is. The case of Hambantota district fisheries in Sri Lanka was chosen to investigate this element of sustainable relations between humans and natural resources.

This research has acquired information from several men working in fisheries of Hambantota district, in the form of interviews, conversations and observations. The men were asked a number of questions relating to fishing and their awareness of the importance of environmental conservation and sustainable development. Information illustrating the pressures faced by these men directing them away from sustainable fishing practices was also acquired in the interviews.

What was found was that the fisheries of Hambantota district were not suffering any substantial losses in fish yet, but that increases in fishing competition as well as many using illegal fishing methods has slowly the amount of fish caught per boat, according to many interviewers. Further, inflation and lagging wages were motivating fishery employees to catch ever more fish. With no immediate sign of improvement it was not unlikely that they would continue to want to further increase catches in order to maintain making living wages.

These trends seem to point to the less-than sustainable growth and development of Hambantota fisheries. While not currently facing any substantial aquatic resource drops overall it seems that it is moving in that direction. Since many of those involved in fishing do not seem all that aware of the importance of conservation it can be assumed that this unsustainable development may in part be blamed on the collective unawareness of the importance of aquatic resource conservation. Recommendations focus on increasing the awareness of the importance of aquatic resource conservation, while also enforcing regulations that are already in place.

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I want to thank UiA for a great master's program and the chance to get out in the world and see a whole lot.

Declaration

I hereby declare that the thesis:

*Sustainable Development since the 2004 Tsunami: A Glimpse into the Fisheries of
Hambantota District, Sri Lanka*

has not been submitted to any other universities than the University of Agder for any type of academic degree.

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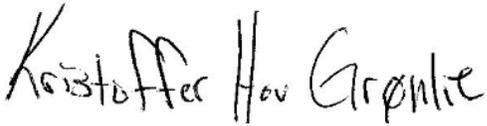
A handwritten signature in black ink that reads "Kristoffer Hov Grønlie". The signature is written in a cursive style with some capital letters.

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Abbreviations and Acronyms

ASA American Sociological Association

DFAR Sri Lanka Department of Fisheries and Aquatic Resources

EKC Environmental Kuznets Curve

FAO United Nations Food and Agriculture Organization

ICZM Integrated Coastal Zone Management

LTTE Liberation Tigers of Tamil Eelam

SLA Sustainable Livelihoods Approach

Chapter 1: Introduction

1.1 Background

Fishery Management is a significant part of many coastal societies. Poor fisheries management can lead to the depletion of fish stocks and the deterioration of coastal livelihoods resulting from unsustainable practices (Christie and White 1997:156). With a population of over 525 thousand (NA 2001), Hambantota District lay within Sri Lanka's coastal southern province. Dotting its coastline are several larger fishing harbours and numerous smaller fishing communities that employ several types of fishing crafts supporting the livelihoods of thousands of fishers and their families. As a result of the 2004 Boxing Day tsunami tens of thousands of lives and livelihoods were lost in a very short time along the coast in Sri Lanka. Not surprisingly the fishing industry took a very hard hit and the livelihoods of over a hundred thousand Sri Lankan fishers were suddenly placed in jeopardy (Del Re et al. 2007:121).

As a developing country, Sri Lanka has a number of poor people who struggle to sustain themselves. The post-tsunami reconstruction of the fisheries of the south has seen a great deal of both success and clear mismanagement in terms of developmental sustainability. Harbours have been reconstructed, others were built where there had not existed one before the tsunami, and others have not been reconstructed at all. Much of this has to do with the places where these developments occur as some districts have received more reconstruction funds than others in a disproportionate relation to the damage incurred by the tsunami (Gunawardena and Wickramasinghe 2010:3). Other factors have also fuelled this mismanagement, as pointed out by Christie and White (1997: 156) "On tropical coasts, poverty forces people to opportunistically search for employment, employ unsustainable methods of farming and fishing, and resist management from fear of income loss".

Theories surrounding the Sustainable Livelihood Approach suggest that compounding factors of social, financial, physical, human and natural capitals help to illustrate and identify "the needs of a local population and [...] the key opportunities that will ultimately benefit them" (De Silva and Yamao 2007:393). In the case of the fisheries of southern Sri Lanka this framework provides a clear lens through which the aim of this study may be understood.

The aim of this study is to find answers to the following question: How sustainable are the fisheries of Hambantota in light of coping with the tsunami and post-tsunami developments. Also, what are the attitudes towards sustainability in those regards?

1.2 Area of Study

Hambantota, the town where most of the primary data was collected, lay on Sri Lanka's southern coastline within the southern province and Hambantota district. Hambantota is also the district capital of Hambantota district. For many years Hambantota has been one of the poorer districts in Sri Lanka. This poverty was by all means exacerbated acutely as a result of the tsunami as what small fishing infrastructure that was in place was virtually wiped away. This placed substantial strain on many households economically dependent on family members working in the fishing industry.

In recent years however Hambantota has seen drastic development projects spring up. Largely thanks to investments from the Chinese these include a large port, an airport, cricket stadium, highway, railway and conference centre. While many of these projects are still underway as of May 2012, most important for this study was the relatively rapid construction in 2008 of the new fisheries harbour in the centre of Hambantota town, which lacked a permanent harbour before the tsunami. Many people in Hambantota are hopeful that these projects will bring substantial economic development to the region in a variety of sectors, and help to lift the economic standing of the district as a whole.

The community in close proximity to the Hambantota fisheries harbour are predominantly involved in fishing, salt production, commerce and agriculture. On weekends there are large markets in the town where peripheral farmers come to sell their produce. It was on a market day in 2004 that the tsunami had come and wiped out a significant number of the town's population, fishing fleet and other infrastructures. Without the substantial fisheries harbours that there are today to protect boats most were wiped out as the tsunami rolled over Hambantota.

What has come from the post-tsunami development of Hambantota fisheries is that they are now more advanced and more extensive than ever. There are more boats, with more engines, with more and better equipment than there ever had been before. This rapid advancement leaves the fish stocks with little or no chance of evasion. This is a looming question which again this study seeks to address: can such developments within the fishing industry be sustainable?

My personal motivation for choosing this area of study comes from a previous learning experience I had in a face to face session in May 2011 with the University of Agder and the University of Ruhuna, which took place in and close to Hambantota. The experience provided me with a network of contacts in the field as well the experience needed to find my way around Sri Lanka. More specifically it provided me with the opportunity to think of how Hambantota had fared after the tsunami, especially with the fishery which is for the most part one of its focal points. During my first visit I could see no obvious sign that there had

been any damage from the tsunami, and that there were in fact many boats crowding the fisheries harbor. This led me to question whether there could be measurable over-development of the fisheries since the tsunami.

1.3 Research Objectives

The main objective of this research is to assess the sustainability of the Hambantota fishery based on how fishermen perceive their experiences within the industry in terms of sustainable fishing practices. The study may illustrate the trajectory which the fishery seems to be taking and thus can help to paint a clearer picture of the sustainability of Hambantota district fisheries.

Objectives:

- Describe fishermen perceptions of their role in the fishing industry as their livelihood.
- Describe fishermen attitudes towards and observations of their own fishing practices in terms of sustainability.
- Describe fishermen opinions of the development of the Hambantota fishery since the tsunami in terms of sustainability.
- Identification of successful and failed developments in the Hambantota fishery which can be used to generate possible suggestions for improvements.
- Identify whether and to what degree the fishery sector in Hambantota can adequately provide for the sustainable livelihoods of the fishermen involved.

1.4 Methodology in brief

This study is primarily based on qualitative research methods including semi-structured interviews and participant observation as a supplement. Some figures and statistics which are qualitative in nature may however be presented as supplements. The qualitative nature of the interviews has provided more vivid accounts of how locals perceive their place and role in local fishery development.

Those actively working in and around the Hambantota fisheries harbour were interviewed. From those who merely repair nets, those who buy and sell fish to the inland communities to those who spend weeks at a time out at sea fishing were all interviewed at random in a convenience/snowball type sample centred on those who happen to be at the Hambantota harbour at the time of interviewing.

1.5 Thesis outline

The thesis is organized into chapters. Chapter 2 contains a literature review which presents the research topics in an academic light in relation to the research objectives. The methodology is justified and elaborated upon in Chapter 3. Chapter 4 is a presentation of empirical findings from the research while chapter 5 discusses those findings in relation to the theoretical framework. Finally, in Chapter 6, a conclusion is presented which aims to generate a number of suggestions.

Chapter 2: Theoretical Framework and Literature review

Chapter 2 reviews literature and generates a theoretical framework for the thesis. In three parts, the literature review begins with a broad overview of thesis-related subjects followed by an area of study section that provides specifics concerning Sri Lanka and Hambantota district before subsequently elaborating on Sri Lankan fisheries management. After the literature review, research questions are listed before finally presenting a theoretical framework intended for use in analysis of findings.

2.1 Literature review

Four sub-categories comprise this literature review. It begins with issues of sustainability and sustainable development. The subsequent section moves on to elaborate on relevant issues of coastal management, which is largely related to fishing. The third sub-category discusses environmental conservation. Finally, in the fourth sub-category, the sustainable livelihoods approach is reviewed.

2.1.1 Sustainable development

The environment in which people live is where development takes place. Both environment and development can be seen as two necessities of human life. The two are often at odds with one gaining at the expense of the other over time. In this regard Brundtland put it best when she stated that development should "... [meet] the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland 1987: point 27). Despite there being various understandings of sustainable

development the Brundtland notion of it will be referred to throughout this study for the sake of simplicity.

It is important to take into consideration environmental elements in developing countries. The Environmental Kuznets Curve (EKC) stipulates that after per capita incomes rise past a certain threshold, environmental degradation begins to diminish (Yandle et al. 2002:1). This can be seen in various developed countries where there often seems to be less environmental degradation than in countries where per capita income is low and environmental degradation seems to be high. A visualization of the EKC can be seen below in figure 1. Dinda (2004: 432) points out that within developing country contexts “People are too poor to pay for abatement, and/or disregard environmental consequences of growth” which can illustrate the degree of mismanagement of fish stocks by fisheries in the developing world. The EKC would then suggest that in order to improve the environment of a country the simplest way to go about it would be to develop quickly past the per capita income threshold. Despite the correlation on which it is based the validity of the EKC is debated with strong criticism discrediting it. The vast number of intangible variables inherent in both the environment and economy can be too numerous to boil down to a single bell curve directing all environmental and economic policy. “Although [the EKC] is crude, it can lead to faulty conclusions and ignores some factors relevant to sustainable development, it is worthwhile noting the basic theory and relating it to the environment/globalization debate” (Tisdell 2001:186). With varying degrees of accuracy the EKC both supports and detracts from Brundtland’s idea of sustainable development. In a way it suggests that reaching sustainable development can require economic development which may not be all together sustainable. The EKC then encourages economic development as a means of achieving sustainable development; in a sort of ends-justify-the-means way of thinking.

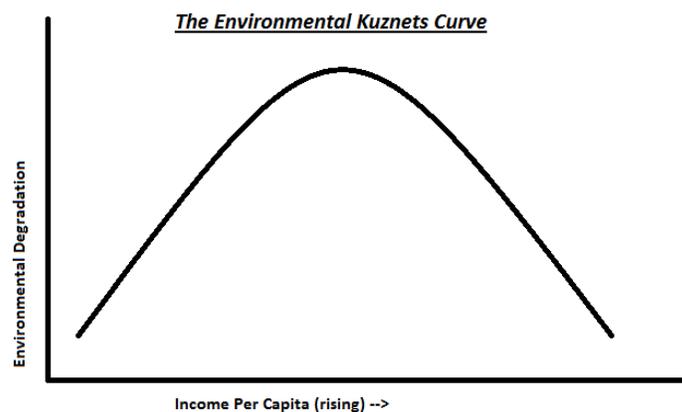


Figure 1. This curve shows that after enough development environmental degradation begins to diminish with further development. (Environmental Kuznets Curve. Drawn by Researcher. May 2013, Based on Yandle et al. 2002:2)

In terms of fishing, fish stocks and the environment the exact contrary to the EKC has been argued by Clausen (2008:1318) who writes that “increases in national economic affluence have deleterious effects on fish biodiversity. This result is contrary to the thesis put forth by ecological modernization theorists and adherents of the environmental Kuznets curve. The connection between economic production and loss of fish biodiversity conforms to the predictions of the political economy perspective, which argues that economic growth is ultimately unsustainable”. A clear example of this non-adherence to the EKC theory is the collapse of the northern Cod off the coast of Newfoundland and Labrador, which Hutchings and Myers (1994: 2126) concluded was “attributed solely to overexploitation”.

The sustainable development of the south Si Lankan fishing industry is indeed a challenging and complex endeavour that places both human livelihoods and the fate of renewable organic resources at risk. Indeed the question of whether to develop through the EKC towards a sustainable level of fishing or to substantially restrict fisheries development to prevent fish stock collapses are the two issues the fisheries of south Sri Lanka have to consider. To ensure fish stocks for future generations of south Sri Lankans these issues are vital in fisheries, fish stock and coastal management.

2.1.2 Environmental Conservation

With a potentially renewable yet limited resource such as fish sustaining many of the livelihoods of coastal peoples the importance of environmental conservation is plain to see. How this should go about may take several forms and may have differing focuses. In general, as outlined by Gray (1997:160), most of the dangers to fish stocks in coastal areas “are a direct result of human population and demographic trends”. Further, Grey (1997:168) writes about the greater marine biodiversity found in poorer countries where “they have less facilities, equipment, trained staff and resources available to devote to [...] conservation. In addition it is natural that their priorities focus more on food production and development than on [conservation]”.

These issues, as outlined by Gray are outlined in greater detail within the notion of overfishing by Pauly, Silvestre and Smith (1989: 309) who write that placing special consideration to the various types of overfishing can help “prevent alleviate or overcome [...] overfishing”. This is to in the end help to promote the conservation and health of the renewable fish stocks. Of these types of overfishing this study will focus on “economic overfishing [which is] fishing at a level of effort higher than the level which maximizes economic rent, i.e., the difference between gross returns and all costs” (Pauly et al. 1989: 320) and “Malthusian overfishing [which] occurs when poor fishermen, faced with declining catches and

lacking any other alternative, initiate wholesale resource destruction in their effort to maintain their incomes” (Pauly et al. 1989: 323). These two types of threats to fishing stocks will be demonstrated as having gained a foothold in the fisheries of Southern Sri Lanka in the post tsunami re development of southern Sri Lankan fisheries.

With greater fisheries size and more advanced fishing technologies these two types of overfishing compound each other and make the need for more advanced fishery management more apparent. The need to understand and manage the people and stakeholders involved in this process are a vital element in the effort to effectively manage a conservation effort. In this regard Norse and Crowder (2005: xvii) assert that “[...] understanding humans-who are both the cause and the victims of biodiversity loss- is as integral to conservation biology as is understanding biology”. Failure to consider the people involved in the overfishing threat can lead to fish stock collapse, which “is the endpoint of a process of the sequential elimination of many local [fish] populations by overexploitation and habitat degradation” (Norse and Crowder 2005: 32). These factors therefore demonstrate that good conservation must include thorough consideration of the sustainable livelihood approach of communities reliant on coastal fisheries. The sustainable livelihood approach will be discussed subsequently.

2.1.3 Sustainable Livelihoods Approach

Understanding poverty, and how people cope with it, is a matter that can be studied from various angles. Of the various ways to quantify and understand the challenges of those involved in fisheries the sustainable livelihoods approach (SLA) has been described as having a primary focus on people “using poverty indicators that they themselves define” (FAO 2005-2012: para 2). This approach has its advantages as its elucidation of the individual’s experience of poverty is congruent with a stakeholder analysis-type method, that is, an understanding based on what they themselves see as important. Further the SLA is useful because the principles of a sustainable livelihood correspond with those of sustainable development in general. Scoones (in Rakodi 2002:18) illustrate this compatibility by writing that a “livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resources base”. For this study and its emphasis on sustainable development the SLA’s advantages outweigh its disadvantages.

Despite its multifaceted notion of poverty, researchers using the SLA often find it difficult to “go beyond material motives and aims” in understanding a case (De Haan et al 2005:33). Further, subjects “are still bound by property relations and configurations of power which play such a major role in inducing poverty

in the first place [and although] transforming structures, mediating processes, institutions and organizations appear in all livelihood frameworks, there is a tendency within livelihoods studies to downplay these structural features and to focus on capitals and activities” (De Haan et al 2005:33). Employing the SLA together with notions of sustainable development, environmental conservation and integrated coastal zone management (ICZM-explored subsequently) can help to compensate for inherent shortcomings within the SLA.

2.1.4 Integrated Coastal Zone Management (ICZM)

With human and ecological activity taking place both on land and at sea there are more interrelationships between humans and nature on coastlines. Proper management of coastal zones, the natural resources and stakeholders involved, is important because growing (coastal) populations are putting ever greater strain on fish stocks. Brown et al. illustrate the specific and particular need for good ICZM in developing countries by writing that “where the livelihood imperatives of sustainability and access to resources are acute, integrating conservation and development can be promoted through timely and sensitively applied decision-making tools. These include identifying and promoting stakeholder interests and dialogue, envisioning and prioritizing environmental and social outcomes through decision analysis and facilitating appropriate institutional forms for delivering legitimate decisions” (Brown et al. 2002: 4).

Essentially ICZM emphasizes the inclusion of all sorts of stakeholders in the management of coastal issues. Ideally, assuming they have equal opportunity to express and assert themselves, these stakeholders could find a balanced way to share the coastal zone in a manner least harmful to both self and other stakeholders. This of course is easier said than done. And with inequalities of both wealth and power rampant in the developing world this equitable ideal is less realizable, also in Hambantota district.

ICZM has the capacity to include elements of environmental conservation, the sustainable livelihood approach and sustainable development in seeking to find lasting solutions to the problems of coastal development. Due to the holistic and inclusive attributes of ICZM it will be referred to throughout this study as issues relevant to it are brought up.

2.2 Area of Study

In this section, Sri Lanka, its south and especially Hambantota district will be outlined in order to give a general idea of the area of study.



Figure 2. The above map clearly shows that Sri Lanka has a long coastline giving it ready access to the sea. Map of Sri Lanka (CIA: 2013)

Sri Lanka is an island in the Bay of Bengal, off the south eastern tip of India which can be seen in figure 2. With a coastline of 1,340km and a land area of 65,610 square kilometres, Sri Lanka is the 122nd largest country in the world (CIA 2013). With the capital on the west coast, Colombo, Sri Lanka is divided up into 9 provinces, which are composed of districts. Hambantota District is found in the Southern Province.



Figure 3. Map of Hambantota District in purple (Deep South Sri Lanka).

Hambantota District occupies 2,609 square kilometres and has a long coastline stretching 151 km from east to west to its south (Hambantota District Secretariat: 2011). See figure 3. Traditionally one of the poorer districts in the country it has in the past years experienced rapid growth and development with the construction of a massive harbour, a cricket stadium and an airport. Some say these mega projects may in part be due to president Rajapakse having most of his political background in Hambantota and having a special preference for his friends there rather than in other districts. Others still point to the areas potential for development and strategic geopolitical positioning.

In 2004 coastal Sri Lanka, along with several other countries surrounding the Indian Ocean experienced one of the most destructive tsunamis of modern times. By the time the tsunami aftermath was over in Sri Lanka there were over 35 thousand dead, 21 thousand injured and 40 thousand either “widowed, orphaned, affected elderly or disabled” as a result (World Bank 2013). Further 150 thousand people lost their livelihoods including 75% of the entire Sri Lankan fishing fleet (World Bank 2013).

Sri Lanka has also experienced a decades-long civil war. The conflict between the Liberation Tigers of Tamil Eelam (LTTE) of the North and the predominantly Sinhalese government in Colombo ended in 2009 after the LTTE failed to gain independence. Though most events in the war took place in the northern parts of the country the South was not entirely unaffected. Tourism, which before the war had been a significant source of revenue, was almost non-existent. The south and the city of Matara (and Hambantota district) are in many ways Sinhalese Buddhist strongholds with relatively small Tamil populations. Since the war’s end there has been greater moves towards reconciliation, yet many on both

sides bear hard feelings regarding war-time events which may make a lasting complete peace difficult to sustain. Since the end of the war tourism in the country is seen as exploding, with many travel experts warning that now may be the last chance one has to see a Sri Lanka unspoiled by mass tourism.

Today Sri Lanka is geopolitically positioned between many great powers. The pearl of the Indian Ocean, as it is sometimes referred to, has an ideal location in the Indian Ocean which makes it an optimal place to build harbours due to its proximity to shipping lanes used by many great economic powers. Shipping goods from China to Europe, and oil from the Middle East to China make the southern coast a convenient place for harbours. Some call the many Chinese-built harbours along these shipping lanes part of the “string of pearls” which China uses to extend its influence abroad, at the disliking of both India and the United States. The large new Harbour in Hambantota is a very clear example of this Chinese trend in strategically located Sri Lanka.

The area where most of the research was carried out is called Hambantota district. The name Hambantota is derived from the name for ‘landing site’ used by immigrants from Southeast Asia that came to the region before the Portuguese colonial period (Deep South:ND). Historical records show that Hambantota has always been reliant on fishing (Deep South: ND), as it still is to this day. The many fishing villages within the district dot the coastline and have substantial harbours full of boats fishermen and Fish markets. The two largest cities in Hambantota district are Hambantota (city) and Tangalle, each with their own sizeable fishing harbours close to or at the city centres.

Hambantota district is divided up into 12 divisional secretariats. This study will only focus on data gathered from Hambantota divisional secretariat (figure 5) and Tangalle divisional secretariat (figure 4). Of the Hambantota district divisional secretariats, in addition to the two that were just mentioned, Ambalantota and Tissamaharama are also coastal divisional secretariats in Hambantota district. Below are maps of both Tangalle and Hambantota divisional secretariats:



Figure 4. Map of Tangalle divisional secretariat. The town of Tangalle lies in the divisional secretariat furthest west in Hambantota district. In this image it is outlined in green (Google.com 2013:A).

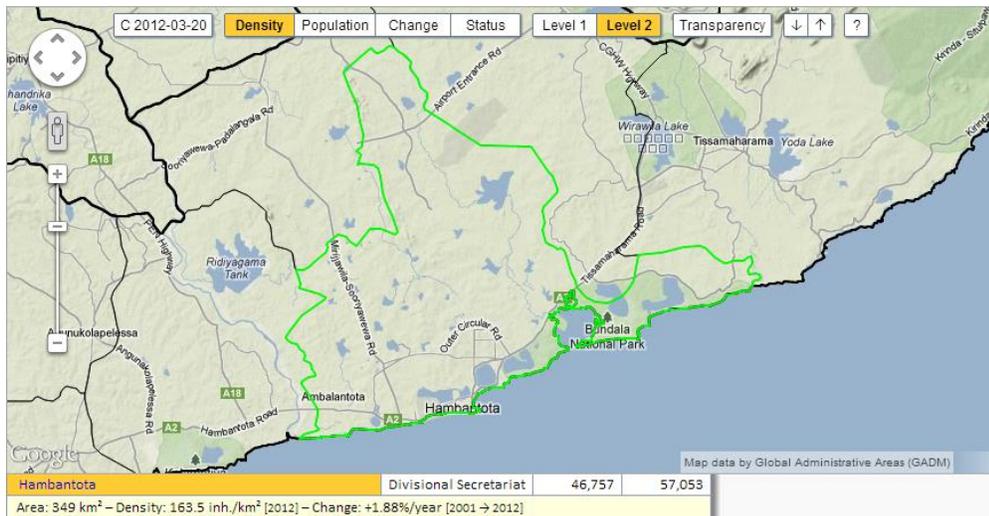


Figure 5. Map of Hambantota divisional secretariat. Hambantota town lies within Hambantota divisional secretariat in Hambantota District west of Tangalle and Ambalantota divisional secretariats. In this image it is outlined in green (google.com 2013:B).

2.3 Fisheries management in Sri Lanka

This part of the study illustrates the nature of fisheries in Sri Lanka from a variety of sources. Sri Lankan fisheries are much like the small-scale fisheries of many other tropical countries in the developing world. According to the Food and Agriculture Organization's (FAO) Fisheries and Aquaculture Department (2013) Sri Lanka's fisheries provided over 17 kg of fish per capita in Sri Lanka in 2004. Further it provide the primary and secondary (to fishing) employment to over 350000 people. With all the other industries involved in the production and logistics around it, the fishing industry involves over 1 million people in Sri Lanka.

As it is a small island nation fishing societies have existed in Sri Lanka throughout its history contributing much of the necessary protein in the national diet. As individual entities, small scale fisheries do not amount to much nationally, yet taken aggregately they assume a substantial share of fish production in Sri Lanka. Pauly (1997:1) asserts that "one of the characteristic features of tropical small scale fisheries is their marginality, that is, their geographic, socioeconomic and, ultimately, political remoteness from decision makers in major population centers [which is partially worsened by] lack of infrastructure (roads, markets, ice supply, communications)". Living remotely is thus a characteristic that keeps them from being able to gain a certain degree of affluence. Poor access to schools, hospitals, roads and other such services makes it difficult for fisher folk to generate a sustainable profit.

There are a variety of classifications and specifics in relation to fisheries in Sri Lanka. There are inland fisheries which fish in lagoons lakes and rivers. There are fish farmers and offshore fisheries. Coastal fisheries use a number of vessels; the spectrum is wide and includes a great variety. Some coastal fisheries use large multi-day inboard motor vessels, others use simple canoe-like boats while others still use no boats at all, merely pulling in fish with nets or lines they throw from the beach.



Figure 6. (Image taken by author: author and tour guide throwing net into water from the beach (2012))

Sorensen (1997:9) defines Integrated Coastal Zone Management as: “the integrated planning and management of coastal resources and environments in a manner that is based on the physical, socioeconomic and political interconnections both within and among the dynamic coastal systems, which when aggregated together, defines a coastal zone. An integrated approach requires both the horizontal (cross sectorial) and vertical (the levels of government and nongovernment organizations) coordination of those stakeholders whose actions significantly influence the quantity or quality of coastal resources or environments”.

Given its very long coastline it is no surprise that people have fairly easy access to the sea. With the exception of few older “management systems, most fisheries are open access, common property systems” (Samarayanke 2003:1007). When visiting coastal villages in Sri Lanka it is hard to see which fishing is managed and how it is done. Often you will find people along the side of the road selling a catch they themselves have caught earlier that same day. Who exactly is responsible for maintaining, managing and controlling this type of fishing?

According to the Sri Lankan government Department of Fisheries and Aquatic Resource (DFAR 2012) “the Fisheries and Aquatic Resources Act [of 1996], is the principle legal instrument governing the fishing industry of Sri Lanka” (para 1). Before this act came about in the 90s there had been regulation that dated back to 1940 established under the department of fisheries which faced a degree of growing pains,

especially as the fishing sector made significant changes in the 1970s. Further, with increasing populations and demand for fish came ever more un-regulated motorized fishing further from shore. “A major reason for present day problems in fisheries is due to the fact that proper management measures were not undertaken at the time of the introduction of motorized craft and synthetic nets which virtually revolutionized the industry” (Samarayanke 2003:1007). Coupled with growing environmental awareness and seeing populations expand the newer more comprehensive legislation refocused the legislation of the industry where it was necessary. Primarily the 1996 act sought to focus on the “management, conservation, regulation and development of the fisheries and aquatic resources of Sri Lanka” (DFAR 2012: para 5). Methods to regulate and manage the fisheries included banning dynamite, issuing fishing licences, regulation of fish imports and exports, limiting fishing seasons and designating fishing-free areas (DFAR 2012: para 9).

The role that Hambantota district, Hambantota and Tangalle divisional secretariats play is to provide the provisions set out by DFAR in relation to their specific management plans. This includes issuing licences and legal enforcement by police of fishing restrictions. Samarayanke (2003:987) argues that fish resources in Sri Lanka have been over exploited mostly due to improper management. Improvements to which could ensure that fish resources remain a productive and sustainable asset to the population for coming generations.

2.4 Research Questions

The main focus of this research is to assess the sustainability of Hambantota fisheries based on how fishermen perceive their experiences within the sector in terms of sustainable fishing practices. The study may illustrate the trajectory which the fishery seems to be taking and thus can help to paint a clearer picture of the sustainability of Hambantota district fisheries.

To realize the objectives the below questions were drawn up to shed light on each point individually.

- Fishermen role
 - How do fishermen believe legal restraints on fish effect their work and livelihood?
 - Have fishermen noticed better or worse working conditions?
- Ideas of sustainability
 - Do Hambantota fishermen believe that their fishing is essentially sustainable?

- What methods of fishing are unsustainable and what amount of fishermen adheres to these methods?
- Have they noticed any rises or losses in average catch sizes/quality?
- Have they noticed any changes in the amount of time it takes to catch a particular amount of fish?
- Have they noticed a change in the previous two variables since the tsunami in 2004?
- Views on the development of fisheries in Hambantota district.
 - Are there more or less active fishermen in Hambantota district harbours since the tsunami?
 - Are there more or less active fishing vessels based in Hambantota district since the tsunami?
 - How have fish prices changed over the past decade?
- Successful and failed developments in Hambantota fisheries.
 - Which changes to the fisheries in Hambantota over the past decade have had a negative effect as a whole? Which have had positive effects?
- On Hambantota district fishery ability to sustainably support livelihoods.
 - Are Hambantota fisheries' daily functions socioeconomically equitable?
 - Are those relying on fishing as a living able to support themselves and/or family members?
 - Are fisheries growing at a rate that will not exhaust fish stocks?

2.5 Theoretical Framework

It is common knowledge that the world has witnessed collapse in fish stocks before and that there is no guarantee that it cannot happen again. Most famous was the collapse of the Atlantic northwest cod fishery in the early 1990s. This was a result of overfishing aided by advanced fishing technology and poor aquatic resource management. The troubling thing about the Atlantic cod fishery collapse was that it happened in a part of Canada where most might expect fisheries to have been able to foresee and avoid such a catastrophe. Ecosystem resource health that is overexploited to the point of collapse jeopardizes the ability of people in the future to enjoy the same resource. Good fishery management maintains the health of the ecosystems that the fisheries extract these resources from. This is part of making fishing sustainable. Although the issue sustainability in fishing is a global challenge I will focus my research to Fisheries in Hambantota District, and two harbors in particular within that district, Hambantota (town) and Tangalle.

On the ground this amounted to identifying whether and how certain elements of the local fisheries were in fact moving towards or away from sustainable fishing. Often this implied identifying whether fishermen were in any way, legal, normative or economically, restricted/motivated in the way that they could or should go about fishing. It was also necessary to identify whether these restrictions or limitations had any element of sustainability to them, or if they had come from elsewhere.

This study also explores whether and how fishermen can make a living using sustainable methods of fishing. The ability of sustainable fishing methods to compete with those using methods that are not sustainable is explored. If a non-sustainable fisherman and a sustainable fisherman each had their own resources the non-sustainable would win with a lower fish price at the market over the short term, but the sustainable fisherman's fish stock would outlive that of the non-sustainable fisherman and would thus win over the long term. Sharing a resource would mean that both the sustainable and non-sustainable fishermen would both fail if the resource suffers from the action of the non-sustainable fisherman. Thus the ability to have fish at all as part of ones diet in the future may come at the expense of having to pay higher prices for fish today. This is difficult in the developing world where poverty is a significant problem, and an acute threat to the sustainable development of the fisheries. Despite the challenge the ultimate goal is sustaining the regenerative resources that the ecosystems provide.

The sustainability of fish stocks is of vital to all people dependent on fish as a food source. For there to be affordable fish available to the people over the long term it is essential that the resources are not over exploited yet remain available to some degree to all. Fisheries management policies must then take into account, the needs of the consumers on land, those trying to make a living in fishing as well as the health of the ecosystem where the goods are generated. Such management, if it functioned well would undoubtedly be good for all involved.

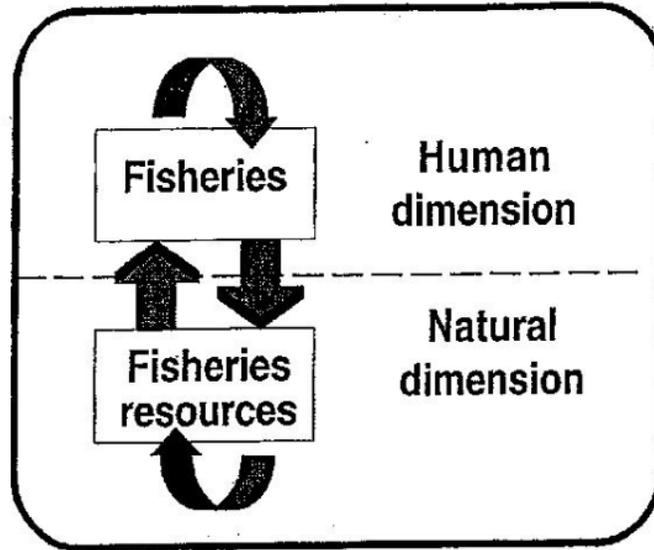


Figure 7. The image illustrates that there is an interrelation between fisheries and the fisheries resources that affect one another. Pauly and Silvestre (1997:14)

The “fishing system,” or the interaction between the human and natural dimensions of fishery management, is clearly illustrated above in the schematic by Pauly and Silvestre (1997:14). Despite the apparent simplicity of the above diagram most factors involved in fisheries management in this research can fall within these two groupings. Among other factors, socioeconomic, political and technological issues would fall into fisheries side while fish stocks and aquatic ecosystems would fall into the fisheries resources side. The arrows are intended to represent the interaction between human and natural elements which influence the action and reaction of each other.

With these ideas in mind the research sets out to identify the general health of human and natural resource symbiosis sustainability of the Hambantota fisheries with a special focus on the perceptions of fishermen of the developments over the past decade. Looking at what some have written on the health of aquatic marine ecosystems close to the Hambantota coast line allows the research to illustrate the natural half of the schematic to complete the picture of fisheries management in Hambantota district.

Chapter 3: Methodology

This section outlines possible methodology methods as well as the ones used in the research. It begins with a general outline of methodology methods that are available to use, while the second part justifies the

choice of the methodology which was chosen to use in this research. Using experience from the data collection process certain challenges are illustrated and limitations to the methods used are identified.

3.1 General methodology

Research methodologies will be elucidated in the following section. These are quantitative and qualitative research methods. Since all three could have been used to some degree, one has been chosen in place of the others. The section on quantitative research will illustrate its strengths while also justifying why it was deselected by pointing out its weaknesses for this study. The subsequent sections on qualitative research will illustrate its strengths while also pointing out the methods' limitations. Further the idea of mixed methods will be explored as to how the method could have been useful before justifying why it as well was deselected as a research method.

3.1.1 Quantitative research

Quantitative research methods use numerical representations of subject matter to find out what if any effect one thing has on another. These methods mainly help in identifying correlation values and this has great scientific value as results may be easily compared with wider areas of study in the same field. Being deductive in nature quantitative research seeks to test theories based on positivism (Bryman 2008:22). Generally larger sample sizes in quantitative methods make such research more generalizable. Yet these methods are not all-encompassing and do leave much left to be desired when it comes to certain types of subject matter. Identifying people's own perceptions and interpretations is not easily accomplished using a strictly quantitative research methodology as the essential goal of quantitative method is to gather numerical data. Though altogether not impossible, thorough quantification of narratives may understandably seem both an elusive and daunting task.

Quantitative research requires larger samples to warrant a statistical viability, and in many ways does not require the researcher to necessarily be involved with the study matter itself. Like calculations of data from a census, the researcher may never really need to actually meet the people that the census represents. Like a census in many ways data for a quantitative analysis is collected using questionnaires that restrict the freedom of response to one of fewer possible choices. The numbers may lack the ability to tell the whole story.

With smaller sample sizes, like the one in this research, using quantitative methods would offer little in terms of statistical validity as the number of subjects is too few. It was thus more appropriate to capitalize on the more in-depth qualitative method of analysis which allows for smaller sample sizes and which will subsequently be elaborated upon.

3.1.2 Qualitative research

Qualitative research is inductive in nature and seeks to generate theories (Bryman 2008:22). It covers areas where quantitative research cannot reach. It is concerned with the in-depth areas of the subject's perceptions and even their narratives. Instead of aiming to quantify variables it seeks to explore what variables and issues there are within the field. With the researcher often deeply involved with those being studied the context comes from the common area where the researchers and subjects find themselves in the field, a potentially unique place not necessarily like another.

Qualitative research does not necessarily require large sample sizes to be valid the same way as quantitative does. Though larger sample sizes are in some ways better, the ability to manage such large amounts of data makes ever larger sample sizes superfluous to the goals. Where the true strength of qualitative research comes in is in its ability to more clearly illustrate a picture containing more of the complex intricacies experienced by the subjects.

There are many research designs that can be employed as part of qualitative research. One of them is the case study which seeks to concern itself with the "complexity and particular nature of the case in question [such as] a single community" (Bryman 2008:52). Case studies also involve, among others, methods such as interviews and observations which were found useful to the data gathering process. These methods allowed the researcher to gain valuable insight into the perceptions and experiences held by the people questioned by allowing them to more freely express themselves in considering issues pertaining to their lives.

3.1.3 Mixed Methods Research

Mixed methods research, as the name suggests employs both qualitative and quantitative research methods. It seeks to make up for what lack in quantitative and qualitative methods on their own and by combining the strengths of both in attempting to generate a sum that is greater than the sum of their parts.

Of the challenges that mixed-method research poses is the reconciliation of the two research methods it employs which can sometimes seem incompatible due to the underlying goals the two methods have. While one seeks to generate hypotheses the other seeks to test hypotheses. Having more data as a result of using two methods might seem like a positive characteristic for research yet it may not always be necessary, appropriate or manageable. Bryman asserts that “mixed methods research, like mono-method research, must be competently designed and conducted. Poorly conducted research will yield suspect findings no matter how many methods are employed” (2008:624).

Bryman makes a good point when he writes that “mixed methods research is not intrinsically superior to mono-method or mono-strategy research” (2008:624). It is in part based on this notion that this research has opted away from employing methods outside the qualitative scope. As the researcher works alone it seemed conducive to the completion of the research that it remain as simply designed as possible. If the research had employed mixed methods there could have been greater data management demands placed on the researcher and resources which in-turn could have diluted other efforts and resources that were necessary in the research process. Such constraints include limited time in the field as well as limited financial resources.

Practical reasons for opting out of quantitative methods and mixed methods were essentially to keep the research process manageable and doable within the allotted time in the field and within the budget allocated for the fieldwork.

3.2 Choice of Methodology

In the following paragraphs the methodology of the research will be elaborated upon. Why specific aspects were chosen or resorted to as well as how they worked in practice will be explained in each part of the research process. Chapter 3 ends with a subsection dedicated to describing overall limitations and challenges inherent to the methodology of this research.

3.2.1 Research design and methods

The Case study design was chosen for this research in order to gain a full understanding of the perspectives of Hambantota fishermen on the issue of sustainability within the Hambantota fishery. The villages or towns of Hambantota and Tangalle were chosen for data collection as they are both coastal towns with fishing harbors that are easily accessible. The two villages lie on the coast of Hambantota district and can be considered part of the Hambantota district fishery.

Tangalle and Hambantota (town) are both coastal towns on the coastline of Hambantota district and are in many ways similar. Hambantota was chosen as the primary place to gather data but with very few interviewees in Hambantota the research looked outside the confines of the village to the neighbouring village within the district. With only 50km between them the two villages are in many ways very similar as their fisheries harbors are more or less similar in size. Most important though, fishermen from both harbors often fish in many of the same waters and dock in each other's harbors. The decision to gather data from Tangalle was largely based on the need to gather more data. That the research would become more generalizable due to the increased sample size was not an ambition, but rather, it was felt that increased sample size was felt by the researcher to be a necessity.

The global trend of dwindling fish stocks due to over fishing (Pauly et al. 2002: 689) has provided the theoretical context underpinning the research as a whole. As it takes the loose form of a case study the research is guided in part in generating theories that might explain how and why unsustainable fishing practices may be occurring in the Hambantota district fishery. Case studies seek to generate, according to Bryman, "detailed and intensive analysis of a single case [and they are] sometimes extended to include the study of just two or three cases for comparative purposes" (2008:691). Thus this study observes the practices and attitudes of those involved in fishing in Hambantota district within the context of what theories of sustainability assert are good practices for future health of the fishery and the marine aquatic ecosystems from where they acquire resources. This of course will also include the element of fisheries management and how it is involved in said sustainability.

Throughout the research process the intention was to employ interviews within a qualitative structure. It was assumed that these interviews would be conducted one-on-one between the researcher and the interviewee (and interpreter). These were intended to essentially generate data that would then be easily compiled and compounded with observations made by the researcher. In practice the data collection process went from being mainly interview-based to focus group based due to the practical availability of

people to interview. Thus the design came to include observation, interviews and focus groups. It is easily recognized that the research would be very difficult to replicate and does involve the bias of the researchers own perceptions. Despite this, it is not unfounded to assume that the research can achieve some of its goal of shedding light on the perceptions of those involved in the fisheries of Hambantota district.

3.2.2 Sampling

The research needed data from those involved in the fishery of Hambantota district, and more specifically of those working in, around, and off of the harbors. This would then include fishermen, boat owners, and wholesalers and how they deal with each other and essentially manage the fishery. Varying age groups would also be attempted to have represented within the sample. The researcher also had as an intention to include as many women as possible in the sample; however non-existent women in fisheries seemed to be. Diversity of the sample within the fishery was important to the researcher because interviewing people with differing roles provides a larger picture elucidating the way the entire fishery functions as a whole.

Before collection of data began the idea was to collect data from at least 25 people involved in Hambantota fisheries. The researcher ended up with data from 30 people either through one-on-one interviews or as part of focus groups. Most of the sampling occurred in and around Hambantota or Tangalle harbors. The selection of people occurred most often by going to these harbors and asking whether anyone was willing to be interviewed. From there the efforts took on a snowballing tactic to gain access to those willing to give information with those who could not or would not suggest others who might. Thus, in either one-on one interviews or as a focus group data from 30 individuals working at either Hambantota or Tangalle harbors was gathered. See figure 8 below.

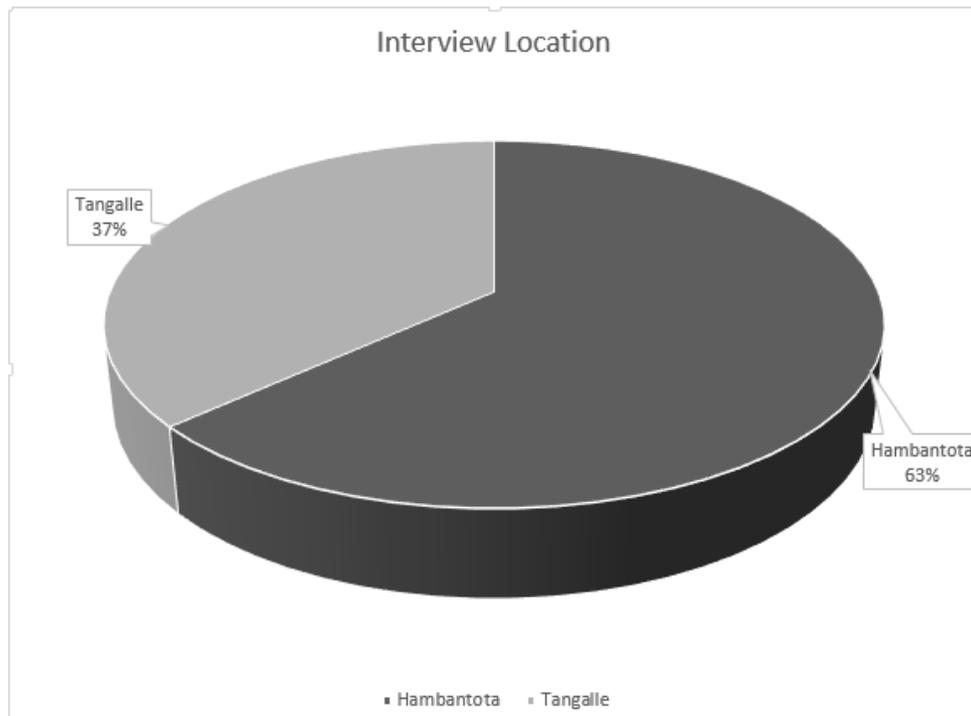


Figure 8. Harbors where respondents were interviewed.

The way sampling was conducted was primarily opportunistic in nature, with snowballing allowing the research sample to take shape based on the path of least resistance. The primary limitation of such snowball sampling is that “it is very unlikely that the sample will be representative of the population” but since such representativeness is more important for quantitative methods it seemed like less of an issue in this research (Bryman 2008:185). Despite its less-than-random characteristic the sample did provide a variety of people socioeconomically, geographically and in age demographics. All of the interviewees could be found either in or within close proximity to either Hambantota or Tangalle harbors. Of the 30 men (no women) from Hambantota district sampled there were nineteen individuals from Hambantota (town) Harbor and eleven from Tangalle Harbor. Please refer to the appendices for the corresponding data as well as figure 8.

3.2.3 Data collection

Data collection took place during the second and third weeks of February 2012. Most of the first instances of data collection occurred in Hambantota (town) harbor, while data from Tangalle took place primarily in the latter half of the data collection period. The data collection began in Hambantota town because that

was where the researcher and the research assistant were living at the time. After it was deemed that the Hambantota harbor had been given its due diligence the research moved to Tangalle where the researcher eventually relocated.

Gathering data in Hambantota (town) was a simple process for the researcher because the research assistant lived nearby the harbor. This allowed for them to collect data when it was both convenient for them as well as when fishery workers had 'down time' from work and could answer questions. On a couple of occasions the researcher approached groups of older men assembled repairing fishnets. Their task allowed for them to talk without getting in the way of completing the work at hand which made them open to the idea of being interviewed.

What began as an interview of these men one at a time quickly transformed into a focus group as the other members of the group did not hesitate to join in on answering the questions. This led the researcher to then collect data specifications (age, gender, occupation, location) of each person individually before then recommencing the interview in a focus group format in order to not let the individual data go to waste. The interview had few if any strongly diverging opinion and the men seemed to be in accord with each other on most matters that had to do with the Hambantota fisheries. Most of these men used to be fishermen but now, due to their age, restrict themselves to less demanding maintenance work onshore. These men provide especially good insight into how the fisheries of Hambantota district have changed over time. There were also fishermen and wholesalers interviewed in Hambantota (town) some of these were also interviewed in the same manner as the older men repairing nets; interview-turned-focus group, while there were some that were interviewed one-on-one (with the research assistant/interpreter).

The interviewing in Tangalle took place less leisurely since the researcher could only conduct interviews with the assistant/interpreter who lived 50 km away in Hambantota (town). This often meant that on several occasions when we were available to go do interviews those working at the Tangalle harbor were either too busy to give an interview or they were not at the harbor. Nevertheless those that the researcher did get a chance to interview provided information quite similar to that of those interviewed in Hambantota (town). One boat owner/manager was interviewed in both Hambantota (town) and Tangalle harbors. Furthermore, two wholesalers were interviewed in Hambantota (town) and none in Tangalle. While there were several maintenance workers interviewed in Hambantota (town), none were interviewed in Tangalle.

The research assistant/interpreter was a fellow student of the researcher who lived in Hambantota (town) and had several connections in the area. He accompanied the researcher on all interviews/focus groups. He helped organize when to attempt to conduct interviews/focus groups and was made aware of the need to

obtain informed consent from those being interviewed as well as of letting informants know that results would remain anonymous. Given his knowledge of Sinhalese and of the nature of studies like his own, the researcher was a valuable asset to have involved in the research process as he was easily able to make information obtained from the informants understandable both in English and in terms of the intentions of this study.

3.2.4 Data analysis

This research will employ grounded theory as a framework for analysing the collected data. Bryman says that grounded theory, a framework for the analysis of data, is “concerned with the development of theory out of data [and that] data collection and analysis proceed in tandem, repeatedly referring back to each other (2008:541). Among the tools used in grounded theory utilized in this research is coding whose form emerges after data has been collected (Bryman 2008:542). This means taking qualitative data and coding it so that patterns and concepts may more easily be analysed. The questionnaire that was used in the data collection helps to bring about this tool by asking questions related to different topic on fisheries management and sustainability in fishing practices. By reviewing the notes taken during interviews/focus groups/observations and then coding the general sentiments felt by the informants with regards to their perceptions on sustainability and whether or not developments within the fisheries were good or not, the researcher can then identify whether or not any pattern exists. Further, by drawing upon what individuals or groups have asserted, additional information may be added to add more clarity in answering research questions. Additionally, many aspects that the researcher had not foreseen emerged.

The analysis section of this research will provide a full breakdown of the analysis process. It will discuss themes derived from the collected data in order of descending relevance and importance and with regards to the specific research questions and empirical findings.

3.2.5 Limitations and challenges

As with more or less all research this research had its share of limitations and challenges. These included not only what one would consider as normally inherent in the methods used but also having to do with practical considerations that came up in the field. The purpose of this section is to address any or all limitations and challenges faced by this research.

The limitations and challenges that were inherent in the methods chosen are important to note. As this is a qualitative study, results will be less generalizable than if it had been quantitative. This means that whatever value this study does have will pertain most especially to those interviewed.

Grounded theory as a qualitative research framework also contains limitations that have to do with the question of whether researcher using grounded theory “can suspend their awareness of relevant theories or concepts until a quite late stage in the process of analysis” (Bryman 2008:549). By having preconceived ideas in mind when going into research it limits a researcher’s ability to truly adhere to the precepts of grounded theory. Further Bryman (2008:549) cites the practical and time-consuming processes involved in grounded theory that may hinder the proper completion of the framework.

The purposive snowball sampling that took place may have certain limiting elements involved. Certainly the representativeness of the sample may not reflect the greater fishery population. The *ad hoc* nature of how most of the informants were acquired leaves a truly random system left to be desired. For example, if we visited the harbor on a Friday most of the Muslims involved in the Fishery would have been elsewhere attending to religious obligations. The snowball purposive sampling method leaves out the controlled element of a proper representative sample. This however is accepted as part of the nature of snowball sampling and accounted for. Further, there was not one single woman in the sample. This is most likely not a substantial limitation as women in Sri Lankan society, it seems, are not supposed to work in fishing. The interesting point here was that the researcher expected to find at least one example of women involved in the fishery in some capacity.

Interviewing has some manifest limitations. Semi-structured interviews can produce large amounts of data that goes unused. This may in some ways be seen as being at the expense of the researchers time which could better be put to use in other areas. Further, this large amount of data, if not recorded carefully can accumulate and confuse when the time comes to sort it out. Further, it is hard to tell whether those interviewed feel any pressures to lie about certain issues brought up in the interview. Qualitative methods let you gain some of their perceptions, not read their mind. So whether or not the data will completely represent the reality of what their perceptions are can never be known for sure. Nevertheless, interviewing provides a lens into the perspectives of the informant that might not show up in a more structured interview, so in that way it has an advantage that can provide insight.

Focus groups, which this study originally did not intent to employ, are full of limitations. In addition to many of the issues present in the interviewing of one person the group dynamic quickly becomes apparent when the group reacts to the questions, especially in terms of those in the group who are dominating, and other who seem more passive. In one focus group all the talking was performed by two of the older group

members while the others said less. Again, one can only speculate as to the motives for why some chose not to speak up. Whether it was out of self-preservation, respect or lack of opinion cannot be known. The groups' response to many of the questions was almost always unanimous. Though given the passive participation of most of the group members it is hard then to say whether the unanimity of the group actually represents the opinions of the group as a whole or if the group response was simply high jacked by the dominant members.

When what was supposed to be one-on-one interviews turned into focus groups much information may have been quelled. The more passive voices of the group were essentially subdued due to the more loudly voiced opinions of the more dominant group members. This could have resulted in the exclusion of important and indeed deviant opinions that may have been able to enrich the study. Further, the recording of data from a focus group as an interview meant that many of the interview answers for many of the individuals were exactly the same. This data format shift may have numerous limitations that the researcher may not grasp, but certainly it demonstrates that plans for conducting research do not always materialize as expected and may thus have in some way generated less than perfect data.

The language barrier was a strong limitation mitigated in part by the researcher assistant/interpreter. This mitigation is however based on the interpreter's ability to convey information from informants in a manner that does not include his own opinions or biases, and that his skills in the interpreting allow for him to understand and convey ideas with equal clarity in both Sinhalese and English. For this there was no guarantee as the researcher had no time or means to test this. Essentially this means that a large possible limitation to all the data gathered may be based on the possibility that language interpretation may have been conducted less than perfectly.

Participation observation has its limitations. There is no doubt that the researchers presence was noticed during all observations made. The researcher noticed that many of the people in and around the harbor looked at him approaching even when he was 300-400 meters away. Essentially this made the researcher seem like he was the outsider that he was. There is no guarantee that people being observed will behave as usual with an outsider in their presence so it may not be certain that information gained from observations will be entirely valid.

The process of being interviewed may have an effect on the answers people choose to give. What a respondent might say to a colleague in casual conversation may not be the same as what they choose to say in an interview because he or she might feel pressured to give answers that others have previously deemed as right. This may taint the quality of the data collected, as the true perceptions of those interviewed may not have fully been acquired.

Challenges may often involve what the researcher may not grasp. Although this research does take into consideration a great deal of information and brings into question many variable it is possible that some overarching and even vital themes may have gone overlooked. With this in mind, this research cannot say that it is some sort of breakthrough that explains everything or anything and that it is immune to the scrutiny that it very much deserves. This research is what it is, and like most other pieces of research that means limited.

No matter what the context, it may be important in almost all settings to take a solid ethical stance. Often this might mean adhering to a set of ethical standards to ensure ethical credibility of results. Although they were not seen to have been much of an issue or impediment, ethical challenges were addressed in the undertaking of research. In particular the ethical standards of a code of ethics by the American Sociological Association were adhered to. Of the three main ethical standards outlined by the ASA (2008:7), the first had to do with professional and scientific standards. This entails acting to the best of their ability in relation to honesty and integrity by avoiding deceptive and dishonest practices. The second ethical standard has to do with competence which means that researchers should only seek to undertake what they are qualified to do. Further they should not conduct any research if it in any way poses a threat of any kind of harm to either themselves or those they are studying (ASA 2008:7). The last ethical standard has to do with the “representation and misuse of expertise” (ASA 2008:7). This includes guarding against “personal, financial, social, organizational, or political factors that might lead to misuse of their knowledge, expertise or influence” (ASA 2008:7). Also it encourages researchers to honestly identify and mitigate any or all limitations in their work as well as misuse of their work (ASA 2008:7).

The researcher and research assistant/interpreter attempted to the best of their ability to adhere to the above mentioned ethical standards. Throughout the data collection portion of the field work interviewing was always presented as a voluntary and anonymous interaction. The informants provided consent after they were made well aware of the intentions of the researcher. The data that was collected has been presented no one besides the researcher himself. The likelihood that any of the data gathering may have in any way lead to any harm of any of the informants seems very unlikely.

Chapter 4: Empirical Findings

This chapter will present the empirical findings of the researcher. It will be organized in terms of the research questions earlier in this study.

4.1 Role of those involved in Hambantota Fisheries.

It is rather obvious that many of those involved in the fisheries for the most part see their roles within the sector as based on their occupation. Boat owners organize fishing expeditions and hire fishermen to help them. Fishermen harvest the aquatic marine resources for a wage and when they return to harbor they give the catch to the boat owner who then sells it on to the wholesalers who then get the fish delivered to markets near and far. While this may be true for the most part asking them was expected would gauge whether they thought of their role as having any greater meaning, or whether the researcher's assumption of what they thought their role was, was actually true.

By and large those interviewed saw their role as their occupation, a means for making a living whether it was management, maintenance, fishing or wholesaling. Figure 9 illustrates the composition of respondents based on occupation below. All of them were sure that the role they played within the industry was as a service for the means to provide for themselves and their families. Some of the maintenance workers explained that their growing age made them less useful working as fishermen as they had for many years prior to the transition to maintenance work. They saw themselves as playing a role in the proper functioning of the fishing efforts and believed that the work they were doing was important.

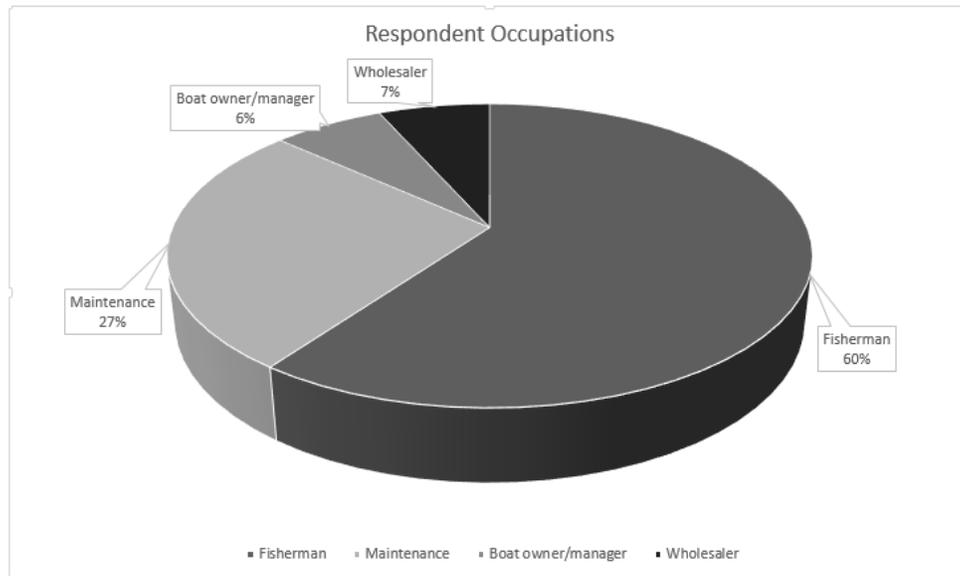


Figure 9. Respondent primary occupation. The above pie chart shows the primary occupation of the respondents.

All of them expressed through dialogue that they understood that fish was one of the most important protein sources for Sri Lanka as a whole and that that Hambantota was no exception. It was recognized that involvement in the fishery implied that they were contributing in some way to feeding the people of Hambantota and perhaps also the rest of Sri Lanka. Acknowledging that their role in part entails contributing to the feeding and nutrition of the country they in a way are aware that in the bigger picture their roles, although small, aggregately on a national level have great national importance.

Some of those interviewed were parts of families which had been involved in fishing for generations. Whether they saw this as some sort of legacy was not clearly articulated by most of them but some did think that their role within the fishery was an aspect of pride for them and their families and that a role they played was upholding this sort of legacy. Although the number of generational fishery workers employed were few it may not be impossible that there is a fishery culture present in coastal Sri Lanka that plays a role in the national level of fisheries.

4.2 Notions of sustainability

This section elucidates notions of sustainability as described by respondents.

Pretty much all of those interviewed were aware of the notion of sustainability and that it was an issue that many might consider applicable to their fishery and the fish stock from where they extract their resources. They seemed to understand that it was possible to exhaust fish stocks, which had happened elsewhere in the world before. They also understood that there was no way for certain to see whether fish stocks were dwindling or in trouble. What varied among them was whether or not this was an acute problem that deserved the substantial devotion of time and resources to deal with. Figure 10 illustrates how many of the respondents felt that sustainability was an issue for them.

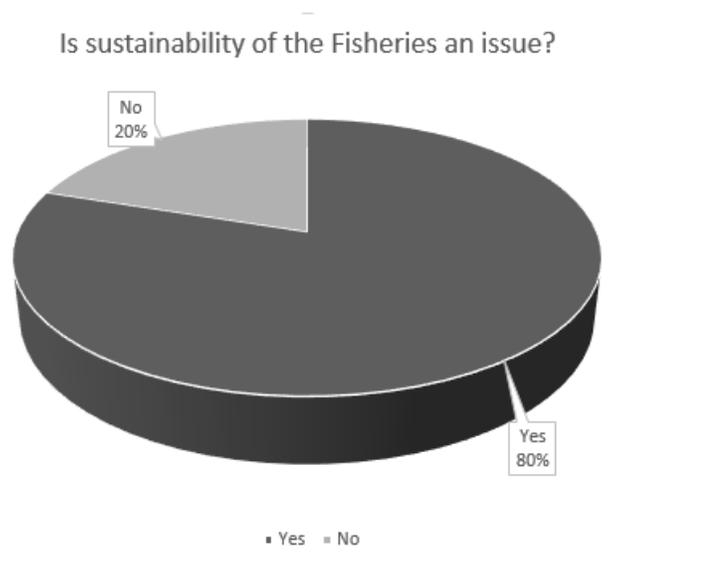


Figure 10. Respondents on whether sustainability is an issue.

Many of those interviewed referred to their experiences at sea and onshore over time to refer to any changes in things that might indicate that sustainability is indeed an issue that might or might not be relevant. They were asked whether they had observed any changes in fish size, catch size, by catch, effort changes, price changes, larger fishing areas, technology changes and the change in number of those involved in fishing.

There are many factors that are intertwined as symptoms of an over fished fish stock (Venkatachalam et al 2010:167). When the same levels of effort remain constant in fishing while the size of the individual fish caught is reduced then that is a sign of over fishing. Further, if the total weight of fish caught using the same level of effort is reduced it is also another symptom of over fishing. When Fishers set out to fill their

boat with fish and it takes longer time to catch the same amount of fish it is also a symptom. When fishermen seek to fill their boat with fish and resort to fishing in ever further out waters it is a sign of over fishing. When the Fishermen catch more and more of other types of fish that they did not intend this can also be a sign of over fishing. While all these symptoms are experienced to some degree in every fishery they do not always indicate that the fish stock is necessarily in immediate danger of collapse. When all of these trends occur simultaneously, however, it is often cause for concern.

Technological advancements were believed by almost all of the respondents to have improved the lives of all those involved in the procurement and consumption of fish in Sri Lanka. Respondents shared the rather grim views of what their level of fishing entailed in terms of effort before most fishing in Sri Lanka became motorized and before synthetic fibres came on the scene and replaced biodegradable work equipment. The advancement of preservation of catches with ice and the motorization of distribution were also great steps forward that brought affordable fish to the mouths of many. Though there was a widespread acknowledgement of the benefits of the advancement of fishing technology there were several respondents suggesting that some of these may not have been to the long-term benefit of the cohabitation of people and fish stocks. In particular they cited newer, often illegal types of fishing nets which were indiscriminate in what they extract from the sea. These nets were described as habitat destroying, and generally not good for the regenerative capabilities of the fish stocks and their ecosystems.

Respondents pointed out that ever greater populations and numbers of people involved in fisheries would logically eventually increase strain on the fish populations off the coast. Varied was their concern for this, with some saying that a fish stock collapse would be a problem for their great grandchildren and others believed they might see the effects in their own lifetimes. None of the respondents seemed urgently concerned over the matter as most of them seemed to have had getting by as their primary burden, by fishing for a living. The general sentiment was that; yes sustainability is an issue that concerns us, but providing for self and family takes priority.

4.3 Views on the development of fisheries in Hambantota district.

What was found from those interviewed was that most fishing vessels returned with less total catch. This can either be due to a reduction to fish stocks or because there are more involved in fishing today than in the past. Many of the respondents believed that the reduced catch size was indeed due to the increased number people becoming involved in fishing. They asserted that more boats in the water lead to less fish caught by each boat. In a way also, this has led to what they described as rises in the price of fish. Further,

respondents made clear that they often had to actively fish for longer shifts and in ever farther out waters to acquire a catch that would make the effort economically viable. These excursions requiring longer times at sea and greater distances travelled have required ever greater consumption of petrol, which in turn has driven up fish prices further.

Fewer fish per boat over the past years were cited by most respondents as having led fishermen to fish longer hours and farther from shore. While the number of fish that comes into the harbor is at levels higher than they've ever seen it comes from so many boats that what is contributed from the individual is far less than what it had been in the past. Essentially they suggested that while total catch per harbor was up, the catches of individual boats is down, possibly due to the increased number of participants in the fishery. Respondents made clear that this was a negative development in the fisheries of Hambantota. See figure 11 for composition of respondents' views on whether development of the fisheries has overall been positive.

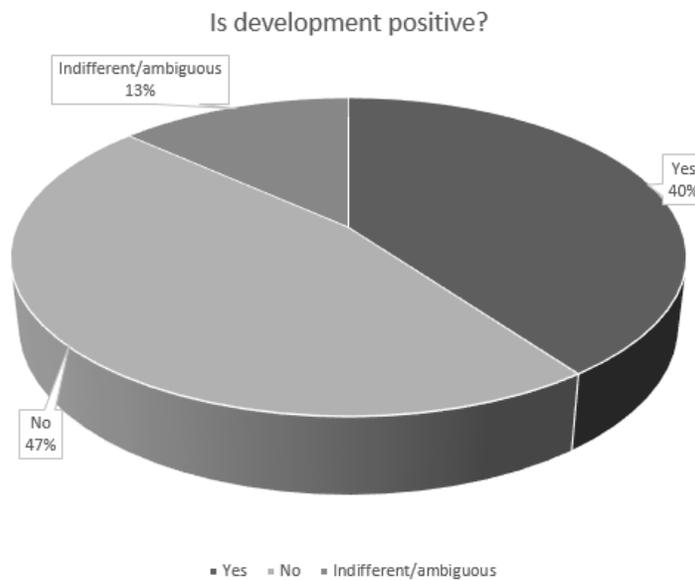


Figure 11. Respondents who believe development is either a good thing, or not, or indifferent.

Some respondents said that one could not fish well enough to make a living without a motorized vessel and modern fishing equipment. They mentioned that because of the motorization of so much of the industry it was hard to compete if one only had more traditional vessels and equipment at ones disposal. This inability to resort back to traditional and less capital-intensive methods of fishing due to motorized competition was described as an inflexible prerequisite to entering the fishery on one's own. The motorization of the fishery as a whole was seen by fishery respondents as propping up established boat owners and keeping the less established from initiating their own fishing ventures. Boat owners and

wholesalers saw it otherwise. They believed they were providing jobs and access to markets the fishermen wouldn't have had acting on their own. They did however agree that non-motorized crafts were taking ever less space in Hambantota fisheries, and that it would not be wise to invest heavily in fishing ventures that utilized these vessels alone.

Respondents were all of the same opinion that wages had risen over the past years, and that they had not kept pace with inflation. Most of them blamed rising petrol prices for this. They saw this as a very troubling development if it continues to worsen.



Figure 12. (Hambantota (town) Harbor. This shows Hambantota harbor from the market where much of the fish is often sold. Photo taken by author)

4.4 Notions of successful and failed developments in Hambantota fisheries.

Again the advent of modern fishing technology has led to great leaps in the efficiency and ease with which one could make a living as a fisherman according to many of the respondents. With modern technology accessing areas further away is not a big thing. With the advent of sonar and other types of communications technologies the job became even easier. The problem here for many of the fisher folk is

the extensive proliferation of these technologies. They are no longer what give you an edge in the market, but rather the standard of which you must possess to be able to compete at all.

A few respondents asserted that money poured into Sri Lanka following the tsunami of 2004. Much of this went to the fisheries and those who relied on fishing as a resource. They said that the money did not always go to those who needed it the most and that in a way it made those who had weathered the tsunami able to increase their own fishing capacity. These people, according to the respondents were those they had come to often worked for.



Figure 13. Large modern motorized boats anchored in Tangalle (Photo taken by researcher, March 2012 in Hambantota District)

The success of many of these fishing vessels has led to the overall growth of the fisheries, with room for ever more boats, employees and technologies entering the fisheries. All respondents, young and old, felt that the number of people fishing had risen dramatically over the past years and decades. Some felt this was a success while others were unsure, especially when interviews steered more towards ideas of sustainability and the protection of ecosystems.

A majority of respondents were saddened that the possibility of profitably using traditional crafts for fishing has begun to wither away. They felt this trend of increasing domination of larger vessels was becoming too rigid and did not allow for the common man to take his trade into his own hands. They felt that the way the fisheries had developed had somehow disenfranchised them as individuals of their right to

make a living from the common maritime aquatic fish resources. Development of the fishery has been to many of the respondents a double-edged sword with increasing employment opportunities yet fewer venues through which to be entrepreneurial.



Figure 14. Pictured are four more traditional non-motorized crafts on a beach in Hambantota. (Photo taken by researcher, March 2012 in Hambantota District)

Almost all of the respondents commented that they felt that fishing laws that were in place were seldom abided by. They accounted that suddenly certain kinds of trawling nets had been made illegal to curb damage on aquatic ecosystem resources. Most of them went on further to suggest in varying ways that most of these laws were commonly ignored. There were a number of respondents that said that when and if government fisheries authorities ever gave out any resources within the fishery it was most commonly mired in cronyism, with the resources often never reaching the hands of those needing it the most. They pointed out that this is partially the cause of the lack of trust towards authorities leading those in the fishery to choose to disregard many government regulations of the fishery.

4.5 Views on whether the Hambantota fisheries overall can provide for the future sustainable livelihoods of those involved in fisheries.

The rising cost of petrol was cited by almost all of the respondents as a hot issue. Rises in petrol costs have effects on the entire Sri Lankan economy. While the researcher was in Sri Lanka the cost of petrol had jumped and thus bus ticket prices followed suit. This was a hard blow for people who relied on the busses for commuting to and from work as well as for other reasons. The researcher became aware of the acute collective attention to petrol prices in both the interviews with respondents as well as in casual conversation with local acquaintances. Respondents from the fisheries were worried that the rise in petrol costs would somehow translate into a reduction of their wages. Further, they argued that every time fuel prices rose, eventually the prices of products like food also went up. This was especially troubling to them as most cited that wages were already not rising in tandem with inflation. Essentially, they feared that rises in fuel costs would inevitably lead to deeper personal financial strains.

The wages not keeping pace with inflation was cited as an issue among almost all of the respondents. This was not a single abrupt occurrence but rather felt in smaller bursts, like when fuel prices suddenly rise. While inflation is in many ways a natural occurrence the pace at which the respondents perceive it to be taking place has caused widespread concern for the future, not only of those involved in fisheries but for the rest of the country as well. Generally this concern has prompted many respondents to believe they will eventually work more to make a living.

Many respondents said that in addition to their full-time jobs in the fisheries they had become involved in income-generating activities both within and outside the fishery. The nature of many of these activities in addition to full time employment within the fishery included extended working hours in current position, additional equivalent employment with another employer, related employment (maintenance/handiwork) for same or other employer as well as employment outside of the fishery altogether. While there were many of the respondents who took on additional employment because they needed the money to support their families there were also several who did so because they could. Some respondents claimed that the diversification of their employment allowed them to better handle the risk of not finding employment over a given period. Fishermen might be working for a boat owner for a given period and when the job is done it is not certain that they will get to work for the same boat owner the next time his boat will go out to sea. Having the extra income helps the fisherman to financially segue between larger fishing employments. The problem for some of the respondents with exterior jobs however, is that if they see themselves resorting to more and more work outside the fishery because there is greater economic incentive it could

be good indication that the fishery might not be an industry that can adequately provide for the livelihoods of those involved.

Although there was not a unanimous consensus among respondents on whether and to what extent the future of fish stock off the coast of Hambantota was under threat from the fisheries, there were many who were worried. They asserted that because of the financial burdens placed on the common fisherman, boat owner and others involved in the fisheries, as well as substantial disregard for many regulations and restriction aimed at fishing practices, may be setting the stage for a deterioration of fisheries to provide. Many of the respondents seemed to think that the use of highly destructive and indiscriminate illegal nets were a great way to catch the most amount of biomass in a short time, while also causing substantial ecosystem destruction. There were many of the respondents that had reported both/either using these types of illegal nets and/or having seen many others who used them. This deviant and illegal activity is seen by the researcher as a classic example of a tragedy of the commons.

The ability of the fishery to provide jobs with living wages and affordable fish to the market depends on both the availability of fish and the efficiency of the fishery to turn a profit while ensuring that natural aquatic resources continue to regenerate to feed future demand. With the many factors involved in this many of the respondents were unable to say for certain that the fishery could, over the long haul provide food and jobs or sustainability.

Chapter 5: Analysis

The analysis section will provide analysis of the empirical findings in light of the theoretical frameworks and within a structure based on the relevant information presented in the literature review.

Coastal Zone Management

There is a vast array of people who are directly and indirectly involved and reliant on the coastal fisheries of Hambantota District. A well-managed fishery reconciles the needs of those involved in a sustainable balance with the health of the ecosystem from where they pull out resources. Rarely will coastal zone management be able to make all parties involved completely content, but the ideal means for reaching a balance is indeed a goal to strive for. The fieldwork gave little indication to the researcher that there was contentment among many or most of the fishermen interviewed. Whether or not their views and interests

had been represented in any wider coastal management efforts were completely unknown to most fishermen folk that were interviewed, and many felt that this had made them feel disenfranchised. This also means that whatever structure of coastal zone management that is in place lacks the engagement of those at the lowest levels.

The general absence of government regulation, as well as lack of general involvement in and around harbors makes it seem as though fishing is indeed lawless in regards to fishing methods off the coast of Hambantota district. While there are plenty of people involved in the extraction of fish from offshore ecosystems which have needs that are more easily heard, there are fewer voicing the needs of, and promoting the conservation of the general ecological health of fish stocks. Good coastal management considers the needs of all people and resources involved and strikes more lasting compromised balances between all those needs. From discussions with the respondents it seems that such management is not obviously in place.

As there were many respondents that reported not to notice any involvement of the government in the regulation and management of the fisheries it is therefore justifiable to assume that what management within the fishery that does occur is mostly market-regulated. While this may be an aggregately cost-effective way of managing a number of industries, in the case of natural-resource based industries such as fisheries, it seems to leave the door open to the overexploitation of ecological resources and in many ways a sort of ‘tragedy of the commons’ scenario.

Environmental Conservation

With the absence of practical enforcement of restrictions for the sake of conservation it is not obvious that the way fishing takes place off the shores of Hambantota is in any way taking place in a manner that safeguards the health of the marine ecosystems. With most respondents asserting that they do not notice any pressure to restrain or limit their actions at sea it is hard to say whether conservation efforts off the shores in Hambantota are at all substantial and coordinated in their efforts to control the fishing efforts towards a healthy level of resource extraction. Further many respondents claiming that either they themselves or others unscrupulously use methods of fishing that they know are both/either destructive or illegal.

The economic wherewithal of most of the respondents did not show that they had the means to prioritize much more than their own short-term financial gains in order to provide for themselves and their families.

There seemed to be an understanding among respondents that environmental conservation efforts often could come at the short-term expense of the individual fisherman's ability to generate value in the form of unbridled fishing effort returns. In their eyes, conservation efforts were expensive.

While this research has focused on the perspectives of our own species as the main source of data at the expense of more, and very important, biological information, it is vital to have human perspectives on board in the quest for effective conservation efforts as stated by Norse and Crowder (2005:32).

Information from the respondents showed that conservation efforts were far down the list of themes present in their collective short term list of priorities. Without the integrated and involved widespread awareness and willingness in terms of conservation it might seem that conservation efforts are non-existent among the fisher folk of Hambantota district.

Along with what the respondents has asserted in terms of increased efforts to catch the same biomass of fish along with the ever larger fishing capacity of the fishery as a whole this has led the researcher to not eliminate that there is a possibility that the door might be more than just practically open to economic and even Malthusian over-fishing.

Sustainable Livelihoods

For a livelihood to be sustainable, as outlined by Scoones (in Rakodi 2002:18), it must be able to “cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resources base”. From the information obtained from the respondents it seems as though the ability of those working in the fishery were struggling to cope with effects of rising petrol costs as well as a continuing inflation with a sluggish following in wages.

While this struggling may certainly be the ‘coping with’ that Scoones referred to, it could also be seen as a clear sign of worsening ability to cope. However, it seemed expressed by most of the respondents that these issues were not all that acute or new. Respondents spoke of the situation being very difficult at times and that sometimes they were forced to take on loans merely to put food on the table, essentially coping. Further, that many of the respondents had taken up extra work both inside and outside of the fishery shows that they are to some degree aware of the benefits that diversification of income generation provides. In particular when it comes to coping with shocks and stresses.

When it comes to resource base maintenance, however, there did not seem to be much information from respondents directed at their general contribution on that issue. There was the understanding that were the ecosystem resource base on which they rely to falter they would face a much larger shock than what income diversification within the fishery might be able to mitigate. In short the responses of the respondents seem to point to their virtual complete dependence on the fish resources for their livelihoods.

Sustainable Development

To reiterate Brundtland, sustainable development is the ability to provide for today's needs while not limiting future generations of the ability to provide for their future needs (1987: point 27). From the data collected from the respondents it seems that the fisheries of Hambantota district do not seem all that geared towards a comprehensively sustainable manifestation of development, at least not in the opinions of the respondents.

With the increasing number of boats and fishermen entering the market and the dwindling fish-per-boat ratio illustrated by many of the respondents it is clear that the pressure being placed on the marine fish resources off the coast of Hambantota district is rising. To what extent or rate this rise in pressure has on the fish stock is unclear, but that it is on the rise is safe to say. Also unclear to the researcher is the upper threshold of the ability of the aquatic resources to handle such pressure. What can be deduced from the respondents is that this pressure is on the rise and that it may eventually become more than what the fish resources can bare.

The environmental Kuznets curve gives hope to those sacrificing the environment on the short term in the name of longer-term prosperity as it stipulates that higher incomes (from developing) leads to lower levels of environmental degradation. Since most of the respondents made clear that their incomes were not matching the rise in inflation, one cannot say that the fishery in Hambantota, at least from the perspectives of the respondents, is riding the environmental Kuznets curve towards a stabilized level of development. In order for there to be any kind of widespread level of recognition and action towards the sustainable level of development of the fishery those involved first need to feel secure that fishing less than maximum is the smarter choice. Since there was no indication that the respondents showed any restraint on their individual fishing endeavours besides some following the law, it seems that Hambantota fisheries could very well be on a path towards over-fishing and exploitation of the fish stocks with no positive end in sight. Based on the general responses of respondents the development of Hambantota fisheries does not seem altogether sustainable.

Chapter 6: Conclusion

The following section will round off the thesis with concluding remarks and will further make some suggestions for how things in Hambantota district fisheries might be improved.

6.1 Conclusions

Overall it does not seem all that clear that the fisheries of Hambantota district are moving in the direction of sustainability. The respondents' recollections often suggest that the fishery is becoming increasingly less sustainable. It seems that the growing demand for, and rising prices of fish, seems to be motivating those involved in the fisheries to push for increasingly larger catches. While increasing catches may not necessarily be a bad thing in itself, the absence of the importance of conservation in the collective mind of those involved seems to suggest that conservation is far from a top priority. This de-prioritization can explain why many feel that they can/should use illegal fishing tactics deemed environmentally unfriendly (some types of nets) by authorities. Also it is attracting ever more people to join the fishery and the seeming absence of enforcement of fishing regulations appears to give many the feeling that fishing in illegal ways has no real consequences besides more profit.

The financial pressure on those working in the fisheries drives them to fish ever more. With low incomes rising being eclipsed by inflation it is becoming harder and harder for them to make a living wage by doing a lesser amount of fishing. The disincentive of fishing less does not seem to exist and there seems to be less and less fish per boat as the number of boats has been said to have increased substantially.

This has the potential to leave the door open for the destruction of the marine aquatic resource base of Hambantota district in the future. Given the nutritional importance fish plays in the diet of many Sri Lankans it is very important that this fish resource be conserved so that it may provide for future generations. The descent into a tragedy of the commons-type situation may not be unlikely if the fisheries do not realize the potential dangers of over-fishing and take appropriate actions to prevent or control it.

6.2 Recommendations

Given these trends it seems clear to the researcher that what could be needed the most to better promote the sustainability of the Hambantota fisheries would be both a carrot and a stick. For the carrot, greater awareness of the fragility of natural marine aquatic resources would provide the desire of more and more of those involved in fishing to actually want to contribute to the sustainable development of the fishery. And for the stick, better enforcement of fishing rules and regulation set out by authorities would also provide a disincentive to those considering the use of environmentally damaging fishing practices. Further the government and/or fishery organizations should take measures to alleviate the financial pressures placed on the fisheries that come from both rising petrol costs and the sluggish pace that wages seem to lag behind inflation.

List of references

- ASA (2008). Code of Ethics: and Policies and Procedures of the ASA Committee on Professional Ethics. American Sociological Association. Accessed 19.5.13 [from: <http://www.asanet.org/images/asa/docs/pdf/CodeofEthics.pdf>]
- Brown, K. Tompkins E. and Adger, N. (2002) Making Waves: Integrating Coastal Conservation and development. London, Earthscan Publications limited.
- Brundtland, G. H. (1987). Report of the World Commission on Environment and Development: Our Common Future. UN Documents: Gathering a body of Global Agreements. United Nations. Accessed 15.10.2012 [from: www.un-documents.net/ocf-ov.htm#I]
- Bryman, Alan (2008). Social Research Methods. 3rd Ed. Oxford: Oxford University Press.
- Christie, P. and White, A.T. (1997). Trends in development of coastal area management in tropical countries: From central to community orientation. Coastal Management Vol. 25, No. 2, Pp. 155-181. Accessed 03.05.2012 [from: <http://dx.doi.org/10.1080/08920759709362316>]
- CIA (2013). The world Factbook: South Asia: Sri Lanka. Accessed 13.02.2013 [from: <https://www.cia.gov/library/publications/the-world-factbook/geos/ce.html>].
- Clausen, R. (2008). Global biodiversity decline of marine and freshwater fish: A cross-national analysis of economic, demographic, and ecological influences. Social Science Research. Vol. 37, No. 4, Pp. 1310-1320.
- Deep South Sri Lanka (ND). Map of Hambantota District. Accessed 13.02.2013 [from: [http://www.deepsouth-srilanka.com/Images/Hambantota\(DistrictMap\).jpg](http://www.deepsouth-srilanka.com/Images/Hambantota(DistrictMap).jpg)]
- Deep South (ND). Hambantota: Hambantota. Accessed 18.4.13 [from: http://www.deepsouth.lk/?page_id=177]
- De Haan, L. and Zoomers A. (2005). Exploring the Frontier of Livelihoods Research. Development and Change. Vol. 36, No. 1, Pp. 27-47.

- Del Re, D. Gallocher, S. Peiris, N. Pomonis, A. Rossetto, T. Koo and R. Wilkinson S. M. (2007)
The Indian Ocean Tsunami of December 26, 2004: observations in Sri Lanka and
Thailand. *Natural Hazards* Vol. 42 No. 1 Pp.105-124.
- DFAR (2012) Fisheries Act. Department of Fisheries and Aquatic Resources, Sri Lanka.
Accessed 7.5.13 [from:
http://www.fisheriesdept.gov.lk/fisheries_beta/index.php/fisheries-act-and-amendments]
- De Silva, D.A.M. and Yamao, M (2007). Effects of the Tsunami on Fisheries and Coastal
Livelihood: a case study of tsunami-ravaged southern Sri Lanka. *Disasters*. Vol. 31, No.
4, Pp. 386-404.
- Dinda, Soumyananda. (2004). Environmental Kuznets Curve Hypothesis: A Survey. *Ecological
Economics*. Vol. 49, No. 4, Pp. 431-455.
- FAO (2005-2012). Fisheries and Aquaculture Topics. The sustainable livelihoods approach.
Topics Fact Sheets. Text by Benoit Horemans. In: FAO Fisheries and Aquaculture
Department. Rome. Updated 27.05.2005. [Accessed 27.11.2012] from:
<http://fao.org/fishery/topic/14837/en>
- FAO (2013). Fishery and Aquaculture Country profiles. Sri Lanka. Fishery and Aquaculture
Country profiles. In: FAO Fisheries and Aquaculture department [online]. Rome. Updated
5 Aug 2004. Accessed 5.5.13 [from: http://www.fao.org/fishery/countrysector/FI-CP_LK/en].
- Google (2013:A) Map of Tangalle divisional secretariat. Google 2013. Accessed 27.4.13 [from:
<http://www.citypopulation.de/php/srilanka-admin.php>]
- Google (2013:B) Map of Hambantota divisional secretariat. Google 2013. Accessed 27.4.13
[from: <http://www.citypopulation.de/php/srilanka-admin.php>]
- Gray, J. (1997). Marine Biodiversity: Patterns, Threats and Conservation Needs. *Biodiversity and
Conservation*. Vol. 6, No. 1, Pp. 153-175.
- Gunawardena, A. and Wickramasinghe, K. (2010). Was Tsunami Aid Well Targeted? An
Examination of Disaster Assistance in Sri Lanka. Policy Brief. No. 50-100. Accessed
03.05.2012 [from: http://sandeeonline.org/publication_search.php]

- Hambantota District Secretariat (2011). Overview. Ministry of Public Administration & Home Affairs. Accessed 13.02.2013. [from: http://www.hambantota.dist.gov.lk/index.php?option=com_content&view=article&id=4&Itemid=63&lang=en]
- Hutchings, J. A. and Myers R. A. (1994). What Can Be Learned from the Collapse of a Renewable Resource? Atlantic Cod, *Gadus morhua*, of Newfoundland and Labrador. Canadian Journal of Fisheries and Aquatic Sciences. Vol. 51, No. 9, Pp. 2126-2146.
- NA 2001. Number and percentage of population by district and sector. Census of population and Housing 2001. Department of Census and Statistics – Sri Lanka. Accessed 02.03.2003 [from: http://www.statistics.gov.lk/PopHouSat/Pop_Chra.asp]
- Norse, A. Crowder, L. (2005) Marine Conservation Biology: The Science of maintaining the Sea's Biodiversity. Washington D.C., Island Press.
- Pauly, D. Silvestre, G. Smith, I.R. (1989). On Development, Fisheries and Dynamite: A Breif Review of Tropical Fisheries Management. Natural Resource Modeling. Vol. 3, No. 3, Pp. 307-329.
- Pauly, D. (1997) Small scale Fisheries in the Tropics: Marginality, Marginalization, and Some Implications for Fisheries Management. Pp. 40-49. In: Pikitch, D.D. Huppert and M.P. Sissenwine (eds.) Global Trends: Fisheries Management. American Fisheries Society Synopsium 20, Bethesda Maryland.
- Pauly, D. Silvestre, G. (1997) Management of Tropical Coastal Fisheries in Asia: An overview of Key Challenges and Opportunities. Status and Management of Tropical Coastal Fisheries in Asia. ICLARM Conference Proceedings 53.
- Pauly, Daniel. Christensen, V. Guenette, S. Tony, J. Pitcher, U. Sumaila, R. Walters C, J. Watson, R. and Zeller D. (2002) Towards Sustainability in World Fisheries. Nature. Vol. 418, Pp. 689-695.
- Samarayanke, R. A. D. B. (2003) Review of National Fisheries Situation in Sri Lanka. Coast and Conservation Department, New Secretariat Maligawatta, Colombo. In: Assessment, Management and Future Directions of Coastal Fisheries in Asian Countries. WorldFish Center Conference Proceedings 67. Pp. 987-1012.
- Rakodi, Carole (2002) Urban Livelihoods: A people-centred approach to reducing poverty. Earthscan Publications Ltd.

- Sorensen, J. (1997) National and International efforts at integrated coastal management: Definitions, achievements, and lessons. Coastal Management. Vol. 25, No. 1 Pp. 3-41.
- Tisdell, C. (2001). Globalization and Sustainability: Environmental Kuznets Curve and the WTO. Ecological Economics Vol. 39, Pp.185-196.
- Venkatachalam, A.J. Price, A.R.G. Chandrasekara, S. and Sellamuttu S.S. (2010). Changes in frigate tuna populations on the south coast of Sri Lanka: evidence of the shifting baseline syndrome from analysis of fisher observation. Aquatic Conservation: Marine and Freshwater Ecosystems. No. 20, Pp. 167-176.
- World Bank (2013). Tsunami in Sri Lanka – Data Sheet. Accessed 14.02.2013 [from: <http://go.worldbank.org/PG6ZG5A1L0>]
- Yandle, B. Vijayaraghavan, M. and Bhattarai M. (2002). The Environmental Kuznets Curve: A Primer. PERC research study 02-1. Property and Environmental Research Center. Accessed 23.10.12 [from: <http://www.perc.org/articles/article688.php>]

Appendices

Appendix 1

Data table and Calculations

Interviewee #	Age Y/M/E	Gender M/F	Occupation M/F/B/W	Location H/T	Sustainability an issue? Y/N/I	Development moving in the right direction? Y/N/I
1	E	M	M	H	N	Y
2	E	M	M	H	N	Y
3	E	M	M	H	Y	Y
4	E	M	M	H	N	Y
5	E	M	M	H	N	Y
6	E	M	M	H	N	Y
7	M	M	F	H	Y	Y
8	E	M	M	H	Y	Y
9	M	M	M	H	Y	Y
10	M	M	B	T	Y	N
11	M	M	F	H	Y	I
12	M	M	F	H	Y	I
13	E	M	F	H	Y	I
14	E	M	F	H	Y	I
15	M	M	F	H	Y	N
16	Y	M	F	H	Y	N
17	M	M	F	H	Y	N
18	M	M	F	H	Y	N
19	E	M	W	H	Y	Y
20	M	M	W	H	Y	Y
21	M	M	F	T	Y	N
22	E	M	F	T	Y	N
23	Y	M	F	T	Y	N
24	M	M	F	T	Y	N
25	M	M	F	T	Y	N
26	E	M	B	T	N	Y
27	M	M	F	T	Y	N
28	M	M	F	T	Y	N
29	M	M	F	T	Y	N
30	M	M	F	T	Y	N

Age: Y=25 or younger / M=26-45 / E=46 or older

→(Y=2 M=16 E=12)

→(Y=6.7% M= 53% E=40%)

Gender: M=Male / F= Female

→(M=30 F=0)

→ (M=100% F=0%)

Occupation: F= Fisherman / M= Maintenance / B= Boat Owner-Manager / W= Wholesaler

→ (F=18/30 M=8/30 B=2/30 W= 2/30)

→(F=60% M=27% B=6.7% W= 6.7%)

Location: H=Hambantota Harbor / T=Tangalle Harbor

→(H=19 T=11)

→(H=63% T=37%)

Sustainability an Issue: Y=yes / N=No / I=Indifferent or Ambiguous

→(Y=24 N= 6)

→(Y= 80% N=20%)

Development moving in the right direction: Y=yes / N=No / I=Indifferent or Ambiguous

→(Y=12 N=14 I=4)

→(Y=40% N=47% I=13%)

Appendix 2

Interview Guide

Interview Guide #:

Interviewee trait:

Date:

Time:

Location:

1. General Information

1.1 -Gender:

1.2 -Age:

1.3 -Ethnicity:

1.4 -Religious orientation:

1.5 -Marital status:

1.6 -Domicile location:

1.7 -Highest level of education obtained.

1.7.1 - age at which highest level of education completed?

1.7.2 – any additional education, vocational etc...?

2. Workplace Information

2.1 -Primary workplace (full/part time?):

2.2 -Secondary workplace (full/part time?):

2.3 -How long occupied in these professions? Where before?

2.4 -How far from your workplaces do you live?

3. Household Information

3.1 -Number of family members living in same domicile:

3.2 -Number of family members in the same domicile as yours also working in same workplaces:

3.3 -Are you the primary financial supporter of your family/domicile? (If not, who is?)

4. Fishery Information

4.1 -Are you an employee, a part of cooperation, or do you run your own business?

4.2 -Do you, your partners or employers own a fishing vessel/ or fishing equipment, or do you rent?

4.3 -What type of vessel do you mostly use?

-Inboard Multi-day craft (IMUL)

-Inboard Single day (IDAY)

-Outboard Engine Fiberglass Reinforced Plastic Boat (OFRP)

-Motorized Traditional Crafts (MTRB)

-Non-Motorized Traditional Craft (NTRB)

-Beach Seine Craft (NBSB)

-No vessel.

-Other.

4.4 -Describe any changes in income you may have had over the past decade in each of your occupations, with a specific focus on before and after the tsunami.

4.5 -How many hours of your day and days of your week go to fishing (and related fishing work) now compared to before the tsunami?

4.6 -How would you describe daily catches before and since the tsunami?

-bigger/smaller fish?

-more/less fish?

-more/less undesirable fish/by catch?

4.7 -How would you describe daily catches before and since you started as a fisher?

-bigger/smaller fish?

-more/less fish?

- more/less undesirable fish/by catch?
- 4.8 -Do you notice a difference in fish prices before and since the tsunami?
- 4.9 -Are there more or less fishers to compete with in and around your fishing area before or since the tsunami?
 - Since you started as a fisher?
 - Since the Tsunami?
- 4.10 -Has your fishing equipment and techniques, as well as the equipment of other fishers advanced since you began as a fisher?
 - What about since the tsunami?
- 4.11 -Have you noticed whether there has been any change in catch quality and size due to advancements in fishing technologies and techniques?
- 4.12 -Do advances in fishing equipment and techniques give you or your competitors more of an advantage?
- 4.13 -What role do government fishing laws play in your daily workings as a fisher?
- 4.14 -The place from where you base your fishing, are there hierarchies in place that are advantageous or disadvantageous for you and others? Have these traits been the same since you started as a fisher, what about before and since the tsunami?
- 4.15 -Are there older generations of fishers in your family? What do they tell you about what fishing in Hambantota was like when they worked way back when?

5. Alternative livelihoods information

- 5.1 -Do you have other jobs within the fishing industry?
 - 5.1.1 -What exactly do you do?
 - 5.1.2 -Where in relation to your normal fishing job and home is it?
 - 5.1.3 -How long have you been doing it?
 - 5.1.4 -Did you do it before and/or after the tsunami?
 - 5.1.5 -What percentage of your income comes from this work?
 - 5.1.6 -What percentage of your working time is spent on this?
 - 5.1.7 -Why did you choose to engage in this type of work?
- 5.2 -Do you have other jobs outside the fishing industry?
 - 5.2.1 -What job?
 - 5.2.2 -Why this job?
 - 5.2.3 -Where, in relation to fishing job and home?
 - 5.2.4 -With whom?
 - 5.2.5 -Did you do it before and/or after the tsunami?
 - 5.2.6 -What percentage of your income comes from this work?
 - 5.2.7 -What percentage of your working time is spent on this?

6. Sustainable Development Information

- 6.1 -Do you see any positive or negative trends in the local fishing industry?
 - Explain... why, why not, how?
- 6.2 -To what degree has the fishing industry in Hambantota returned to how it was before the Tsunami?
- 6.3 -In what way have you contributed to the development of the fishing industry in Hambantota since the tsunami?
 - How so?
- 6.4 -What do you know about the term “sustainability”?
 - Do you feel it is, and/or has been adhered to before and after the tsunami by the Hambantota fishing industry in general?
 - How so, and who would be responsible for this adherence?