Master's Thesis

Beneath the Surface
Towards improved management of the scuba diving tourism system in Tofo, Mozambique

Joonas Kinni

Advisor:
Rodrigo Menafra

University of Akureyri
Faculty of Business and Science
University Centre of the Westfjords
Master of Resource Management: Coastal and Marine Management
Ísafjörður, April, 2016

Supervisory Committee

Advisor:
Rodrigo Menafra, MMM

External Reader:
Georgette Leah Burns Ph.D.

Program Director:
Dagný Arnarsdóttir, MSc

Joonas Kinni
Beneath the Surface: Towards improved management of the scuba diving tourism system in Tofo, Mozambique

30 ECTS thesis submitted in partial fulfillment of a Master of Resource Management degree in Coastal and Marine Management at the University Centre of the Westfjords, Suðurgata 12, 400 Ísafjörður, Iceland

Degree accredited by the University of Akureyri, Faculty of Business and Science, Borgir, 600 Akureyri, Iceland

.
Declaration

I hereby confirm that I am the sole author of this thesis and it is a product of my own academic research.

_____

Abstract

Natural resource management is essential in areas where livelihoods depend on them. Scuba diving tourism has become one of the fastest growing markets for special interest tourism in the world. Coral degradation and species disappearance poses a great risk for livelihoods in areas where SCUBA diving tourism is the main economic driver. Praia do Tofo emerged as a diving destination thanks to the year round presence of captivating marine mega fauna species: manta rays and whale sharks. Concerns have surfaced in recent years because of the degradation of the reefs around the popular dive sites and because the sightings of the mega fauna species has decreased radically.

In order to support the sustainability of the dive industry of Tofo a partial stakeholder analysis on the Scuba Diving Tourism System (SDTS) in Tofo was conducted. Nineteen individual in-depth interviews and two focus group meetings were conducted with selected key stakeholders of the scuba diving tourism system. Main findings are that the dive tourism industry is perceived as the key driver of Tofo's economy and the majority of livelihoods depend on it; that the main attraction for dive tourists is diving with the manta rays and whale sharks; that there is a desire for more opportunities for marine/environmental education for locals; that there is good relations between the stakeholders that allows for collaborative solutions to preserve the reefs.

Management suggestions include dive center micro management options to alleviate diving pressure on certain reefs, a proposal to resurrect the Divers Association of Mozambique in some form, and to continue the work done to implement a marine protected area in Tofo.

.

This thesis is dedicated to all those who fight on the light side.

- It is better to light a candle than curse the darkness -

Table of Contents

List of figures

List of Tables

Acronyms

AMAR	The Divers Association of Mozambique
DTI	Dive Tourism Industry
DTS	Dive Tourism System
MMF	Marine Megafauna Foundation
MPA	Marine Protected Area
NGO	Non Governmental Organization
PADI	Professional Association of Diving Instructors
SA	Stakeholder Analysis
SCUBA	Self Contained Underwater Breathing Apparatus
SDTI	Scuba Diving Tourism Industry
SDTS	Scuba Diving Tourism System

Acknowledgements

I would like to thank Jari and Satu Forsman who open-heartedly welcomed me to their dive center family in Tofo and showed unfaltering interest to my thesis topic even before they had ever met me. Your adventurous leap in life is an example that many others should follow.

A huge thank you goes to Narciso Nhampossa who helped me with the Portuguese translations and transcriptions after helping with the facilitation of the focus group meeting with the local dive staff. Without you this thesis would have been a lot harder to finish. I am proud to be able to call you a friend.

Thank you to my advisor Rodrigo, who always managed to bring be back down to earth when this thesis was about to get out of hand.

Big thank you to the University Centre of the Westfjords for opening my eyes to the wonderful world of coastal and marine management. I have finally found my calling in life. Thank you to the UW staff: Dagny, Kristen, Peter & Gunska for keeping us students informed and safe during the occasionally horrific weather in Ísafjör∂ur (and for the delicious treats).

Thank you to all my classmates of CMM 2014-2015. You are the most vibrant young minds that I have met in my life and the time we spent in Isa together will remain with me till the day I die.

Finally thank god the wonder of Internet without which I would never have figured out my data analysis!

1 Introduction

For centuries, people have had a strong fascination to personally go beneath the surface of the ocean. The historian Herodetus tells the story of Scyllis who lived around 500 BC. He was a Greek soldier who cut loose Persian war ships from their moorings using a hollow reed to breathe under water and thus stay unnoticed. This might be the first instance where a human used some sort of apparatus to breath underwater. The mystery and interest towards the underwater world has motivated people to develop constantly improving methods to stay submerged for longer periods of time and at ever-increasing depths. In 1943, Jacques Cousteau and Emily Gagnan created the first safe and reliable prototype equipment for breathing underwater (Dimmock, 2007). Their invention was called the Aqualung, a demand valve system supplying divers with compressed air to breath which made it possible for humans to stay underwater for longer periods of time than ever before, allowing them to start exploring the underwater world effectively for the first time (O'Neill et al., 2002). The Aqualung regulator profoundly altered the, hitherto equipment intensive diving practice. It had a simple, yet solid design and thanks to its low cost, was a desired piece of equipment for sport diving. It is thought that public demand for aqualungs and diving gear is greatly influenced by the National Geographic Magazines article about Cousteau's underwater archeology at Grand Congloué Island near Marseille.

Advances in technology have reduced the price of training and diving. This paired with globalization and the opportunity for people to travel easily around the world created a worldwide market for recreational SCUBA (self-contained underwater breathing apparatus) diving. Diver certification training started around the 1960's and now there are various recreational scuba diving certification agencies globally. Today, recreational scuba diving is a multimillion-dollar industry that has grown in popularity over the last 30 years, as is reflected in the growing number of certified divers (PADI, 2011). Scuba diving tourism has become one of the fastest growing markets for special interest tourism in the world (Bennet, 2003; Dignan, 1990). Most of the world's divers are recreational in nature and take part in guided tours to pre-explored dive sites. Dive locations are often established in the vicinity of suitable dive sites, such as wrecks, coral reefs or around specific marine life.

1.1 Importance of the SCUBA diving industry to local coastal communities and threats to the coral reefs

SCUBA diving activities have the potential to dramatically transform the economy of the area where they take place, such as in Hurghada, Egypt in the Red Sea, which transformed from a fishing village to a thriving diving related economy after diving activities started in the 1980's (Serour, 2004). Diving can become a driver for further infrastructure development and the economy of the location can strongly rely on the dive tourism industry (DTI) as dive tourists also spend money on supporting services such as accommodation and restaurants. In some places, many locals, who have been traditionally earning their livelihoods through agriculture or fishing, have suddenly new livelihood opportunities due to the emergence of the DTI. Coral reefs are an integral part of scuba diving. Coral reefs are important marine habitats that act, in addition to dive tourism opportunities, as nurseries for various fish species, which are consumed by humans for food, and provide ecosystem services like coastal protection and nutrient cycling (Moberg & Folke, 1999). Needless to say, certain DTIs rely heavily on the health of the coral reefs.

Recently, concerns have risen about the degradation of coral reefs by both natural and human factors. There is growing evidence of increasing anthropogenic threats through coastal land and marine pollution, climate change and ocean acidification, destructive human activities such as recreational boating, destructive fishing and scuba diving (Wilkinson, 2008). Scuba diving impacts on reefs are a result of diver-coral interactions, where divers come in contact with the reef and break it, disturb the sediment or influence the behavior of marine species (Barker & Roberts, 2004; Camp & Fraser, 2012). Fishing impacts can be described as direct or habitat destructive or indirect where the fish species abundance, biomass and mean size is reduced through successful fishing (Jennings & Polunin, 1996). Burke et al. (2004) state that coastal communities in the Caribbean are expected to experience considerable economic losses if coral reef degradation continues through loss of tourism revenues, loss of fishing livelihoods, coastal erosion and malnutrition due to lack of protein. Managing coral degradation is an important issue in areas where livelihoods are closely tied to the health of the coral reefs.

1.2 Problem definition

Sustainable use of reefs becomes increasingly important as coral reef health is falling worldwide (Carpenter et al., 2008; Wilkinson, 2008), and the pressure exerted by diving tourism is growing steadily. This situation calls for more sustainable solutions for dive tourism operations. Sustainable solutions should consider the impacts on natural ecosystems as well as impacts on livelihoods within the scuba diving destination. In order to create sustainable and collaborative solutions, knowledge of the marine ecosystem, pressures on this ecosystem and perceptions of local stakeholders and tourists are necessary.

Praia do Tofo (Tofo Beach) is an internationally upcoming diving destination that has embraced marine tourism in the form of SCUBA diving and ocean safaris (whale watching and swimming with whale sharks). Triggering the development of the dive industry was the healthy reefs and abundance of marine mega fauna species such as manta rays (*Manta birostis & Manta alfredi*) and whale sharks (*Rhincodon typus)* around the waters of Tofo. The coral reefs in Tofo have suffered degradation over the ten or so years that the scuba diving industry has been established. In addition, sightings of reef mantas and whale sharks have dropped drastically (Rohner et al., 2013). The degradation of the coral reefs at dive sites and the decrease in the sightings of mega fauna species over the past years has sparked a need for sustainable management solutions (Tibricá et al., 2011). Sustainable tourism management must be supported by all the stakeholders due to Tofo's small size and interdependence of the stakeholders in each other. As dive related tourism is the primary industry in Tofo, livelihoods are at risk along with the species that occupy the waters around Tofo.

1.3 Research questions

This thesis intends to assess the priorities, perspectives and values of chosen stakeholders that make up Tofo's scuba diving tourism system (SDTS), a framework proposed by Dimmock & Musa (2015). By listening to all stakeholders, this thesis aims to uncover sustainable tourism suggestions that convey the desires of the stakeholders in the SDTS in Tofo.

In terms of the economy, the importance of the DTI for the economy of Tofo and for the livelihoods of business owners and local people living in Tofo will be investigated. This will provide insight to the importance of healthy coral reefs. For example, if the DTI is very important to the economy of Tofo, then by definition, the healthy reefs are also important to the economy of Tofo. In terms of the environment, chosen stakeholders views on the use of the coral reefs in Tofo will be queried. This thesis looks to answer how the stakeholders perceive the value of the coral reefs and the mega fauna species to the economy of Tofo. By uncovering the stakeholders' priorities, perspectives and values on environmental protection, a better understanding of the possibilities for marine protection measures will be gained. The literature on the subject suggests using a participatory approach for conservation solutions. As a result, the stakeholders will also be asked what they would suggest to protect the reefs and the livelihoods of those associated with the dive tourism in Tofo.

With the above thoughts guiding this thesis the following research questions were formulated:

1. What are the perspectives, priorities and values of selected key stakeholders in the Scuba Diving Tourism System (as proposed by Dimmock & Musa, 2015) in Tofo, Mozambique regarding the use of coral reefs and the development of the dive tourism industry?

2. How important is the dive tourism industry for the local economy and livelihoods of the people in Tofo, as perceived by selected key stakeholders?

3. Based on the results of stakeholder interviews and focus group meetings, what kind of management measures can the stakeholders take in order to decrease negative impacts on the coral reefs and sustain the long-term dive industry in Tofo?

To answer these questions, a qualitative approach was undertaken which consisted of 19 semi-structured individual interviews and two focus group meetings with selected key stakeholders.

1.4 Organization and contents of the paper

Chapter 2 presents Mozambique and the case site, Praia do Tofo. It looks at the history, emergence of the dive tourism industry and defines the geographical boundaries for the thesis.

Chapter 3 reviews relevant literature and theory from the fields of dive tourism, stakeholder identification and stakeholder analysis. This literature review provides the rationale for the methods used in relation to the subject of the study.

Chapter 4 details and justifies the technical aspects of the methodology and describes the population sampled for interviews and focus group meetings. This chapter also explains the process in which the interview questions were developed and how the data analysis was organized. Further, this chapter discusses the particular limitations and ethical issues related to the methods used.

Chapter 5 presents the results. The first section presents the main emergent themes from the interviews. The second section provides a detailed account by theme and by stakeholder group, in accordance with the thematic framework fashioned in the data analysis stage.

Chapter 6 contains an analytical discussion of the results and presents the key findings of the study. The issues range from the importance of the dive tourism industry (DTI) to Tofo's economy, need for environmental education and the unheard voices of the local dive staff. This chapter also discusses particular limitations and strengths of the study. To conclude, this chapter provides specific management suggestions stemming from the analysis of the selected stakeholders within the SDTS of Tofo.

2 Background and Context

2.1 Mozambique

Mozambique (República de Moçambique) is situated in southeastern Africa, sharing a border with six other countries. Gaining independence after almost five centuries of Portuguese rule in 1975, the country was slow to develop resulting from large-scale emigration, economic dependence on South Africa, a drought and a civil war between The Ruling Front for the Liberation of Mozambique (FRELIMO) and opposition rebel Mozambique National Resistance (RENAMO) forces.

Mozambique's GDP composition by sector is agriculture: 28.6% industry: 21.2% and services: 50.2% (2014 est.) (cia.gov). Mozambique's economy has previously been focused on agriculture. Recently, growing industries include tourism, aluminum and petroleum production in the north of the country, food and beverages and chemical manufacturing, The main languages spoken are Portuguese 9% (official second language of 27%), Emakhuwa 26%, Xichangana 11%, Elomwe 8%, Cisena 7%, Echuwabo 6%, Other Mozambican languages 33%. English is generally spoken in more touristic areas.

Mountains in the west and high plateaus in the northwest silhouette Mozambique but the most common terrain is low laying coastland along the 2470km long coastline. Among other things, it is this coastline with many pristine beaches and islands that attract tourists to Mozambique. The number of international arrivals increased by 291% in Mozambique from 2002 – 2012 (Macro Economy Meter, 2012). In 2012 the steady increase of tourists dropped slightly due to a resurgence of the RENAMO forces (cia.gov) and the political situation at the moment can be classified as delicate. According to an economic impact assessment of the World Travel & Tourism Council (2015), the direct contribution of Travel & Tourism to GDP is expected to grow by 6.4% per annum to MZN28.0 billion (2.6% of GDP) by 2025. They also estimate that by 2025, Travel & Tourism will account for 358,000 jobs directly (compared to 268,000 in 2015), an increase of 2.9% per annum over the next ten years.

2.2 The scuba diving tourism system in Praia do Tofo

Praia do Tofo is a small village situated in the Inhambane province of Mozambique around 500km from the capital Maputo (Figure 2.1). The surrounding coastline is characterized by large sand dunes and long stretches of sandy beach with occasional rocky shores. Once a fishing village, this picturesque coastal town has turned into a dive tourism destination and has started to receive an ever-increasing numbers of tourists every year. This is both due to the general increase in the number of international arrivals in Mozambique from 2002 – 2012 and the emergence of the DTI, which is slowly being recognized among diving circles around the world. The popularity of Tofo as a world-class diving destination is in response to an abundance of rocky reefs that support up to 30 species of soft corals and 70 species of hard corals (Obura et al., 2012). These corals support plenty of marine organisms surrounding the many dive reefs near Tofo. But what really makes Tofo a diving hot spot is the array of marine mega fauna species found in the area including manta rays, humpback whales and whale sharks, which are used for marketing Tofo internationally and are a must see on a divers checklist.
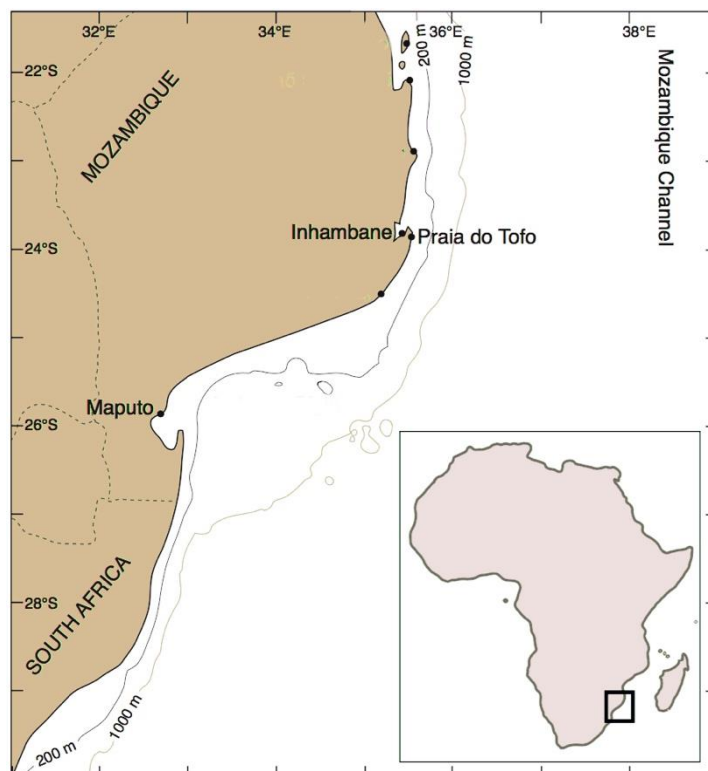
Figure 2.1 Geographical location of Tofo in Africa

The amount of tourists visiting Tofo at any time in the year allows for the classification of low and high seasons. The high seasons generally correspond with both South African and European holidays and fall around Easter, June – August, Mid December – Mid January. The other times of the year are generally accepted as being low season.

A survey on diver demographics in Tofo by Tibricá et al. (2011) found that most of the dive tourists wished to interact with the mega fauna and pointed this to be one of the main reasons they visit the area. Research by the Marine Megafauna Foundation (MMF) has shown a significant decrease in reef manta and whale shark numbers in the area between 2003 & 2011 (Rohner et al., 2013). This raises concerns on the future of dive tourism in Tofo as it relies on the mega fauna species and the coral reef health to bring in visitors. A slowdown of the dive industry would negatively impact the local community as Tofo's dive industry employs many locals in jobs like dive masters, boat captains, secretaries, chefs etc.

Marine resource management is a topic that needs immediate attention in order to maintain the health and appeal of Tofo's marine environment as highlighted in the extensive COAST (Collaborative Actions for Sustainable Tourism) report, published in 2014. This report discusses the reef and marine recreation management in the Tofo-Barra-Tofino area of Mozambique. It identifies relevant stakeholder groups, describes the current management situation and visualizes the overlapping marine recreation activities that cause problems such as degradation of coral reefs, disturbance of marine species, and conflicts between user groups. The report points out the lack of collaborative management of Tofo's dive sites between the 5 independently run dive operators of the area (after the report was published one dive center situated in nearby Barra has shut down). Moreover, the report states that the numbers of visitors to the dive sites are not controlled or managed properly. One outcome of uncontrolled diver numbers at the popular dive sites is the degradation of the sensitive reef ecosystems and disturbance of marine species (COAST, 2014).

The geographical boundaries of this study are described through the extent of the DTI's reach in the town of Tofo and the surrounding marine areas. Figure 2.2 is from the COAST report and shows the headland of Tofo-Barra-Tofino. This figure shows the dive

sites of Tofo, which lie in areas titled higher use zones. The scope of this thesis is only within the dive industry stakeholders in Tofo.
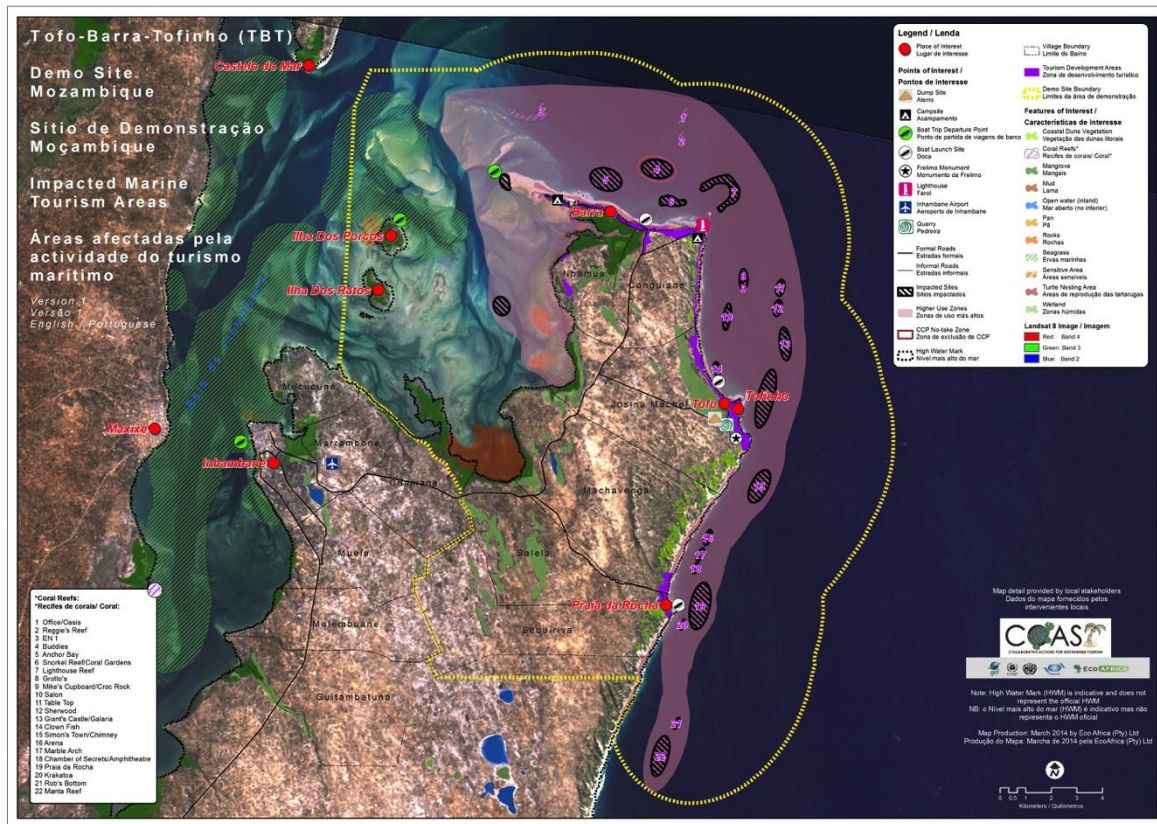
Figure 2.2 Study site and impacted marine tourism areas (COAST, 2014)

Figure 2.2 depicts the Inhambane peninsula in which Tofo lays on the ocean side and shows the impacted marine tourism areas. The marine areas used most for recreational purposes are marked with the purple color and are labeled as higher use zones. The dive sites are marked with the black and purple circles with numbers. There used to be a dive center in Barra (north end of the peninsula), but it closed down during the data gathering for this thesis after which the geographical scope of the thesis was limited to only include the stakeholders involved in the SDTS in Tofo.

3 Literature Review

The literature review will introduce dive research to date, the scuba diving tourism system (SDTS) framework, stakeholder identification and stakeholder analysis literature to build the theoretical foundation for this thesis.

3.1 Dive research to date

Scuba diving research is being undertaken in various locations around the world and across disciplines. Dimmock & Musa (2015) reviewed scuba diving publications and found some 16,000 publications with a focus on scuba diving. This research includes enquiries from diver impacts (e.g., Barker & Roberts, 2004; Zakai & Chadwick-Furman, 2002), human physiology (Straughan, 2012), health and safety (Wilks & Davis, 2000), diver motivation and satisfaction (Gill et al., 2015; Lucrezi et al., 2013) and the efficiency of marine protected areas (MPA) in decreasing diver impacts (Davis & Tisdell, 1995) just to mention a few. Diver impacts are defined as diver contact with reefs causing damage and disturbance of marine species. Areas with higher diver frequency have been found to suffer greater coral breakage and higher rates of tissue loss. Studies on decreasing diver impacts on reefs have identified buoyancy control and education as crucial to ensure safety and protection of the marine environments. Education is said to inform and influence diver actions and perceptions illustrated in responsible diving behavior. Various diver surveys have been utilized to understand diver satisfaction to improve service quality and marketing of dive resorts. From an environmental resource management point of view, decreasing coral and habitat destruction and protecting marine species have been best addressed through the creation of marine protected areas (MPAs).

According to Dimmock & Musa (2015), most dive research has concentrated on the scuba diving tourists and their individual impacts and satisfaction factors but has failed to include the broader scuba diving industry, including the host communities, related services or collaborative efforts towards sustainability. The authors state that less than 30 percent of

dive research studies include multiple stakeholders and their perspectives in a holistic way. However, in the past few years a few central studies have emerged that have understood the importance of stakeholders within the diving destination.

Wongthong & Harvey (2014) investigated possibilities for integrated coastal management (ICM) and sustainable tourism (ST) of the scuba diving industry in Koh Tao, Thailand. They used mixed methods: surveys and in-depth interviews, to reveal the local's perceptions of the development of the dive tourism industry and its impacts, and their recommendations towards a more sustainable way of managing the dive tourism. Their findings show that the sustainability of a tourism destination can be advanced or slowed down by the stakeholders who are part of the tourism activity and who all have several interests and who interact with one another with differing priorities and perspectives. The authors state that each tourism management location must develop appropriate strategies most suitable for the location in question, based on the interrelations of the stakeholders. They conclude by saying that there is no perfect management plan that can be implemented from one place to another due to the differences in the composition of the stakeholders within the separate tourism systems. Understanding the environmental and social components of the DTI through a holistic approach will aid decision making about management frameworks that best fit the local setting and move towards a more sustainable reef-based scuba dive tourism. One management suggestion that the authors put forth is the need for more integration between natural and social sciences and the stakeholders and the management of land-ocean.

Haddock-Frasier & Hampton (2012) studied the sustainability of dive tourism in Malaysia. They used semi-structured interviews (n=72) in two locations to find out whether the different stakeholders consider tourism a benefit or a cost to them in terms of economic/social/environmental indicators. The authors divided the stakeholders of the dive tourism system (DTS) into four groups and found that the stakeholders have varying perceptions on the sustainability of the dive tourism industry. The dive industry stakeholders raised environmental concerns that non-diving stakeholders did not prioritize who in turn supported growth and development and economic benefits created by the SDI activities.

Hillmer-Pegram (2014) studied the resilience of dive tourism in complex change and conducted a case study in the Virgin Islands, US. The author conducted in-depth semi-structured interviews (n=11) with dive operators and divided their analysis based on stressors and sources of resilience of the DTS illustrated in economic/social/environmental sections. Hilmer-Pegram found that lack of social and political support experienced by the dive operators in the Virgin Islands in the US hindered broader efforts of sustainability. Although this research was conducted in the US as opposed to a developing world location, it still emphasized the importance of stakeholder collaboration within a scuba diving tourism location.

Dimmock & Musa (2015) built on the above body of knowledge and identified the need for a scuba diving tourism system (SDTS) framework for collaborative management and sustainability. This framework, presented below in further details constitutes the theoretical basis for the approach undertaken in this thesis.

3.2 Scuba Diving Tourism System framework (Dimmock & Musa, 2015)

Dimmock & Musa (2015) propose a conceptual model of the Scuba Diving Tourism System (SDTS) by using a whole systems or holistic approach. According to them, a holistic approach contains multiple advantages: it can shed light on the relationships between stakeholders, reveal their respective priorities, perspectives and values and allows the stakeholders' individual wants and concerns to be included in the policymaking process. Further, Plummer & Fennel (2009) state that a holistic approach can also enable opportunities for sustainable management through collaboration and responsibility in managing shared social and environmental resources. Dimmock & Musa (2015) believe that this type of holistic approach has the potential to enable improved policy and management decisions towards a more sustainable future for the marine environment, the dive operators, the host communities and the dive tourists as any sustainable approaches require integrating social and environmental systems and the wants and concerns of the stakeholders within the SDTS.

The elements that make up the SDTS are: the marine environment, scuba divers, the scuba diving tourism industry (SDTI) and the host community (Figure 3.1).
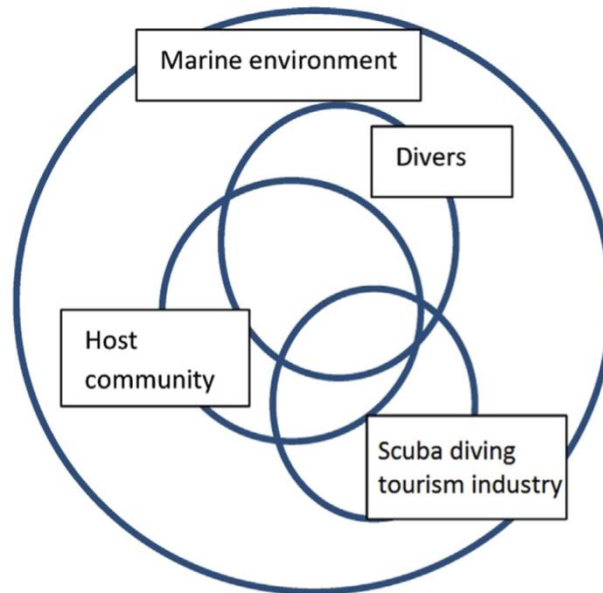
Figure 3.1 Key elements of the SDTS framework (Dimmock & Musa, 2015, p.53)

The marine environment encircles the SDTS as all other stakeholders in the system depend on it. Identified stakeholders are: the divers (tourists, dive center staff etc.), the scuba diving tourism industry (dive operators that provide scuba diving training, related services like accommodation, restaurants, transport and any others supplying for divers) and the host community (local people, local governmental bodies, policy makers and resource managers). Each stakeholder in the SDTS has their own roles and responsibilities but they also interact and are dependent on the other stakeholders for the system to work.

3.3 Stakeholder analysis as a tool in natural resource management

To successfully answer the research questions proposed in this thesis, a suitable approach for uncovering stakeholder perspectives priorities and values must be undertaken. Stakeholder Analysis (SA) was identified as a tool used for understanding a system by identifying key stakeholders and evaluating their respective interests in the system. SA aims to uncover efficient, fair and environmentally sustainable development strategies in a system with multiple interests and objectives.

Stakeholder analysis originates from business management, where the realization occurred that understanding the interests and influence of stakeholders could support or threaten business performance (Brugha & Varvasovsky, 2000). Stakeholder analysis was thus used to support the businesses strategy by helping to better cope with stakeholders. Approaches to stakeholder analysis have been adapted from business management to suit the needs in policy, development and natural resource management (Reed et al., 2009). There is an understanding that stakeholders could and should be part of environmental decision-making (Prell et al., 2009). SA has the possibility to avoid conflicts, represent diverse interests and enable minor stakeholders to influence decision-making (Reed et al., 2009; Prell et al., 2009). Stakeholder definitions usually build upon the pivotal work of Freeman (1984), who defines stakeholders as any group or individual who can affect or is affected by the achievement of the organization's objectives. The definition has been extended in environmental management literature to include any living or non-living entity that is affected by a decision or action (Reed et al., 2009).

Most SA literature follows more or less the same stages. The key stakeholders are identified, their respective interests are assessed, and the relationships between stakeholders are investigated. These steps are what Reed et al. (2009) refers to as *application of stakeholder methods*. To implement a SA for a specific system or location, the *context* must be identified i.e. identifying the focus and system boundaries. The usual outcome of a SA is to suggest *actions* or future activities and stakeholder engagement practices that emerge through the analysis phase. Reed et al. (2009) visualize the general process of stakeholder analysis in Figure 3.2.
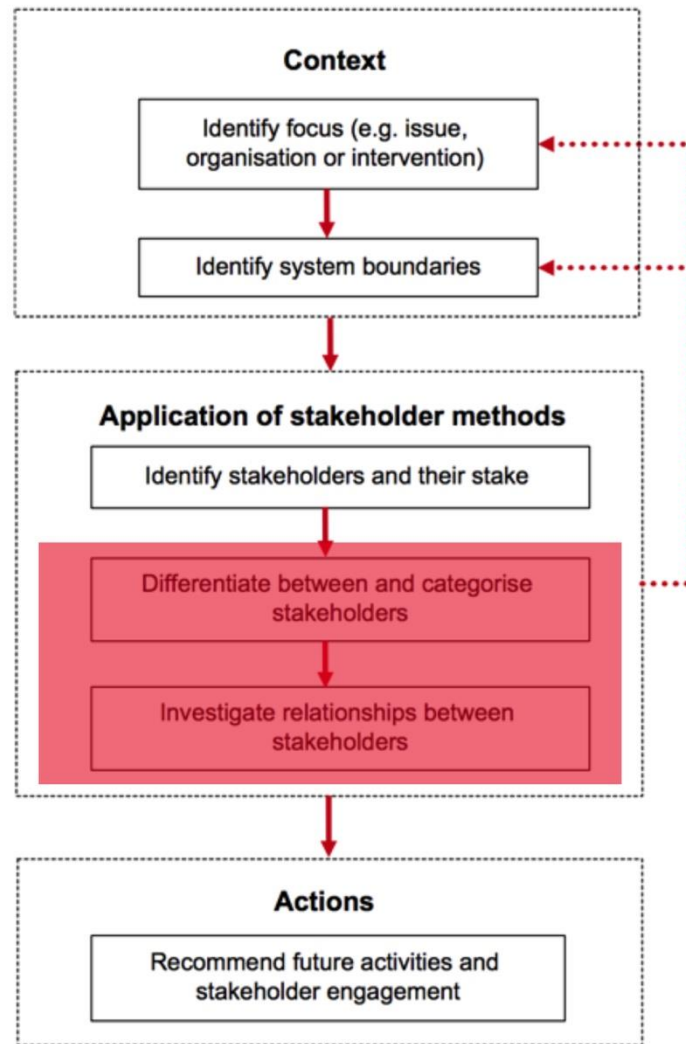
Figure 3.2 Representation of the steps of a stakeholder analysis (Reed et al., 2009, p.1947)

The first step is to determine the focus (i.e. issue) and system boundaries. The focus in this research is on the SDTS and related natural resources: the coral reefs and marine mega fauna species, which provide both intrinsic values to dive tourists and economic value to the fishermen as well as ecosystem services. The system boundaries are the extent of the DTI in Tofo as described in chapter 2.2.

For the *application of stakeholder methods*, the selected key stakeholders are identified in the next chapter (Chapter 3.4), the methods for assessing the stakeholders respective interests will be presented in the methodology chapter (Chapter 4) in terms of data gathering methods and the outcome of those methods are presented in the results (Chapter 5) and discussion chapters (Chapter 6). The last step of the partial SA: *actions,* which in

this thesis equates to management suggestions will be presented in the discussion and conclusion chapters (Chapter 6) of the thesis.

This thesis conducted a partial SA of the SDTS of Tofo. What was left out from a complete SA was identifying all stakeholders, differentiating between and categorizing stakeholders and investigating the relationships between them (marked with a red box in Figure 3.2).

3.4 Stakeholder identification for Tofo

Stakeholder identification is often mentioned as the most difficult and time consuming step in any stakeholder analysis. In this case, stakeholder identification was done based on the three seminal publications on dive tourism management (Dimmock & Musa, 2015; Haddock-Frasier & Hampton, 2010; Wongthong & Harvey, 2014) presented in the two preceding subchapters. By combining dive tourism stakeholder definitions from the aforementioned publications the stakeholders that make up the SDTS in Tofo are categorized into the groups found in Table 3.1.

Table 3.1 Identified stakeholders of the SDTS of Tofo

Stakeholders	Mentioned in literature
1. Dive instructors/masters	Haddock-Frasier & Hampton, 2010
2. Dive related businesses: dive center owners, dive boat crew and compressor/equipment specialists.	Haddock-Frasier & Hampton, 2010; Dimmock & Musa, 2015
3. Non-dive businesses, but catering to the dive tourists: Accommodation & Restaurants.	Dimmock & Musa, 2015
4. Dive tourists	Haddock-Frasier & Hampton, 2010; Dimmock & Musa, 2015
5. Host Community: Social and cultural resources and the government & conservation NGOs	Dimmock & Musa, 2015; Wongthong & Harvey, 2014; Haddock-Frasier & Hampton, 2010
6. The marine environment in which diving activities take place	Dimmock & Musa, 2015

This list cannot be defined as a complete stakeholder map for the SDTS of Tofo, but is better characterized as a representation of selected key stakeholders.
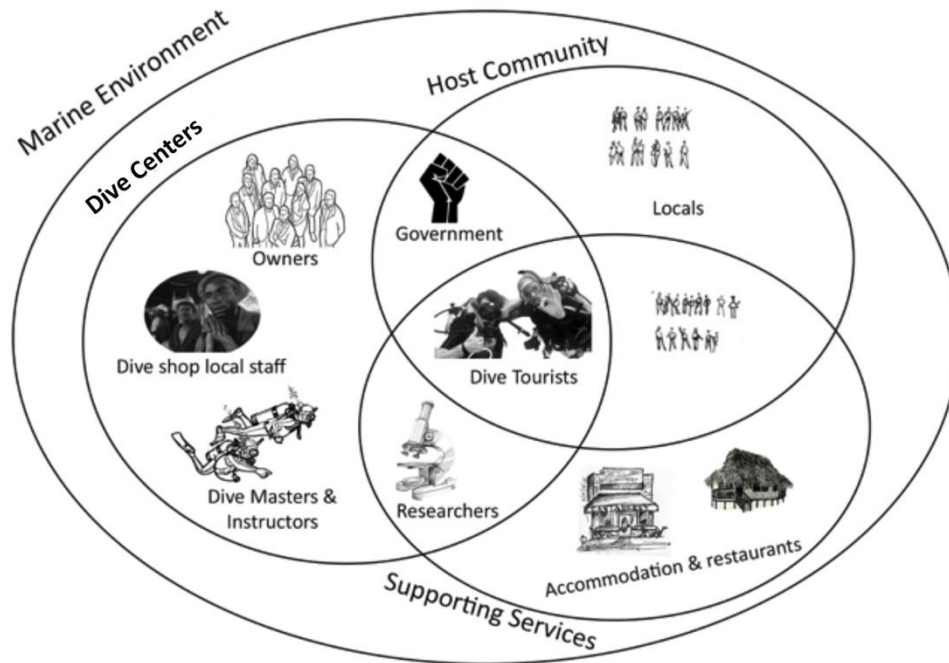
Figure 3.3 Illustration of the stakeholders of the SDTS in Tofo

The stakeholders that make up the SDTS in Tofo are illustrated above in Figure 2.2. The marine environment is the outer circle as it is the key element in the SDTS since all other stakeholders in the system depend on it. Then there are the DTI components, which enable the dive tourists to come to Tofo. There are four dive centers, which include the dive center owners, the dive center local staff (compressor boys, mechanics, captains etc.) and the dive instructors and dive masters. All of the dive centers offer similar services, including diving to the various reefs to catch a glimpse of a manta ray, and ocean safaris where the visitors have a chance to go snorkeling with whale sharks and dolphins. The dive tourism has spawned various supporting services including restaurants, accommodations and shops and there is also a locally run vegetable market in the center of town. The host community includes the local people and the governmental agencies that are responsible for maritime affairs. There are three marine conservation NGOs stationed in Tofo that conduct scientific research to support environmental decision-making. A recent example is when a crown-of-thorns-starfish (Acanthaster Planci) outbreak was discovered in one of the diving reefs, one

of the conservation NGOs devised an action plan to manage the outbreak and this plan was sent to the local maritime authorities for acceptance. The conservation NGOs also produce the ethical guidelines for mega fauna interactions and host educational lectures on manta rays, whale sharks and other species in Tofo that are open to the public.

4 Methodology

This thesis conducted a partial SA for the SDTS of Tofo. The key stakeholders investigated for this thesis were identified in chapter 3.4. The main bulk of data gathering for this thesis was conducted using semi-structured, in-depth interviews and focus group meetings. These two qualitative methods have been largely accepted methods in valuation research and have been known to expose the discourse and concepts that respondents use to conceptualize resource and environmental issues (Kaplowitz & Hoehn, 2001). The specifics of each method will be covered next. The process of formulation of the interview questions and the interview questions will also be presented. There is a justification of why some stakeholders were chosen for interviews and others for focus group meetings. Finally, this chapter presents limitations of the methodology and research ethics.

4.1 Stakeholder interviews and focus group meetings

The stakes of the chosen stakeholders were explored through investigating the perspectives priorities and values of the stakeholders as suggested by Dimmock & Musa (2015). The stakeholders were queried about natural resources and the development of the DTI in Tofo. This was done through semi-structured in depth interviews and focus group meetings.

The individual interviews lasted between 13 and 43 minutes and the total recorded interview times were 7 hours 42 minutes. The two focus group meetings produced 2 hours and 24 minutes of recordings. All the recordings turned out to be around 57,400 transcribed words.

Table 4.1 Breakdown of research participants

	Number of people	**Percentage**
Interview participants	19	56 %
Focus Group Participants	15	44 %
Total Number of respondents	**34**	100 %
Males	27	79 %
Females	7	21 %
Locals	16	47 %
Foreigners	18	53 %

Table 4.1 shows information about the research participants. In total there were 34 participants of whom 19 were interview respondents and 15 focus group meeting attendees. The two focus group meetings were for the dive masters and the local dive center staff and they had six and nine participants respectively. There were 27 male participants and seven female participants. Out of the participants 16 were Mozambicans and 18 were foreigners.

4.1.1 Interview methodology

Interviews have been used in natural resource, and dive management to uncover stakeholder values (e.g., Haddock-Frasier & Hampton, 2010; Reed et al., 2009). Interviews were seen as a convenient data gathering method for this thesis as only one person, the author, conducted the data gathering. This approach allowed better control of the line of questioning, and meant that only one individual retained all information regarding the interviews and could consistently address questions about the topics that the interviewees expressed. This can be considered an advantage because the author was constantly aware of the research objectives and research processes and could clarify any questions arising during the interviews.

Interviews, as a tool in stakeholder analysis, are not without critique of course. Some criticism of interviews is that it is time consuming, as the interviews need to be organized, conducted and transcribed.

The interviews were semi-structured, which means that although there is a predetermined list of questions to help the interviewer, the style of the interview is more conversation like allowing the interviewer to explore trajectories that may stray from the guide when he/she feels appropriate (Longhurst, 2003). This thesis investigated the priorities, perceptions and values of the stakeholders. MacDonald et al. (2013) state that values, by their very nature, are sensitive and subjective, and used in their study semi-structured interviews, which allow a more open-ended and exploratory approach to values than, for example, a questionnaire.

From each stakeholder category identified in Table 3.1, individuals were chosen for an interview. Table 4.2 breaks down the number of individuals that were interviewed by category.

Table 4.2 Total number of respondents interviewed per stakeholder group

Stakeholder Group	Interviews	Total number of interviews
1. Dive instructors/masters	1 x dive instructor / dive center	4
2. Dive related businesses: dive center owners	1 x owner / dive center	4
3. Non-dive businesses, but catering to the dive tourists: Accommodation, restaurants, transport.	2 x accommodation owner 1 x restaurant owner	3
4. Dive Tourists	1 x dive tourist / dive center	4
5. Host Community: Social and cultural resources and the government & conservation NGOs	3 x locals of different professions 1 x scientist from a conservation NGO	4
	Total Interviews	**19**

Initially, the number of planned interviews was 22 with one additional local and restaurant owner and one member of a governmental agency. However, due to difficulty in managing to organize a meeting with them, they were unable to be interviewed.

The primary sampling style was purposive sampling, meaning that the characteristics of chosen individuals need to be relevant to the study as well as representative of the population (Anderson, 2010). In addition, the individuals had to speak some level of English as the author did not speak any of the local languages and had limited resources for translation. Secondly, where necessary, convenience sampling (Anderson, 2010) was used. It was easier to organize interviews with participants who had more time and were willing to take part in the study.

For the dive instructors, dive center owners and dive tourists, the author wanted a representative from each of the four dive centers in Tofo. This was considered important so the dive centers felt that they were all considered equally in the study, but also because excluding a dive center could result in the study's findings and suggestions being biased. With these criteria, suitable candidates were chosen from each stakeholder group.

Dive Center Owners: As there are 4 dive centers, the owners were easily identified and there was no misconception about interviewing the correct people. Three of the dive centers have two owners that run the center together. In these cases only one individual from each center was interviewed based on their preference and time availability.

Dive Instructors: All dive centers in Tofo have one or more instructors working for them. However, only one instructor per shop was sought for interview. All instructors in Tofo are required to have English proficiency so that did not affect the interviewee selection process and it came down to time availability. Each dive center was approached and the topic of the research was introduced. The instructors in the dive center then decided among themselves who could be available for the interview.

Dive Tourists: One dive tourists per dive center was interviewed and they were chosen at random. On a chance day, a person who looked to be a diver in each dive center was approached. The study was introduced and the person was queried if they were a diver at

that dive center and if they had time to take part in an interview. If agreed, the interviews were then carried out in the dive centers' premises. The selected candidates were only interviewed if they had already been taking part in diving activities in Tofo.

Local People: Most local people have no troubles with time availability but do have problems with English language. The main local languages spoken in Tofo are Bitonga and Portuguese. As the author had no proficiency in either of those languages, the selection process for the local people came down to selecting participants that had at least an average English proficiency. The three participants in this stakeholder category also needed to be of different professions to get a broader sample of the perceptions and values of the local people. The professions of the chosen participants were a tailor, a fisherman, a local souvenir craftsman and a self-employed entrepreneur.

Accommodation and restaurant: There are various accommodation and restaurant options in Tofo. Two accommodations and one restaurant were chosen from this stakeholder group. The accommodations were chosen based on the availability of their owners or managers. Three accommodations were approached and one owner was not available for an interview leaving the remaining two of these accommodation representatives to be interviewed. Both accommodations are known to cater to dive tourists and the managers were readily available for an interview.

The restaurants were chosen based on English proficiency of the owner and availability of the owner. Four restaurants were approached, but only one agreed to take part in the interview.

Conservation NGOs: One paid employee from a conservation NGO was chosen for an interview based on time availability.

The interviews took place wherever was most suitable for the respondent (Figure 4.1) and began with the participant reading through and signing the consent of participation form (Appendix A) available in both English and Portuguese. E-mail addresses were an optional addition to this form so the transcribed text could be sent back to the interviewees for

review. All interviews were recorded using a mobile phone or a personal laptop and were transcribed after the interview.

Figure 4.1 Illustration of a one-on-one interview situation. Photo credit: Caspar Roxburgh

4.1.2 Focus group methodology

In addition to interviews, this thesis used focus groups as a qualitative data gathering method. Focus groups are a type of group interview between the researcher and the participants in order to generate data. The researcher does not only ask the participants to answer the questions individually, but encourages them to talk with each other and comment on each other's opinions and points of view (Kitzinger, 1994). It is thought that focus groups help participants explore and clarify their views more diversely than through one-on-one interviews (Kitzinger, 1995).

Kitzinger (1995) suggests that focus groups have potential sampling advantages such as:
- Do not discriminate against illiterate people.
- Can encourage participation in individuals who are intimidated by the formal setting and seclusion of a one on one interview and do not want to be

interviewed on their own.

- Can encourage contributions from respondents who feel they have nothing to contribute but take part in the conversation generated by the other group members.

Two stakeholder groups were chosen for focus group meetings: dive masters and local dive center staff. This meant that the participants in each focus group meeting were homogenous based on their profession or role within the SDTS. Many researchers recommend homogeneity in focus groups because it enables capitalization of peoples shared experiences (Kitzinger, 1995).

Most focus group literature suggests that group sizes be between 4-10 people as smaller groups show better potential and are easier to manage (Rabiee, 2004). The absolute minimum that this study required was one representative from each of the dive centers for both the dive master and local dive center staff focus group meetings. To counter the problem of non-attendees (people who do not show up at the appropriate date and time) participants were over recruited by 10-25%, which meant asking for one additional person from each dive center to attend the focus group meeting. In the two meetings that took place, the groups were six and nine people in size. This translates to at least one and a maximum of three participants from each dive center.

Appropriate candidates were approached multiple days in advance to confirm a suitable time and date for everyone. Both focus group meetings took place in the common room of one of the dive centers (Figure 4.2). The participants were introduced to the topic of the thesis and asked to sign a consent of participation and were assigned a number for identification in the analysis phase. Each time a question was asked, ample time was allowed for participants to do the talking. The only times the author took part in the discussion was to clarify questions, probe further to a topic that was discussed, to ask participants that were not so talkative about their opinions on the topic discussed or moving on with the next question once decided that the question was fully exhausted.

Figure 4.2 Image from the local dive center staff focus group meeting. Photo credit: Caspar Roxburgh

For the local dive center dive staff focus group meeting, a translator was hired on location to help with the facilitation of the focus group meeting. Although all of the participants in that focus group spoke a certain level of English, it was decided that it would be easier for them to fully express their opinions in their first language of Portuguese. The consent forms and interview questions used were translated to Portuguese with the help of the translator.

4.2 Justification of different methods for different stakeholder groups

Focus groups were chosen as a second data gathering method because of time constraints and optimizing on translator services. The individual interviews took a lot of effort: participants had to be tracked down, persuaded to take part in the research and a suitable time was agreed with them for the interview situation. Covering all participants within a single stakeholder group often stretched across a long time span even up to a month. Fearing that the field time allocated was not enough to cover all desired stakeholder

groups, using focus groups was justified due to the time it saves: all desired participants in a particular stakeholder group could be interviewed in a single sitting.

The main reason for choosing to conduct a focus group meeting with the dive masters was because of their more flexible schedules that allowed a suitable time for all to attend, compared to, for example, with dive instructors who were perceived to have less flexibility.

For the local dive center staff, another reason they were chosen for a focus group meeting was because of the language barrier, as previously explained. A local translator was hired to help translate the interview questions and to act as assistant facilitator during the focus group meeting. A focus group meeting allowed optimizing on time and translator availability by enabling the sampling of the whole stakeholder group in one sitting as opposed to individual interviews with a translator present in each.

4.3 Formulation of the interview questions

For both the semi-structured interviews and focus group meetings, a guiding list of questions had to be formulated. It should be noted that the same set of questions were asked of all participants in this thesis; both individual interview and focus group participants. These questions are listed later in this chapter in Table 4.3.

Basic demographic information was collected about all respondents, including which stakeholder group does the participant belong to, are they local Mozambicans or foreigners, how long have they been in Tofo and are they male or female.

To uncover the perspectives, priorities and values of the stakeholders i.e. to answer the second research question, the interview questions were constructed around the three pillars of sustainability: Economic, Social and Environmental. This approach was first suggested by Haddock-Frasier & Hampton (2010) who studied the sustainability of dive tourism in Malaysia and found the gap in the literature, stating:

> *"In order to understand whether the holistic perspective on sustainable development*
> *can be operationalized, however, we need to understand the extent to which different*

stakeholder types within the tourist system consider tourism to be a benefit or cost to them, regarding economic growth / contraction, social benefit/cost, and environmental conservation / degradation." (Haddock-Frasier & Hampton, 2010, p.9)

This sustainability approach was also used by Wongthong & Harvey (2014) who investigated possibilities for Integrated Coastal Management (ICM) and sustainable tourism (ST) of the scuba diving industry in Koh Tao, Thailand. According to the authors, the sustainability of a tourism destination can be advanced or slowed down by the stakeholders who are part of the tourism activity and who all have several interests and who interact with one another with differing priorities and perspectives. It is therefore necessary to consider both the physical impacts of tourism as well as the social environment to come closer to sustainable tourism.

Following the examples of Haddock-Frasier & Hampton (2010) and Wongthong & Harvey (2014), this thesis used the same sustainability approach to formulate the interview questions. Three of the interview questions were taken directly from these dive tourism studies.

Lastly, stakeholders were inquired about their thoughts regarding what actions need to be taken to sustain the long-term dive tourism industry in Tofo. This information was used to help formulate management suggestions to answer research question number three.

The questions below are the final interview questions that were used for the data gathering of this thesis (See Table 4.3). References after a question indicates that the question was taken directly from the study cited.

Table 4.3 The final interview questions.

Interview Question
Q1.   Of all the attributes that make Tofo a popular diving destination, how important do you think healthy reefs are for the dive tourism?
Q2.   What are / is your role in contributing and reducing impacts on the reefs in Tofo? (Wongthong & Harvey, 2014)
Q3.   How important do you think the scuba diving industry is for the local people in creating both direct and indirect jobs here in Tofo?
Q4.   What do you think about the development of the dive tourism industry in Tofo? Please mention some benefits and costs that you have noticed.
Q5.   Have you observed or do you think there have been any changes in the culture and language of the local population as a result from development of the dive tourism industry? (Haddock-Fraser & Hampton, 2010)
Q6.   In 5 years, how do you think the dive tourism industry in Tofo will have changed from today?
Q7.   What actions should be taken to sustain the long-term dive tourism industry in Tofo? (Wongthong & Harvey, 2014)

All the questions were open ended but for Q1 and Q3 the respondents were given a five point Likert scale (*Very Important, Important, Moderately Important, Slightly Important, Not Important)* to support their answers.

4.4 Exclusion of other data gathering methods

Alternative options for data gathering could have included questionnaires. MacDonald et al. (2013) state that in studies that explore values, questionnaires are too closed ended and do not allow for enough exploration. Questionnaires were also rejected because it was the perception of the author that it would have been very difficult to create a questionnaire that could be efficiently used for all stakeholders in this research. Also, based on the author's personal observations on site, questionnaires have not proved to be an effective data gathering method in Tofo. For example, questionnaires are often left at dive centers in the hope that the dive center employees encourage participants to fill them and consequently they were hardly ever filled out.

4.5 Data analysis

All interviews and focus group meetings were recorded using either a laptop or mobile phone or both. These recordings were then transcribed using the program Transcriptions (Version 1.1; Haselberger, 2015). The transcribed data was organized and analyzed based on Rabiee's (2004) framework analysis using version 1.1.0 of the program NVivo for PC (2015).

4.5.1 Framework analysis

This thesis followed the qualitative data framework analysis as compiled by Rabiee (2004) from previous works on framework analysis. This framework includes five key stages, which are: familiarization, identifying a thematic framework, indexing, charting, mapping and interpretation.

The data analysis process begins with the data gathering, where the researcher is expected to have good facilitation skills to generate rich data, accompanying them with additional observational notes and good quality transcriptions. The first stage is *familiarization* with the data through listening to the recorded files, reading through the transcripts thoroughly and reading through the observational and summary notes written immediately after the interviews. The purpose of this stage is to get an overall feel and idea of the topics before breaking it down into more specific parts.

Next, a *thematic framework* is developed through writing notes concepts and ideas on the margins of the text and by starting to develop categories. *Indexing* follows this stage; the data is thoroughly examined, picking out quotes and making comparison between cases. These quotes are then *charted* by separating them from their original context and re-arranging them under newly developed thematic contents. Indexing and charting can be viewed as managing the data.

The final stage, *mapping and interpreting,* requires the researcher to be imaginative and analytical to make sense of the relationships between different quotes, and connections within the data. Rabiee (2004) suggests the following headings for interpreting the assorted data: Words, Context, Internal Consistency, Frequency, Intensity of Comments, Specificity of Responses, Extensiveness and Big Picture.

First the actual *words* used must be considered; do the participants use certain key words correctly and do they correctly know what they mean. *Frequency* looks at how often a comment or view is made and *extensiveness* refers to how many participants expressed particular views. *Intensity* considers the depth of feeling attached to the expressed feelings and comments. *Internal consistency* asks to look at whether or not the opinions or positions of the participants change during the focus group meeting. Greater attention should be placed on responses that refer to personal experiences over hypothetical situations, which is called *specificity of responses.* Finally *Big Ideas* should be considered. These are larger trends or concepts that emerge as repetitive comments or ideas throughout the conversations.

Rabiee (2004) suggested using either a manual approach or using the help of a specifically designed computer program. Due to time constraints and the advantage of current computer technology, the transcribed interviews and focus group discussions were analyzed with computer software called NVivo from QSR International. The software is especially designed to store, organize, analyze and visualize qualitative data.

4.5.2 NVivo – Thematic coding and visualization of data

NVivo by QSR International is a qualitative data analysis software that allows the user to easily organize and code qualitative data and visualize those findings in various ways such as charts, word clouds, models, word trees and cluster analysis to mention a few. What allows this to be done effortlessly is the coding system underlying the whole process. NVivo permits the user to codify information into themes and subthemes that can then be explored further. The first term to be highlighted is *sources.* Sources are any materials that are brought into the program to be analyzed: transcribed interviews, Internet websites, scientific publications, videos and even audio recordings. In this thesis the only sources of information are the transcribed interviews and focus group discussions. The transcriptions are read through and emerging topics are categorized into themes, which are called *nodes* in the program.

Nodes

Nodes are a kind of envelope into which all that is said about a certain topic is stored. This can be illustrated with a theme from this thesis: *Environmental Change.* All interviews are coded in the program and all instances where any participant talks about environmental

change are coded under the node of environmental change (Figure 4.3). Once all transcriptions have gone through this coding process, every mention about environmental change by any participant can be found in this node. It is then possible to go into that node and further explore what was said and by whom about the topic of environmental change. When combined with other nodes coded around the same section of text, further examination allows one to see in what tone specific topics were discussed, for example if the general tone has been positive or negative when talking about environmental change.

Figure 4.3 Illustration of how references are coded into nodes

Nodes can be categorized as parent nodes and child nodes. This allows differentiating themes into broader themes, such as *Natural Environment*, and more specific themes within that broader theme, such as the aforementioned *Environmental Change*. All new themes emerging from the transcriptions are coded as new nodes or child nodes and together these nodes form a node hierarchy. Theoretically there can be an unlimited amount of nodes and it is up to the researcher to become familiar enough with the data to be able to discover relevant nodes and child nodes. This process is exactly what Rabiee (2004) calls developing a thematic framework. In addition to context nodes, it is suggested that nodes describing feelings, personal experience or memorable quotes should also be added to support the data analysis.

Analysis of Data

Once all transcriptions are coded into the program, it is possible to run different types of analyses on the data. Firstly, the nodes can be organized to see which ones had the most coded references and uncover what Rabiee (2004) refers to as *frequency*. In other words

this reveals which themes were most talked about by the participants. These prominent nodes can then be analyzed in terms of how many individual participants talked about those themes, which refers to *extensiveness* (Rabiee, 2004). All coded references in the main nodes are also read through to get a better understanding of what is being said about those nodes. Finally, it is important to look separately at which nodes were most coded per stakeholder group. This will reveal stakeholder priorities by giving visualization of what different stakeholder groups focused the most on.

Number of Coded References vs. Percentage Coverage

The program allows for two different types of values to be used for analysis: Number of coded references and percentage coverage. The number of coded references refers to the number of individual instances that are coded to a specific node. The coded references can be anything from one word to one paragraph. The percentage coverage describes the percentage of the interview that is coded into a specific node. In the results, the most coded themes are presented with the number of coded references. Percentage coverage on the other hand is used to represent which themes were talked most by which stakeholders. This is to eliminate the bias towards stakeholder groups with more or fewer respondents. For example, there were four dive center owners and two accommodation owners interviewed. If the number of coded references was used, the dive center owners would probably have more coded references than the accommodation owners simply because there were more of them. Using the percentage coverage removes this bias as the percentage is calculated for each stakeholder group separately, thus revealing equally the most prevalent themes per stakeholder group.

4.6 Methodological limitations

The data gathering for this thesis was divided between in-depth interviews and focus group meetings. The justifications for the choice of different stakeholder groups for different methods were explained in chapter 4.2. There are, however, some limitations to this approach that cannot be ignored in the data analysis and conclusion sections. Kaplowitz & Hoehn (2001) conducted a comparative study on the data produced in focus groups and in-depth interviews in a natural resource setting. They researched local perceptions on mangrove ecosystem services, values and issues by hosting focus groups and conducting in-depth interviews within the local community in Mexico's Yucatán Peninsula. Their

findings suggest that the two methods are not substitutes but complementary towards each other, revealing somewhat different perspectives on the topic. To provide practitioners with the most accurate perspectives of the relative importance of ecosystem services, the authors suggest that valuation researchers should use both methods. In this thesis the stakeholder groups were investigated with either interviews or focus group meetings and not both. It is therefore possible that the responses could have been different had both methods been used complementary instead of just one or the other.

4.7 Research ethics

Confidentiality was something that was emphasized to all respondents, as it was the wish of the author that the respondents would not hold back any sensitive information that they thought might jeopardize their jobs if they were identified by name. To this end, a consent of participation form was developed that was signed by each participant taking part in the interviews or focus group discussions. For local respondents the consent form was also available in Portuguese. All responses were anonymous, and all references to individual respondents were made based on their stakeholder group. For example: *"a dive instructor stated that..."*

All respondents were offered a copy of the consent form and another kept by the author. E-mail addresses were optional if the respondents wanted to review the discussion transcript or wanted a copy of a future publication of the study.

5 Results

5.1 Major themes discovered

After coding all of the transcribed interviews and focus group discussions, certain themes emerged as the most coded. The number of coding references per node was used as a measure of most prevalent themes. Table 5.1 shows the twenty most coded themes in all nodes to either a single node or as aggregated to a parent node. Aggregated means all the coded references to the child nodes are accumulated for the parent node. Table 5.2 shows the twenty most coded themes to any single node without aggregation. The different nodes are color coded for ease to identify into what parent node they belong to. Parent nodes are identified by bold font and following child nodes are behind the dash line (\).

Table 5.1 Most coded themes based on aggregate number of coded references

Nodes	Aggregate number of coding references
Natural Environment	372
Economy	252
Social	196
Natural Environment\Environmental Impacts	164
Economy\Diving	110
Management Suggestions	80
Natural Environment\Environmental Impacts\Diver impacts	77
Natural Environment\Mantas and Whalesharks	77
Dive Tourism Industry	59
Social\Language	59
Economy\Tourists	58
Natural Environment\Environmental Change	58
Social\Environmental Education	50
Government	46
Natural Environment\Environmental Knowledge	45
Natural Environment\Environmental Impacts\Fishing Impacts	42
Economy\Locals + fishermen	41
Economy\Non Diving	41
Infrastructure and Services	41
Natural Environment\Environmental Protection	41

Table 5.2 Most coded themes to any single node

Nodes	Number of coding references
Economy\Diving	110
Natural Environment\Environmental Impacts\Diver impacts	77
Natural Environment\mantas and whale sharks	77
Natural Environment\Environmental Change	58
Social\Environmental Education	50
Natural Environment\Environmental Knowledge	45
Natural Environment\Environmental Impacts\Fishing Impacts	42
Economy\Locals + fishermen	41
Economy\Non Diving	41
Infrastructure and Services	41
Natural Environment\Environmental Protection	41
Social\Language\English	39
Management Suggestions	31
Natural Environment\Environmental Impacts	30
Economy\Tourists\Foreign Tourists	29
Social\New Opportunities and Alternative Livelihoods	28
Social\Cultural Change\Exposure to western culture	24
Dive Tourism Industry\Cooperation	23
Government\Making tourism difficult	22
Management Suggestions\MPA	22

This information can also be shown in a chart hierarchy as seen in Figure 5.1. The larger the box, the more references there are to that node. Child nodes within the parent node are color coded to a fainter shade of the parent nodes color.

Figure 5.1 Most coded nodes illustrated by box size

5.2 Main issues and stakeholder coverage of the major themes

The major themes of the data were illustrated in the previous section. This section further explores those themes by presenting the most common issues that the participants discussed about. To support this analysis, the number of coded references to selected nodes is visualized with the help of node hierarchy diagrams. The diagrams show all child nodes for a given parent node and illustrates which child nodes were the most referenced by showing the numbers of coded references to them with a number in the middle of that node (e.g. Figure 5.3).

The following six parent nodes are discussed in more detail below: *Natural Environment, Economy, Social, Management Suggestions, Dive Tourism Industry* and *Government*.

5.2.1 Natural Environment

The *Natural Environment* parent node was aggregately the most talked about node (n= 372). From the twelve child nodes under the *Natural Environment* parent node seven are in the top 20 most coded (Table 5.1). The five most referenced child nodes are *Diver Impacts, Mantas and Whale Sharks, Environmental Change*, *Environmental Knowledge* and *Fishing Impacts* respectively (Figure 5.2). These nodes are now explained and analyzed by looking at what was discussed within each of these nodes and which stakeholders talked most about them.

Node hierarchy for Natural Environment (n= 372)
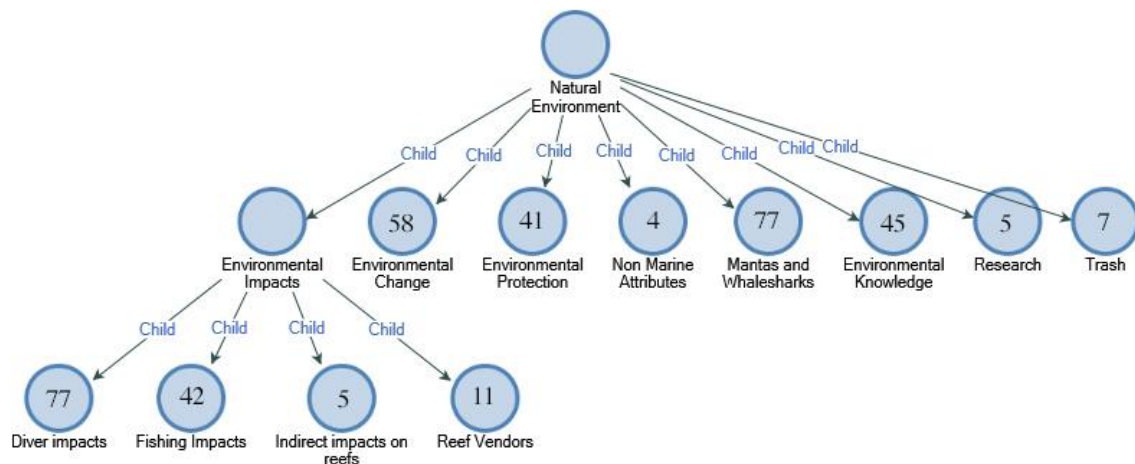
Figure 5.2 Natural Environment parent node and emergent child nodes

Diver impacts were most discussed by dive instructors, dive masters and conservation NGO scientists whilst the local dive center staff and accommodation did not talk about them at all. This node contains all references to impacts caused by SCUBA divers or ocean safari snorkelers. References included perspectives that divers both do and do not cause damage to the reefs or animals.

> *"There's definitely diver impact on the reefs. You compare dive sites like Salon that has been dived here for 10 years, to Fingers, which is a new site. They are 500m apart and the difference in marine life and health of the reef is huge."* – Dive Instructor

> *"From diving I don't think you can do so much damage, no one's really kicking the coral or picking animals so…"* – Dive Tourist

Diver impacts on reefs were seen as direct physical harm to the reefs caused by kicking or touching the reefs and diver error. Beginner divers and inexperienced divers were mentioned to be a group of divers with a higher chance to cause damage to reefs due to lack of low-impact diving skills, with the most important being good buoyancy control. More popular reefs were mentioned to suffer higher impacts as they are visited more frequently. Many suggestions were put forth prioritizing the reduction of diver impacts on the reefs such as only taking higher impact divers to certain dive sites and excluding them

53

from others until their buoyancy skills are appropriate. Diver impacts to animals were also discussed and speculations included impacts of divers on manta rays as the divers swim into or close to a manta cleaning station: the areas where it is most likely to encounter a manta ray.

"It's like a manta going to a cleaning station, you just being there will scare them away" – Dive Master

Diver impacts were not believed to be the only reason for the disappearance of species but were also associated to fishing and global changes in the environment and climate change. Many stakeholders pointed out diver education as a way to reduce diver impacts. Dive instructors highlighted the importance of dive briefings as an opportunity to educate dive tourists on proper behavior underwater emphasizing the three T's: don't touch, don't tease and don't take.
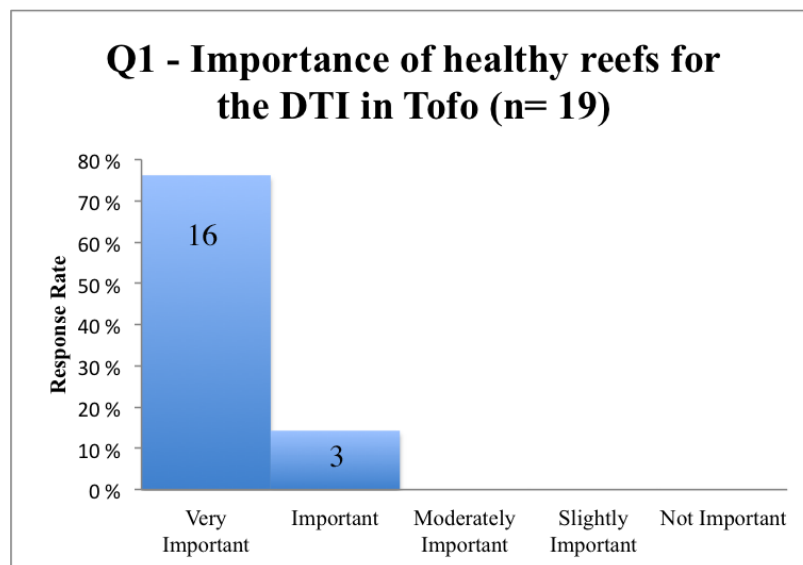
Figure 5.3 Respondent ratings for Q1

Figure 5.3 visualizes the respondent ratings for interview Q1 that asked: How important do you think healthy reefs are for the DTI in Tofo? The majority (76%) rated the reefs as Very Important and 90% rated the reefs Very Important or Important. One respondent answered "between Very Important and Important" that is not a valid answer and one respondent did not provide an answer at all. Their responses are not included in Figure 5.3 above. The

responses include focus group meetings where there is one agreed upon response per stakeholder group.

The *mantas and whale sharks* theme had the same amount of coded references (n=77) as the diver impacts node, making it also the most referenced node under natural environment, which is not surprising given the role they play in the DTI of Tofo. All stakeholder groups had participants that mentioned these marine animals, which emphasizes the relevance that these animals play in the lives of all the stakeholders. A few main themes emerged within this node. The first one is the importance of manta rays and whale sharks for the DTI of Tofo. These marine animals were referred to as a lure and the main reason dive tourists come to Tofo.

> *"The scuba industry is the reason why so many people come here. To go diving with the mantas and whale sharks and all that."- Dive center Owner*

Another frequently arising topic in this node was the evident decrease in the numbers of manta rays and whale shark sightings over the years.

> *"Before, in 10 ocean safaris you'd have eight or nine to guarantee to see (whale sharks) and right now it's different. – Dive Instructor*

The link between healthy reefs and the abundance of manta rays was evident for most of the stakeholder groups highlighting their knowledge of the local marine ecosystems. The local dive center staff and the local – stakeholder groups did not reveal marine ecosystem knowledge on manta rays and whale sharks, but did show understanding of the importance of these animals in bringing the dive tourists to Tofo.

Environmental Change was the third most coded node under Natural Environment. The dive tourists had no coding into this node, which can be due to the fact that all the tourists interviewed were first time visitors and therefore have not been long enough in Tofo to notice changes in the environment. Prevalent in this node once again was the notion that manta ray and whale shark sightings have decreased. Other marine species, such as leopard sharks, cleaning shrimps and cleaner fish were also mentioned to have disappeared from

certain reefs. The locals mentioned a decrease in fish catch from their fishing efforts around Tofo. Not all comments on changes in marine species were negative, as multiple participants mentioned the increase in humpback whale numbers as a positive outcome of environmental change. Many participants also mentioned climate change or global warming as a possible driver for the changes in species observed in Tofo. For example one link made was between climate change and a shift in prevailing currents and the abundance of plankton, the main food source for both manta rays and whale sharks. One dive center owner who has been in Tofo for over 10 years also gave an example of the effect of hurricanes on the coastline in Tofo. In that example a hurricane ripped out coastal vegetation along with the beach road resulting in a beachfront permanently changed from before.

In the *Environmental Knowledge* node, all instances where participants showed knowledge of environmental issues were coded. This node portrays how well the different stakeholders are educated in environmental topics. All stakeholders, except for the accommodation and restaurants coded references under this node. Many stakeholders showed understanding of the symbiotic relationship between healthy reefs, and abundance of marine species: cleaning fish and namely the manta rays. Manta ray cleaning stations, the main reason why the mantas are around Tofo, were often brought up. One of the locals interviewed, a spear fisherman, showed environmental knowledge regarding destructive fishing methods. He pointed out the importance of leaving the reefs intact and not taking out small fish or crayfish as such behavior is *"killing our future"*. By leaving the reefs intact, he referred to reef vendors who have a stall in the market place and are selling shells and reef, an act that is illegal according to two respondents.

Three participants also pointed out the lack of environmental knowledge by some of the locals. Lack of knowledge was blamed for destructive fishing methods such as the use of gill nets, extraction of small fish and extraction of reef to sell as souvenirs.

Under the *Fishing impacts* node, all mentions of impacts resulting from fishing were coded. All stakeholders but the dive masters and dive tourists coded references to this node. Net fishing was highlighted by five of the respondents as the fishing style with highest impacts all around. Net fishing has negative impacts for both the coral reefs and

marine species. *"Shooting nets"* on reefs, as one dive instructor phrased it, causes damage to reefs when they are dragged along the seabed. The nets get stuck on the reef and cause breakage. Sometimes the nets are left overnight on the reefs, which is illegal in Mozambique. One accommodation owner sees this effect magnified now that the fishermen know where the reefs are and have realized their catches are higher on the reefs, leading to more impacts on reefs. Regarding the species, the nets are indiscriminate and catch everything, including untargeted species. The NGO scientist interviewed says that the biggest threat for whale sharks, mantas, turtles, dolphins and sharks is gill nets and that removing gill net fishing would reduce, if not remove, fishing as a near shore anthropogenic threat. Fishing with nets also leads to juvenile and undersized fish being caught, which is bad in the long run.

The tourism industry is seen as a driver for increased demand in fish as tourists want to eat seafood while in Tofo. This leads to fishermen targeting desired species like lobsters and crayfish, and without proper environmental knowledge can lead them to take out juvenile as well as egg-bearing breeding females.

5.2.2 Economy

The *Economy* parent node is aggregately the second most referenced node (n= 252). Out of the nine child nodes, four are in the top 20 most coded nodes. The child node *Diving* is the most referenced node of all in this thesis (n= 110). The other notable child nodes presented here are: *locals + fishermen, non-diving* and *foreign* and *South African tourists* (Figure 5.4)*.

Node hierarchy for Economy (n= 252)
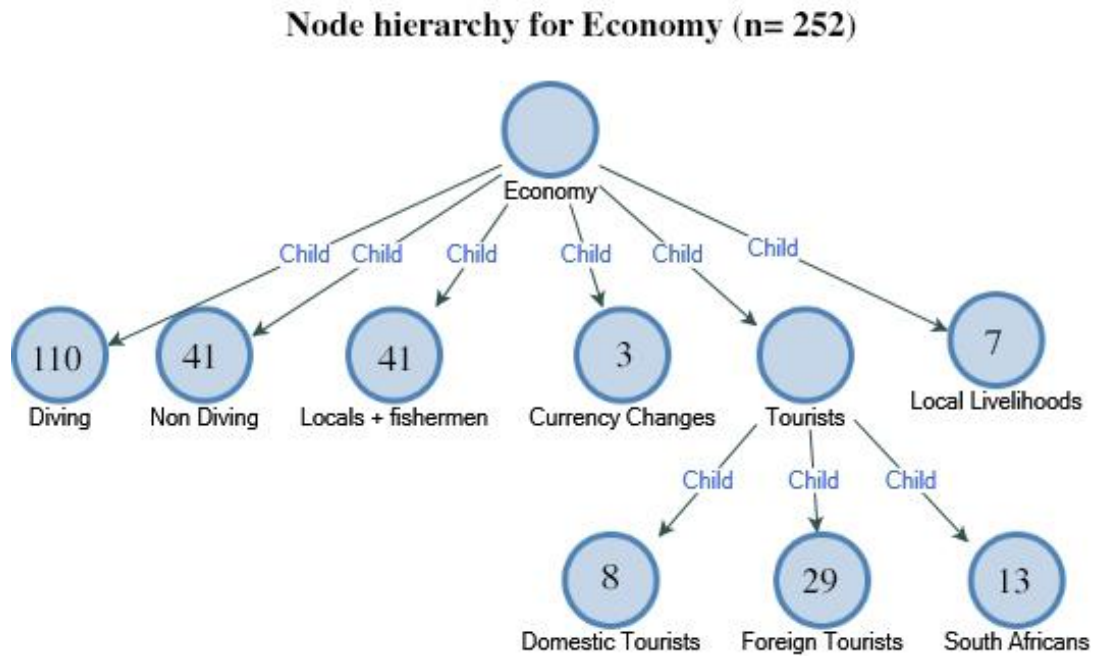
Figure 5.4 Economy parent node and emergent child nodes

In the *Diving* node, all references to the dive tourism industry as a part of the economic sector of Tofo were coded. All interview participants and both focus group meetings coded references to this node and the general consensus among them was that the DTI is the underlying reason why Tofo has developed to the degree it has to this day. Most services and infrastructure, such as the hotels, restaurants and shops, have contributed to the emergence of the DTI. Some things built for tourists also benefit the locals. Such examples are water treatment, health care, shops and products, public transport, roads and trash collection and disposal. Dive tourism and the dive tourists are perceived to be the primary economic driver in Tofo. Without the DTI and the dive tourists, many respondents perceived, Tofo would *"just be another fishing village"*.

> *"Everything revolves around the 4 dive centers. These dive centers attract the customers who then occupy let's say 30 different lodges … It's these dive centers that then bring the customers for the lodges and the restaurants so if you would take the diving out of the equation you would basically be almost destroying Tofo's economy." – Dive center Owner*

Eight respondents suggested that the coastline of Mozambique is beautiful and there are many beautiful beaches all along the coast and while Tofo has a nice beach, it alone would not suffice to bring in tourists. The diving is the main reason why people come to Tofo in the first place. One dive tourist said, that whilst diving is the main reason that people come to Tofo, not all tourists are necessarily divers. They might be part of a group where one person is a diver and the others came along because of that person.

The *locals + fishermen* node contains references to locals working in the dive centers and local fishermen. The *non-diving* node contains references to economic activities that are not diving related. There is some overlap in these nodes so they are presented together. Once again, many of the references highlight the importance of the DTI as a driver for many livelihoods in Tofo. In addition to what was presented in the previous section, these nodes also present the change in opportunities that have risen for the locals because of the development of the DTI. There has been changes in livelihoods, as people who before were mainly fishermen, have found new jobs working either directly in the diving industry as captains, mechanics, dive masters, dive instructors or indirectly by selling souvenirs or working in restaurants or accommodations. One accommodation owner said that locals have even migrated from the surrounding communities to come work in the tourism sector in Tofo. So in terms of livelihoods, the DTI is perceived as a highly important employer both directly and indirectly as is also illustrated in Figure 5.5 below.
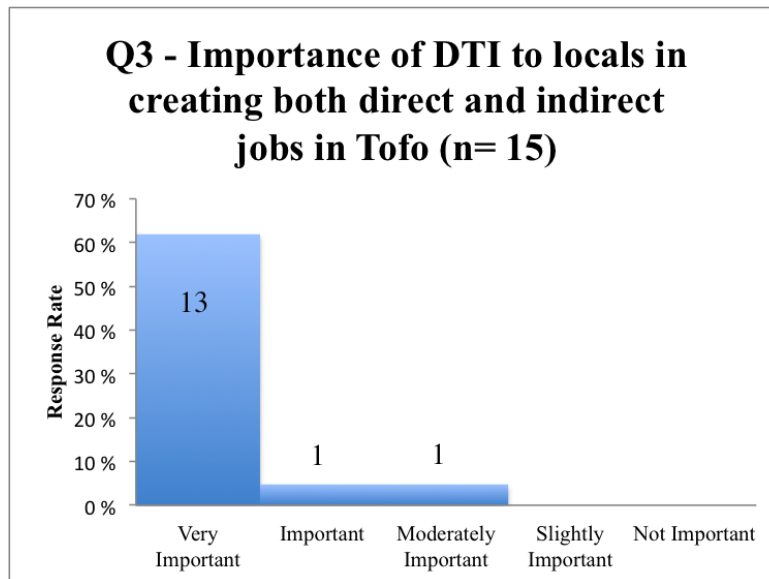
Figure 5.5 Respondent ratings for Q3

The importance of the DTI in creating both direct and indirect jobs for the locals was asked in interview Q3 and the results can be seen above in Figure 5.5. The majority (62%) of the respondents thought it is Very Important, 5% think it is Important and Moderately Important. There were four respondents who answered "between Very Important and Important" that is not a valid answer and two respondents who didn't provide an answer and their responses are not included in Figure 5.5 above.

In the *non-diving* node, perspectives were given on new future additions to the current offering of tourism activities in Tofo. A dive center owner highlighted the sea horses in the estuary as something that tourists would like to see and also as a way to protect them as they are now sold in bulk for Chinese medicinal use. The dive masters pointed out the need for dive centers to expand on the variety of activities offered if the tourism were to decrease, more *"land based and cultural things"*.

Regarding *Tourists*, there is a perceived shift that the proportion of once the primary group of tourists, the South Africans, is decreasing and more European and domestic Mozambican tourists are arriving in Tofo. The following reasons were offered: Mozambique is more and more seen as a new and exciting tourist destination by Europeans and it is becoming more accessible, two dive centers have new European owners that attract more European tourists and the Mozambican middle class is growing due to economic prosperity in the country creating a domestic tourism market. The latter has been

60

experienced as an increase in domestic tourists in Tofo who are yet to embrace diving, but are more likely to enjoy the beach and related tourism infrastructure present in Tofo.

5.2.3 Social

The *Social* parent node was the third most coded parent node (n= 164). The most notable child nodes emerging from the data were: *Environmental Education, Language, New Opportunities and Alternative Livelihoods* and *Exposure to Western Culture* (Figure 5.6).
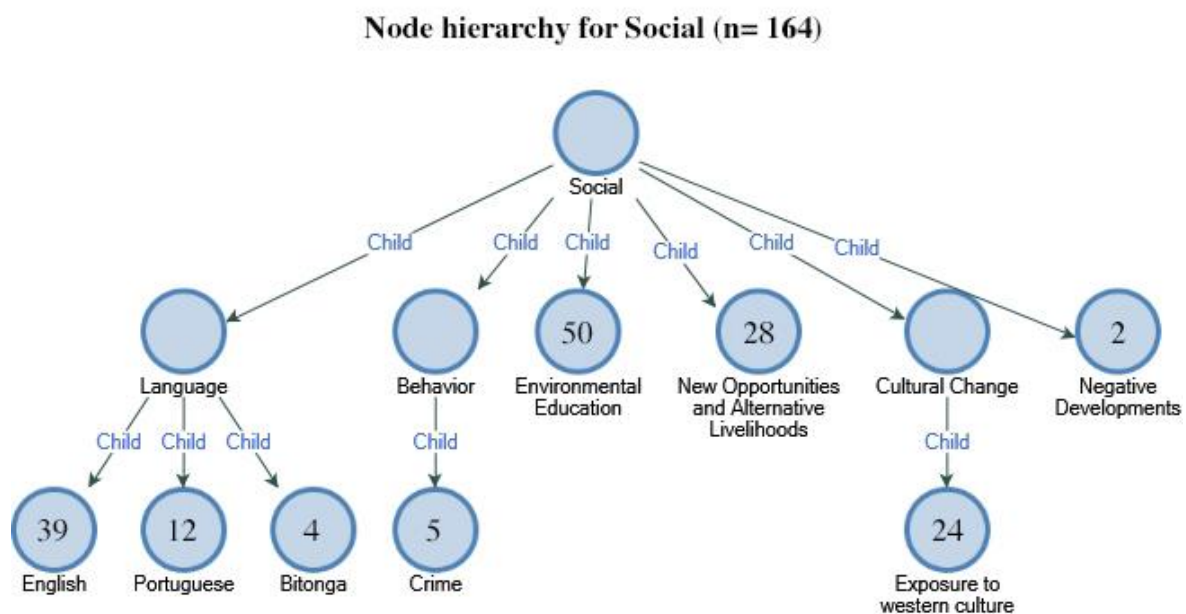
Figure 5.6 Social parent node and emergent child nodes

Interview Q5 asked if the respondents had observed or think there have been changes in the language and culture of the local people as a result of the development of the DTI in Tofo. With the exception of three respondents, all others mentioned the fact that most locals can speak English as the main change, often drawing a comparison with the lower level of English present in less touristic areas of Mozambique. This is seen as a result of the DTI, as it is a prerequisite to speak English to be able to work in the dive centers, and English proficiency helps locals do business with primarily English speaking tourists. Cultural change was defined as a change in primary livelihoods, which have shifted from traditional ones like fishing to working in the tourism sector. The interest for locals to become involved in the dive industry was described by one dive center owner to be not only because of income, but because:

"They think it's cool, they see the people, they like the lifestyle, they start showing interest". – Dive center owner

Environmental Education was the most coded child node under *Social*. The main subject was the desire to get more environmental education to the locals, especially on marine topics. Some believed that simply by having the dive centers around increases awareness of marine issues, whilst others still found it necessary to have more environmental education opportunities for the locals. Locals were perceived to be taking part in destructive fishing methods and pulling out important species to provide for their families, because they did not know any better. Environmental education is seen as a way to raise awareness of important marine topics: what species are found in the ocean in Tofo, why are they important, what will happen if they disappear, understanding how size restrictions on fish would benefit everyone, etc. Environmental education was also seen as a generational issue. It is harder to persuade people to change their habits if they have been doing the same thing their whole lives. This was even identified by the locals as is illustrated by a quote from one of the dive center local staff:

"If you've been wearing your t-shirt one way your whole life, and while grown up, they tell you you've been wearing your t-shirt the wrong way all the time, they'll tell you to f*** off". – Local dive center staff

Instead, many respondents highlighted the priority to educate the children, as they are the generation of the future. In terms of who would be responsible for the education, the local dive center staff nominated the dive centers to bear responsibility to provide communal marine education for locals. At the moment, the MMF has programs for community education, but the stakeholders still called for more opportunities.

Exposure to western culture was a recurring theme and contained references to the influx of western tourists with western values, items and behavior, which rubs off on the locals, in addition to exposure to western media through TV and Internet. Positive outcomes were categorized as an increased knowledge of other cultures and ways of life. Negative outcomes were associated with the exposure to technology and a different level of wealth. A few respondents mentioned increase in crime and suspected it is due to locals seeing

what the tourists have, cell phones, cars, TVs etc., which has created jealousy and a desire to also possess such trophies of western civilization.

5.2.4 Management Suggestions

The *Management suggestions* parent node was aggregately the fifth most coded node (n= 80). Most of the coding for this node was a result of discussions arising from interview Q6 and Q7, with a higher coverage coming from Q7, which asked: What actions should be taken to sustain the long-term dive tourism industry in Tofo? The management suggestions were varied but a few common ideas emerged and were coded as child nodes. These were: *Marine Protected Areas (MPA), Education of Locals, Diver Impact Reduction, New Dive Sites* and *Other* (Figure 5.7).
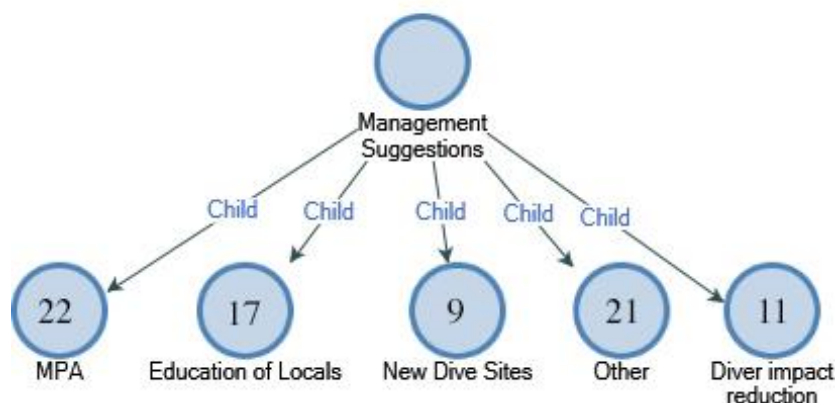
Figure 5.7 Management Suggestions parent node and emergent child nodes

Diver Impact Reduction methods were most commonly suggested by dive masters, instructors and dive center owners and included methods like taking only good divers to certain reefs, emphasizing low impact diving behavior both with regards to the reefs and certain marine species in dive briefings and being a good role model to dive tourists. A spinoff of reducing diver impacts was the notion of looking for new dive sites around Tofo. The idea is to reduce pressure of the existing, perhaps more heavily dived reefs. This has worked in Tofo before as was mentioned by a dive instructor:

"With the people starting to dive Reggies (new dive site), took a massive amount of pressure off Office (old dive site in the same region). Otherwise the only ones we really had in the north, Amazon and Hospital and Office and it took a lot of pressure of them. There's a lot of dive sites in the north, it's just a case of getting out and trying to find them." – Dive Instructor

The effort to find new dive sites is seen as a collaborative effort between all the dive centers.

As was the case under *Environmental Education* under the social parent node, *Education of Locals* was also coded as a management suggestion to raise awareness of marine issues and thus decrease impacts. It is unclear who would take responsibility for that education but the consensus amongst the dive center local staff is that the dive centers need to be doing more in terms of offering community marine education.

References to any kind of protected area solution were coded under the *MPA* node. The conservation NGOs, accommodation, dive center owners and dive instructors had references to a protected area suggestion. Many different terms were used in the interviews: Eco Park, Marine Reserve, Specific Use Area, Partial Marine Reserve, Marine Protected Area, Locally Managed Marine Area and Protected Natural area. Regardless of the term used, all of the suggestions had in common the interest to protect the marine species, whale sharks and manta rays. An additional benefit of having a protected area was seen in the promotional value that it would give Tofo. Designation as a protected area is seen as an attribute that will increase the influx of dive tourists, as the tourists are perceived to appreciate protected areas. It was evident that the respondents believed that the planning and creation of any type of protected area must be done collaboratively with all the stakeholders in Tofo. It must also benefit all stakeholders including communities as well as the dive centers. Measures to establish protection included stakeholder buy in, cooperation from the governmental agency Maritima, reasonable fees and patrol boats for enforcement. The NGO employee interviewed envisioned an eco park type of solution that expanded the protected area to include also terrestrial areas.

"... Manage everything from waste through electricity generation to how water and land based activities are all done with the local population in mind, with the ecosystems in mind, then you could safeguard the ecosystems that people come to visit here". – NGO employee

In addition to the main management suggestions presented above, additional individual suggestions were categorized under the Other node. The suggestions in this node can be divided into the following themes: Diving Related, Terrestrial issues, Tourism Services and Community Efforts.

The diving related theme had the following suggestions: More clarity about rules and regulations for dive center owners, manually introducing artificial reefs and wrecks as new dive sites, give rest periods for certain reefs and cross promotion of dive centers across different countries.

The terrestrial issues theme included the following: Prohibition signs on the beach for example disallowing manta fishing, stopping the reef vendors from destroying more reefs, engagement with restaurants to encourage buying only sustainably caught fish, trash control in the form of introducing recycling.

The tourism services theme was only talked about by dive tourists and included: ATM or card payment facilities in Tofo, better public transport, airport shuttle, addressing the reoccurring power outage problem, more Wi-Fi locations.

Finally, community efforts included: coordinated tourism promotion, more dialogue with the province capital, Inhambane, and a biannual forum for scientists in Tofo to present their research.

5.2.5 Dive Tourism Industry

The *Dive Tourism Industry* node contains references to the locals who work at the dive centers, to cooperation between dive centers and on the scale of dive tourism in Tofo. The most coded child nodes are *Cooperation, Local Divers* and *Scale* (Figure 5.8).

Node hierarchy for DTI (n= 59)
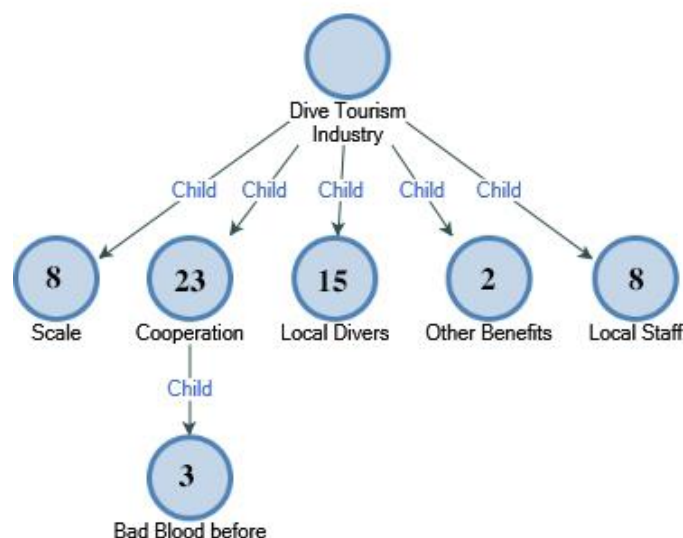
Figure 5.8 DTI parent node and emergent child nodes

One thing that came up multiple times by many respondents was the change in the atmosphere of cooperation in Tofo after two of the dive centers changed ownership. Before, the dive centers were in steep competition with each other and at times they were even trying to sabotage each other's businesses. After Tofo Scuba and Liquid Dive Adventures got new European owners the situation has changed. The dive centers now cooperate more together, helping each other during equipment failure, sending tourists back and forth between the dive centers and past mischievous sabotage behavior has disappeared completely. This is evident in the comments of dive center owners, dive masters and instructors, the accommodation respondents and even the dive tourists:

> *"As a tourist and as somebody who comes here to do diving, it's nice to see the schools don't have this sharp competition, they might have some differences but generally to us it always appears that they are quite amicable, they work together well and that just makes the experience nicer." – Dive Tourist*

Hiring locals to work in dive centers, both as dive leaders and maintenance and skipper staff is seen as a highly positive thing amongst the respondents. It is perceived as a new way to earn income for locals as they can acquire training for a profession such as chefs, captains and dive masters. It is basically an opportunity that would have been difficult to

accomplish without the dive centers. It is also seen as positive for the protection of the reefs through the increased awareness and environmental knowledge of the locals working in the dive centers. A few examples were given where a local instructor was sent to talk to local fishermen after they were seen fishing a large number of important species. The foreign dive centers owners see themselves as powerless to make a difference in such cases but see the locals as a way to influence the perceptions of the fishermen. One dive tourist said that:

> *"... if they (local dive masters and dive instructors) buy into the conservation ideology of things, I mean they're gonna be your biggest supporters." – Dive Tourist*

The scale of the DTI is perceived to be good. The scale of diving in Tofo is seen to be fairly small compared to other places like Egypt or Thailand. While this brings in less proceeds, the general consensus is that the smaller scale of the diving industry is advantageous. As one dive center owner put it, it allows the divers to have the reefs for themselves for enjoyment. Maintaining the small scale of the diving sector, in terms of only having four dive centers in Tofo, was a desire expressed by many respondents.

5.2.6 Government

All references to actions of the government were coded under the *Government* node. The three child nodes that emerged are: *Making Tourism Difficult, Political Instability* and *Power to Conserve* (Figure 5.9).

Node hierarchy for Government (n= 46)
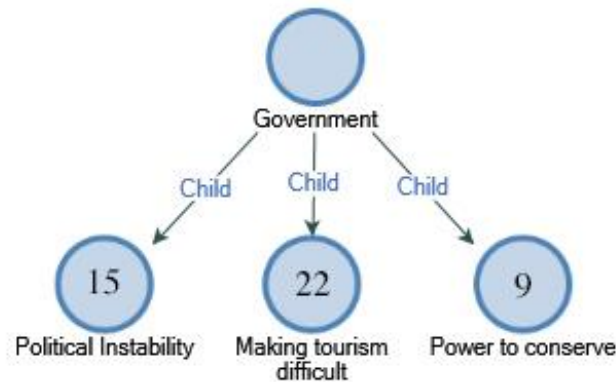
Figure 5.9 Government parent node and emergent child nodes

All stakeholder groups mentioned the political instability in Mozambique. Most gave examples of decreases in the number of tourists in previous years where there had been military clashes between the government and opposition. Whilst the situation was peaceful at the time of this study, the general consensus amongst respondents is that it is unknown and hard to predict if that situation will flare up again, but if it does, it will definitely affect tourism negatively.

Some respondents equated dissatisfaction of tourists to police harassment on the roads to Tofo. Many roadblocks exist in the main road from the capital to Tofo, in which at least in the past, tourists were targeted by the police and were fined on ludicrous charges such as driving without shoes or leaning an arm out of the window. Visa fees were also a common discussion topic. Visa fees have increased from around 50$ to 100$ in a matter of years which raises concerns amongst the respondents that tourists will not want to come to Mozambique.

> *"You're looking at like 80 - 100$ now to enter the country. Why would a tourist use so much money to enter Mozambique when they can travel the west coast (of Africa) for free." – Dive center Owner*

The government has also made running a tourism business in Mozambique gradually more difficult as was expressed by the dive center owners. They believe that the government is specifically targeting the white dive center owners by tripling taxes, creating new laws no-

one knows about written in Portuguese and implementing random license fees. With all the new laws and regulations, the dive center owners expressed the difficulty of finding that information.

The respondents also expressed thoughts on the government's power to conserve. The dive center owners and dive instructors would like to see more governmental interference to illegal fishing and greater political will to conserve the marine species that are important for tourism.

5.3 Most coded nodes within a stakeholder group

In the previous section the major themes of all the transcriptions were ranked and presented based on the number of coded references. It is now important to look at what were the most covered themes within a stakeholder group to get a better idea what different stakeholders concentrated on. This is done with the help of bar graphs that depict the percentage coverage of the themes per stakeholder group. In addition to the context themes presented in the previous section, this section will present the *perspectives, priorities* and *values,* by looking at the references coded into these nodes by the different stakeholder groups.

5.3.1 Accommodation

Two accommodation respondents were interviewed. The respondents talked most about the *Diving, Fishing Impacts* and *English* nodes (Figure 5.10).
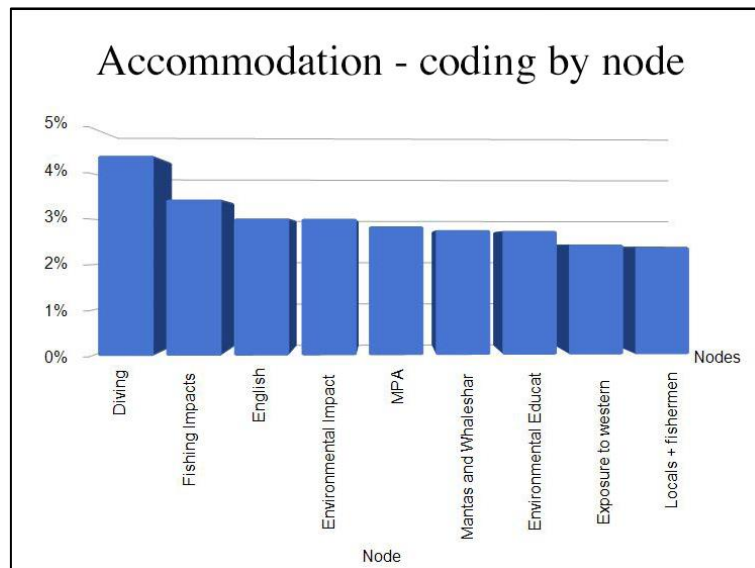
Figure 5.10 Most coded nodes for the Accommodation stakeholder group

The accommodation owners shared the notion that diving is the main driver for development and livelihoods in Tofo and is essentially the reason why their accommodation establishments exist. They do not see themselves as having direct impacts on the reefs but indirectly through ensuring their establishment is eco-friendly: not having shells as decoration, not serving undersized fish and providing environmental information to their guests. They also view that the English proficiency of the locals has increases due to the DTI. They both suggest a protected area and giving the local children a personal experience with the ocean instead of only lectures. The accommodation owners wished that the government would prioritize tourism and dive tourism. Their values are in decreasing impacts on reefs as referenced in the eco-friendly establishment comment above. One of the accommodation owners allows for advertising by the dive centers in his hotel, so he can be said to have a cooperative value set.

5.3.2 Dive Instructors

The dive instructors talked most about *Diver Impacts* on the reefs, the *Mantas and Whale Sharks* and *Environmental Change* (Figure 5.11). Three of the dive instructors believed that there are definitely negative diver impacts on the reefs while one of the instructors said he does not see negative changes in the reefs but in fact positive changes. The dive instructors prioritize low impact or environmentally friendly diving practices: teaching buoyancy control, emphasizing not to touch or kick the reefs and making sure divers know how to interact with the animals.
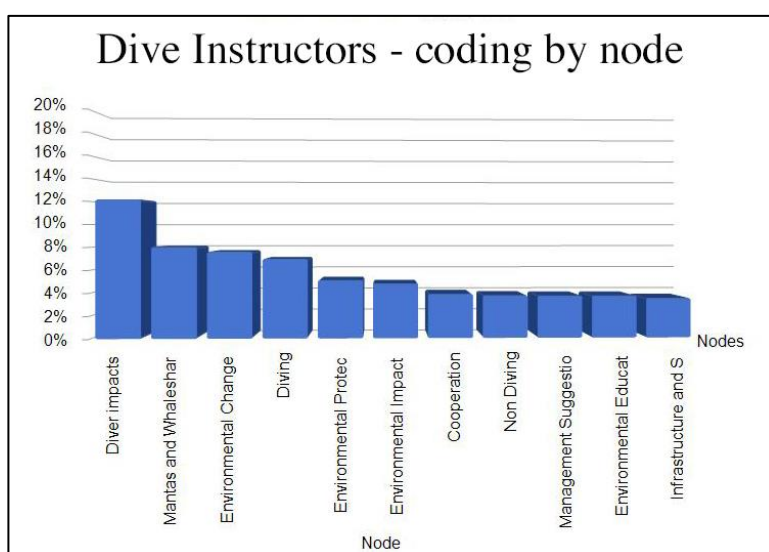
Figure 5.11 Most coded nodes for the Dive Instructors stakeholder group

The dive instructors emphasized the importance of healthy reefs and protecting them because "*if you don't, most of the species will go extinct and will disappear*". It is evident from these kinds of comments and their priorities that the dive instructors' values lay in environmental protection. One dive instructor even said that he does not want to see the DTI growing more in Tofo because more tourists would be more destructive on the reefs even though it would bring in more money.

5.3.3 Dive Masters

The most talked about nodes by the dive masters were *Diver Impacts, Mantas and Whale Sharks* and *Diving* (Figure 5.12). They acknowledge that the main reason why dive tourists come to Tofo is to see mantas and whale sharks. They understand the relationship between healthy reefs and manta rays and therefore categorized healthy reefs as Very Important to the DTI in Tofo. They identify their roles as *"stopping divers from messing up the reefs"* and see themselves as having a larger responsibility in the health of the reefs than the instructors. The instructors are seen as group leaders, but the dive masters are the ones keeping the group intact and making sure the customers are not going too close to the reef and accidentally kicking them. They are the "*hands and eyes of the instructor"*. They prioritize, similar to the dive instructors; keeping bad divers away from areas that they know have delicate reefs and macro fauna.
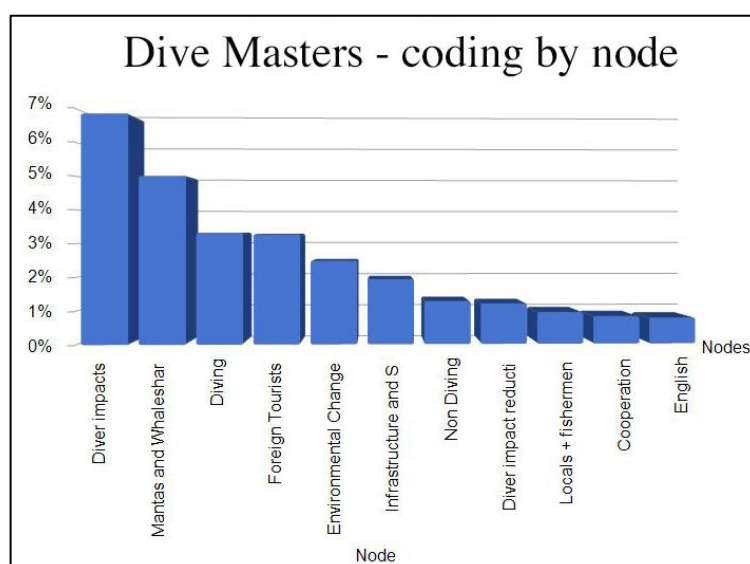

Figure 5.12 Most coded nodes for the Dive Masters stakeholder group

They classify the DTI as Very Important in creating both indirect and direct jobs for the locals as per the following quote:

> *"Yeah, I think it creates a lot of jobs. That's pretty much the whole of Tofos'
> economy".*

72

The dive masters was the only stakeholder group that believed that in the next 5 years, at least one or two of the dive centers will close down due to a decrease in tourist numbers. The dive masters acknowledge their indirect impacts on the reefs when encouraging tourists to look at something close to the reefs, which can lead to destructive contact with reefs. They also portray respect to the underwater world as per the following comment:

> *"We are foreigners in the underwater world. We are not invited as guests so you have to be respectful."*

5.3.4 Dive Center Owners

The dive center owners talked most about the nodes *Diving, Mantas and Whale Sharks* and *Environmental Education* (Figure 5.13). They also mentioned the DTI as the most important driver of Tofo's economy and stated that the dive tourists come to Tofo primarily to see mantas and whale sharks. All owners interviewed rate healthy reefs as Very Important to the DTI and in turn the DTI as Very Important in creating jobs for the locals. Two of the dive center owners have been in Tofo more than nine years and give personal accounts of the decrease in species, especially manta rays, referring to the times when they could see 10-30 mantas per dive. The dive center owners placed great importance on environmental education towards locals, and especially those employed by them. They stated that local divers, once educated on marine issues, are more likely to be able to make a difference in the communities in terms of passing that knowledge forward. They also see the potential in educating children because they are the upcoming generation. The dive center owners talk about fishing impacts as well. They want to see the government crackdown on illegal fishing and want to see the locals being educated about better sustainable fishing methods and size restrictions. The dive center owners see the health of the reefs and the marine species as a big priority. They all advocated the designation of a marine protected area in Tofo as a way to achieve a healthy marine environment. They wanted everyone to be involved in it and that it be managed properly so that everyone will benefit from it.
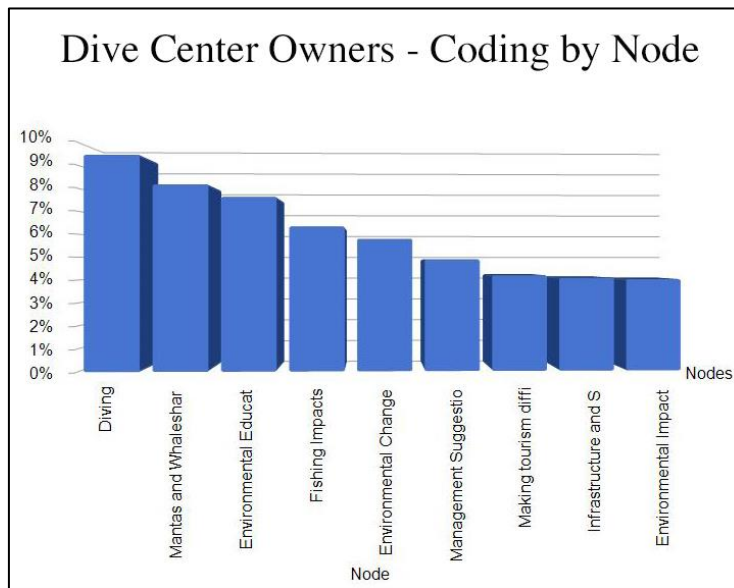
Figure 5.13 Most coded nodes for the Dive Center Owners stakeholder group

Wanting to give back to the community is another value that is visible through the owners' efforts in employing locals and teaching them environmental knowledge.

One of the dive center owners has been an active member of the Mozambique Divers Association (AMAR). The interview with him revealed that this organization has been inactive for the past 2 years. He recommended a meeting with the previous director. An interview with him was organized and the results of that conversation are discussed in the final chapter.

5.3.5 Dive Tourists

The most talked about nodes for dive tourists were *Diving, Diver Impacts and Environmental Protection* (Figure 5.14). The tourists were divided in their opinions on the main reasons to come to Tofo. For two, diving was the main reason for them to visit but not for the other two. Three of the tourists mentioned that Tofo is not solely a diving destination but also has surfing and beach life, but that diving is the main attraction. However, they all recognized that most of the infrastructure in Tofo is built to serve tourists. Following this, two of the tourists rated Q3, the importance of the DTI for employing locals, as Very Important.
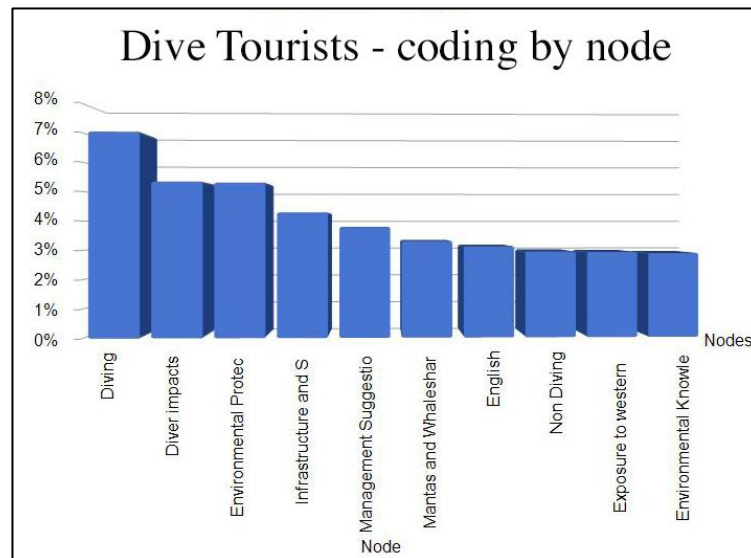
Figure 5.14 Most coded nodes for the Dive Tourists stakeholder group

Having *diver impacts* as the second most coded node indicates that the tourists understand the importance of low impact diving practices. They all commented about being cautious while diving so they avoid accidentally touching the reefs and cause them damage. All four tourists also answered Very Important to Q1 asking about the importance of healthy reefs to the dive tourism in Tofo. They see dive tourists as being more responsible than other tourists in their behavior and respect for the environment. One respondent even mentioned that after she started diving, she feels as though she has become an advocate of the oceans. The importance of conservation was deeply rooted in one of the tourists by her instructor when she first learnt to dive. She granted her instructors adamant conservation values for strongly influencing her and in turn making her more conservation oriented.

The dive tourists prioritized different things. Two saw the protection of mantas and whale sharks as a top priority, especially as they see the dive tourism in Tofo increasing in the next 5 years. This suggests conservation values. One of the tourists prioritized services and infrastructure, pointing out things that in his mind would improve the holistic tourism experience in Tofo such as, ATM, card paying facilities, airport shuttle etc.

Regarding values, three of the tourists commented about avoiding contact with reefs because they understood that such behavior could cause the reefs damage. Even giving

examples on how they have avoided touching the reefs in different situations and it seems that they portray deep feelings towards the conservation of the reefs.

5.3.6 Local Dive Center Staff

It becomes apparent by looking at the most coded nodes from the local dive center staff that their responses revolved around mostly different topics than the ones of other stakeholder groups. The most coded nodes were *Environmental Education, Education of Locals* and *Local Livelihoods* (Figure 5.15), while the main nodes for the previous stakeholder groups have been more around *Diving, Diver Impacts* and *Mantas and Whale Sharks.*
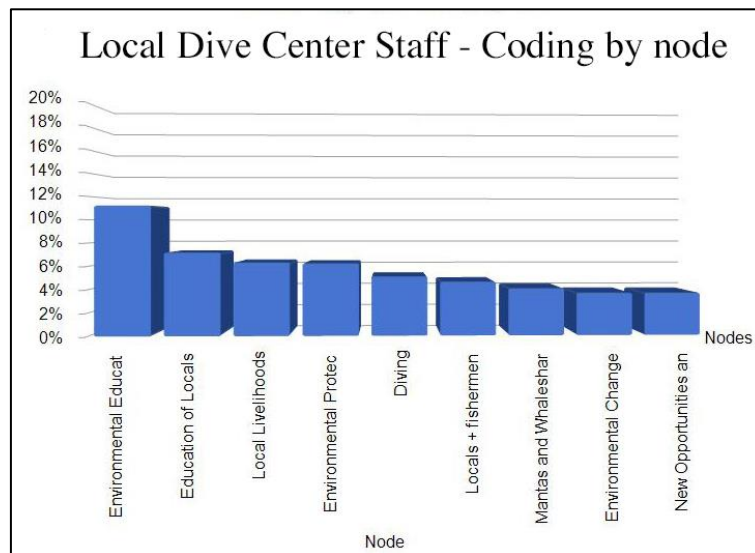
Figure 5.15 Most coded nodes for the Local Dive Center stakeholder group

The local dive center staff seem to understand the importance of the healthy reefs for the DTI and to the aggregation of marine species. Some of them have more than six years experience and could give personal accounts of times when they could see many more whale sharks and mantas than at present. They also recognized that the big marine species are the reason why tourist come to Tofo and would like to see them protected.

The discussion centered on the issue of local fishermen catching fish and sometimes more vulnerable species like turtles, mantas and sharks and even taking the reefs to sell to

76

tourists. They are viewed to do so because it is part of their livelihood and need to feed their families. In the local staffs' opinion, it is hard to tell someone to stop doing what he or she is doing, especially if it is his or her only source of income or food. For this, they want a solution where the locals can make a living without killing the animals. They think this can be done through environmental education of the locals as this can increase knowledge of locals in environmental issues and that could change their behavior and thus increase marine protection. The dive center staff openly believes it is the dive centers responsibility to provide this type of environmental education for locals and that would be *"good for marine protection".* They repetitively express the notion that they want the dive centers to contribute more to the communities and mention providing marine education for locals and children would be the best way. They give an example of a school close to the ocean where once a week children from surrounding communities can come and learn about the marine environment.

With regards to the dive center owners, the local staff had mostly negative things to say. Even though they value having a secure job in the dive industry, they feel that their employers are not appreciating them to the degree that they deserve:

> *"It's real important but how we are working, we work hard, and we are helping them, but they don't help us enough back. The dive industry brings tourists here but it doesn't benefit enough us, the local dive center staff."*

They believe that the dive centers pay higher salaries to foreign workers even though they do the same jobs as the locals. Although it was unclear what type of workers they meant by this.

5.3.7 Locals

The most coded nodes by the locals are seen above (Figure 5.16) with the top four being *Locals + Fishermen, Environmental Knowledge, Reef Vendors* and *Fishing Impacts.* The locals understand that most tourists come for the diving and that they want to see whale sharks and manta rays. All three respondents point out that dive tourists are very important to their business. Often after diving, the tourists will come down to the market and *"support"* the locals by buying different products. There is also indirect support, as the

spear fisherman points out, as he also sells his catch to restaurants, which wouldn't be there without dive tourism. They also say that without dive tourists or *"white people"* their
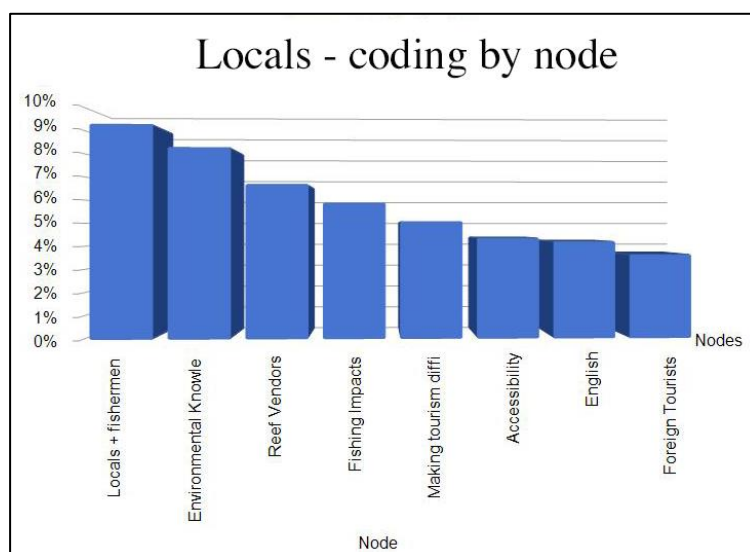
Figure 5.16 Most coded nodes for the Locals stakeholder group

livelihoods would be in danger and that "*things would be very bad"*.

The *Environmental Knowledge* and *Reef Vendors* nodes are also highly coded. However this comes from only one of the respondents, the spear fisherman. He was very knowledgeable about the marine environment, talking about the importance of reefs, or "*flowers",* as food for the fish and steeply judged the reef vendors who are *"killing our future"* by taking the corals and shells out of the ocean. He mentioned that the fish stocks seem to have diminished around Tofo and that they have to go further down the coast to catch fish these days. He was also versed on sustainable fishing practices and mentioned that the fishermen should not be taking out small fish or small crayfish because that too was *"killing our future".* This particular individual had positive views on the future and painted pictures of Tofo becoming a paradise referring to the number of tourists visiting and the development of infrastructure.

The other two respondents did not display the same level of environmental knowledge. In their case, both mentioned the past political instability as an important factor in how many tourists come to Tofo. The market merchant was also more pessimistic in his views of the future than the spear fisherman, saying that there will be a lack of jobs in the future as he thinks tourism will decrease.

5.3.8 Conservation NGOs

The most coded nodes for the Conservation NGOs were *Diving, Mantas and Whale Sharks* and *Non Diving* (Figure 5.17). The NGO scientist interviewed shared the views of the other stakeholders in that dive tourists come to Tofo mainly to see mantas and whale sharks. He brought to light a yet unpublished study that demonstrates 70-80% of divers come to Tofo specifically to see the whale sharks and manta rays. He says that the DTI is important to the locals because the primary reason tourists come there is to dive, but also shares the views of the dive tourists that Tofo is more than just a dive destination referring to the surfing and nightlife. The scientist paints a dark future for Tofo if the whale sharks and manta rays disappear, thinking the dive industry would slowly seize to exist. He believes that some form of protection should be present in Tofo, whether it is a community managed protected area or an eco park. He sees potential in both and stated that in either case, stakeholder engagement would be an important element for its success. He also pointed to the great potential in the younger generation as part of MMFs work is teaching local children to swim. Some of these children, he points out, look up to the locals working for MMF and see new opportunities in similar fields. He recognized the negative impacts from diving on some of the more frequently visited reefs and suggested rest periods for some areas to allow the reefs to recover.
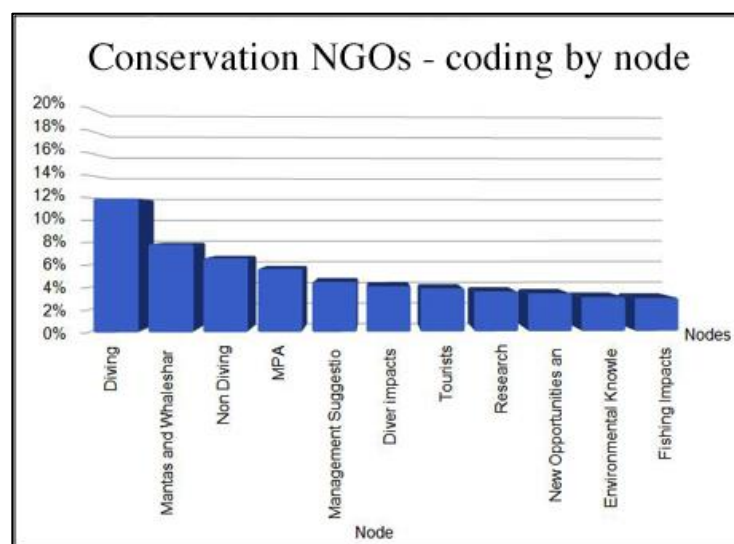
Figure 5.17 Most coded nodes for the Conservation NGOs stakeholder group

5.3.9 Restaurants

The Restaurant stakeholder group code most references in *Non Diving, Environmental Change* and *Mantas and Whale Sharks* (Figure 5.18). The one restaurant owner interviewed is a local who was born close to Tofo and had experience working in dive centers and restaurants before opening her own restaurant. She acknowledges the importance of tourists for the livelihoods of the locals including her own. She perceives the reefs as not being healthy at the moment because the fishermen are catching less fish. She thinks that tourism has decreased over the years since she has been in Tofo and believes it is because tourists have been having bad experiences when they have not seen whale sharks and manta rays and they have told about these bad experiences to their friends. When asked about her relationships to the fishermen, she stated that she has been buying fish from the same people her whole life. This would suggest, that even if the fishermen were fishing unsustainably, she prioritizes family or friendship relationships over sustainable fishing.
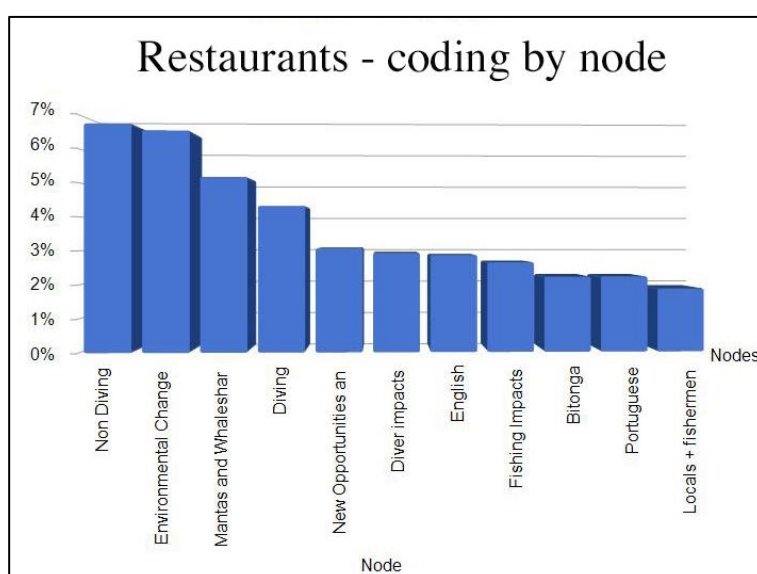
Figure 5.18 Most coded nodes for the Restaurants stakeholder group

6 Discussion and conclusions

6.1 Key findings of the study

6.1.1 Importance of the DTI to the economy of Tofo

The development of the dive tourism industry is perceived to be the major driver of infrastructure and economic development in Tofo. Most infrastructures in Tofo: hotels, restaurants, lodges or shops would not be sustained without the influx of tourists that predominantly come to Tofo for the diving. The DTI has given the local people new livelihood opportunities, which include working for the dive centers, restaurants, and hotels or being self-employed in the market area. All stakeholders identified that the particular lure for dive tourists to come to Tofo is to see the famous marine mega fauna species.

The diving industry is the main economic driver of Tofo. This comes as no surprise as Tofo is located in an area without other large tourism clusters nearby. Looking at Tofo within the Mozambican scale, it is a tiny town on a very long coastline. The fact that Tofo has such abundant marine mega fauna species, namely manta rays and whale sharks has put it on the world map as a scuba diving destination. It is comparable to places like Koh Tao in Thailand, or the Hurghada in Egypt that are famous dive destinations, but unlike Tofo, these offer a variety of other tourism services as well. These types of destinations could potentially bounce back from a downturn in the dive tourism sector because of all the other services offered. In contrast, in Tofo, dive tourism is clearly the most important economic sector and its decline would have significant impacts to its economy and the livelihoods that depend on it. This highlights the importance to protect the marine species and the reefs.

6.1.2 Tackling diver and fishing impacts

Regarding the use of coral reefs, the respondents perceived two primary uses: diving and fishing. Coral reefs are the main attraction where scuba diving takes place in Tofo. It is also the most productive place for fishermen to catch fish. There were clear opinions that both these activities impact the reefs, but also the species that live on the reefs. While a few respondents did not think diving causes impacts on reefs, the majority of the respondents identified damage to reefs through diver contact and disruption to species behavior by diver presence. An example was given of manta rays that might be scared away from their cleaning stations if divers are present. This comes as no surprise as diver impacts to reefs and marine species have been documented in numerous studies from around the globe (e.g., Hawkins & Roberts, 1992; Zakai & Chadwick-Furman, 2002)

Few respondents commented on fishing impacts, but those that did identified fishing to cause direct impacts to reefs by breaking the reefs if the nets get stuck, but also to cause impacts to species populations, especially untargeted species. There were no comments referring to diving and fishing activities being in competition with each other or that they take place on the same reef at the same time.

There was clear negativity towards fishing impacts on the reefs and marine species vocalized by dive center owners, dive instructors, the NGO scientist and even one local. Although diver impacts on reefs were identified by the same stakeholders and talked about more than fishing impacts, the reactions weren't as hostile as those towards fishing impacts. This is an interesting result and could reveal hostility between the divers and fishermen. Then again one of the dive center owners said that over the years the dialogue between dive centers and fishermen has grown and is now rather good. It could also have to do with a denial of diver impacts as important because most people interviewed work directly in the diving industry.

Not surprisingly, stakeholders directly in contact with the marine environment – dive instructors, dive masters, dive center owners – speak the most about diver impacts, mantas and whale sharks and reveal strong interest in the protection of the marine environment. These are the individuals that witness diver impacts on the reefs with their own eyes. While the impacts on the reefs can be seen by both dive masters and instructors, only the instructors can see the long term effect on the reefs of Tofo since they are in the area

longer compared to dive masters who often only stay for the duration of their dive master internship (3-6 months). Similarly, two of the dive center owners who have been in Tofo for over nine years gave personal accounts on the changes in the marine environment. It is evident that the dive centers owners want to conserve the reefs and marine species in Tofo. This may indicate conservation values, just as much as it may mean they might want to keep the reefs healthy to sustain their livelihoods from dive tourism. The motives don't really matter as long as the end result is the same: the protection of the marine resources.

Neither locals nor fishermen mentioned diving or fishing impacts. This may be due to the fact that they cannot see the impact themselves. Hardly any of the fishermen can swim and many of the locals have never had the chance to go diving or snorkeling. Here the age-old saying 'out of sight, out of mind' seems to apply. This view is supported by the interviewed spear fisherman who spends his time diving under the surface to catch his fish and gave personal accounts on the changes to the reefs and fish abundance that he has witnessed.

The positive results are that most of the stakeholders identified these impacts as opposed to denying them. This represents a good start for those issues to be addressed in the future. If the stakeholders had not acknowledged the impacts, it would be harder to try and implement any management suggestions. One suggestion to consider would be to plan an excursion with locals to see the differences in healthy reefs and broken reefs and consequent fish numbers.

Another positive aspect for the DTI in Tofo is the small scale of the diving sector. Compared with other popular dive sites in the world, Tofo is still very small scale with only four dive centers with between 2-3 boats in each shop. Diver impact studies have on average proposed 5000-6000 dives per dive site per year to be the carrying capacity of coral reefs for SCUBA diving (Harriott et al., 1997; Hawkins et al., 1999). Although, this study didn't quantify the average number of divers per Tofo's dive sites, we can predict it would be less than 5000 per site per year. Perhaps the amount of diving taking place annually at Tofo's most popular dive sites like Manta Reef and Giants Castle might be closer to the average proposed above. One of the dive instructors and dive center owners wished that the scale of the dive industry in Tofo stayed small so divers can enjoy the

uncrowded reefs. This corresponds with what Haddock-Fraser & Hampton (2010) found in a similar study with dive instructors and owners and stating that this finding is unsurprising given that the quality of diving depends on working with the carrying capacity and that increased number of tourists would negatively affect the charm of a dive destination.

6.1.3 Need for more environmental education

Some stakeholders associated the undesired behavior of locals (bad fishing practices, selling reefs as souvenirs etc.) to a lack in environmental awareness. Many expressed the need for more environmental education for the locals as a way to advance the sustainability of the DTI in Tofo. They stressed especially the effect that environmental education can have for the next generation or children. The link between environmental education and raised awareness and conservation efforts in children has been revealed in a few studies. Martin et al. (2015) showed that children that attended the Garbage in the Water program had increased knowledge about sea turtles and the threats of marine debris. Hartley et al. (2015) found that a education about marine litter directed to children resulted in the children being more concerned, increased understanding about the causes and negative impacts of litter and resulted in engagement in actions to reduce the causes of marine litter.

In Tofo, at least the MMF is engaging in community education programs to do exactly this, educate the children about marine issues. The opinion of the local dive center staff was that the dive centers should also play a role by creating some form of education for the locals in Tofo. This is partly because the dive centers staff feels that the dive centers have not been contributing enough to Tofo's well being.

The education doesn't need to stop with the locals. The dive centers have a great opportunity to also influence the perspectives and awareness of the dive tourists especially before and during the ocean safari trips. Such marine wildlife tours can provide a range of education and awareness benefits for visitors, including emotional responses and learning contributing to on-site behavioral changes and longer-term inspiration to engage in marine conservation actions (Zeppel, 2008). Thus, the results from this thesis suggest that more collaboration is needed between dive centers and the conservation NGOs to provide

training for the instructors and dive masters in marine education for the benefit of the tourists.

6.1.4 The unheard voices of the Local Dive Center Staff

The most interesting results arose from the focus group meeting with the local dive staff. It was noted several times that the dive staff often avoided the question that was asked and changed the discussion towards issues that they obviously wanted to bring to the table. The main topics of discussions were their dissatisfaction towards the owners of the dive center, their importance to the functioning of dive centers and their desire for the dive centers to give back more to the community either through higher salaries or by providing education opportunities. It seems like the dive center local staff want recognition for their role and want their voices to be heard. Perhaps they saw this focus group meeting as an opportunity to do that.

The enthusiasm of the local staff towards the meeting was evident from the number of participants that took part. Only two representatives per dive center were asked to take part and the expectation of the author was that one participant from each dive center would actually arrive to the meeting. As it turned out, two came from three dive centers and three came from the other, compared with the dive master focus group meeting where there were two representatives from two centers and only one representative from the other two. This was obviously an important meeting for the local dive staff. Participants were offered a small remuneration for taking part in the meeting, but one participant kindly refused the payment after the meeting giving the author the feeling that most of the participants would have taken part even without it.

The local staff seems confused and angry that foreigners who come to the dive centers and do the same or lesser jobs as them are getting paid more than they are. Whether or not this is the case was not investigated in this research. However, if this is not the case, it is a topic that needs to be further explored with the local dive center staff to clear any misunderstandings. The dive center staff also would like higher salaries because they

perceive themselves as very hard workers and the ones that keep the dive centers running. It takes a team to make a dive center work, but it is true that without captains or mechanics, the boats would not be going out.

The dive center staff wanted to see more environmental education opportunities for the locals and especially the children. They feel strongly that it is the dive centers responsibility to set up and provide education opportunities for the locals. This indicates that the dive center staff prioritizes environmental education since they recognize the link between education and protection of the environment. Their values are strong towards protection and also towards the next generation comprised of their children.

6.2 Influence of the design of the research on the findings

To ensure reliability of this thesis, the influence of the design of the research and the questions used for the data gathering on the findings of this thesis needs to be considered. To find out the most prominent themes discussed by the respondents, thematic nodes were organized in order of most coded references. The most coded parent themes in order were *Natural Environment, Economy, Social, Management Suggestions* and *Dive Tourism Industry* respectively. Table 6.1 illustrates in which interview questions most of the references to each of these themes was made.

Table 6.1 Proportion of references of the five most coded nodes to the interview questions

	Natural Environment	Economy	Social	Management Suggestions	DTI
Q1	14 %	11 %	1 %	1 %	8 %
Q2	18 %	2 %	4 %	11 %	10 %
Q3	3 %	31 %	11 %	1 %	13 %
Q4	15 %	9 %	10 %	5 %	10 %
Q5	0 %	4 %	42 %	0 %	5 %
Q6	26 %	22 %	11 %	29 %	22 %
Q7	23 %	20 %	22 %	54 %	33 %

Certain interview questions (Table 4.3) are naturally more geared to contributing to a certain theme or node. This can be seen for example in the Management Suggestions node that was mostly coded in Q7 that specially asks for management suggestions. Likewise, the

Economy and *Social* nodes were most coded in the corresponding questions Q3 and Q5. The question here is whether the interview questions as a whole have a bias towards favoring a specific theme or not.

The main sustainability indicator nodes are Environment, Economy and Social. While all of these have a question that provided the most references (indicated by highest percentage), they were all referenced to in all of the interview questions, with the exception of natural environment and Q5. This would suggest that there is no bias of the interview questions towards favoring any of the main sustainability nodes. On the contrary, because they were all referenced so frequently in all questions the findings of main themes in the results section remains valid. Natural environment was the most coded parent node and it wasn't referenced to at all in Q5, indicating that the highest coded nodes are not due to question design but probably because they were the topics that the respondents were most concerned about.

An interesting thought is, whether other major themes might have surfaced if the questions were different? In the scope of this thesis, the final questions are thought to be valid and to have effectively helped answer the research questions. The questions already managed to uncover other themes that were not explicitly asked for. Such emergent themes were apparent in the nodes of *manta rays & whale sharks, Government, Education & Environmental Education, Cooperation of dive centers* and *South African Tourists*. The emergence of such themes gives the interview questions as well as those nodes more credibility as they emerged without direct inquisition and were mentioned by multiple respondents.

Some invalid representations came to light from using the percentage coverage of coded references. Although this was justified over the number of coded references as explained in the data analysis chapter (4.5.2), it gave an unrealistic representation of one stakeholder group: the *local*s. According to the percentage coverage, the most talked about theme was environmental knowledge. Just by looking at the graph the reader might think that the locals have great environmental knowledge, when in reality it was just the one respondent from that stakeholder group, the spear fisherman, who extensively described environmental knowledge. The fact that this respondent coded such a large percentage to this node skews

the whole stakeholder groups' representation. What magnified this further, and why it wasn't seen so much in other stakeholder groups, was the fact that the interviews with the locals were significantly shorter than those of other stakeholders. This was due to language limitations, as the author believed not all the locals quite grasped the meaning of the questions and couldn't express themselves entirely in English.

6.3 Particular limitations and strengths of the study

As the author spent five months in Tofo for the data gathering of this thesis, he became acquainted with some of the respondents of this study prior to the interview situation. This could have lead to a circumstance where the respondents' answers were influenced by the fact that they knew him beforehand. However, the general feeling the author had after the data gathering was finished was one of full trust and openness with the respondents. He felt that the respondents were not keeping things to themselves based on knowing the author beforehand. This can be due to a lack of highly sensitive issues touched in this thesis. And while this might be the feeling the author senses, it is not conclusive in whether the responses were influenced or not.

Some limitations were apparent in the local dive staff focus group meeting. As the primary language of the meeting was in Portuguese, it was hard for the author to fully grasp what was being talked about in each instance, despite the brief translations provided by the assistant facilitator. It is therefore possible that some comments or quotes would have triggered deeper probes had the author fully understood what was being talked about. It became evident in both focus group meetings that there are certain respondents that had more to say than others. The more silent ones were encouraged to participate when it was sensed that they were not taking part in the conversations. This worked with the dive masters but with the local dive center staff there were still two participants that hardly said anything in the whole meeting. Part of the problem with that meeting was due to the language barrier, which restricted the author from fully embracing the participants.

Another limitation was the way that some respondents were chosen from the population. Although the sampling was mostly purposive, in some cases it came down to convenience: who wanted to participate and had time. According to Anderson (2010), convenience based sampling is fine for exploratory studies but might be biased and non-representative of the

population in question. Whether this study was exploratory in nature or not is yet to be decided. On one hand, this study aimed to find out stakeholder perspectives, priorities and values and use those findings to suggest management suggestions, which would deem it non-exploratory. But on the other hand, this is a master's thesis, which by nature is exploratory. It is better therefore to try and determine whether the respondents in this study were representative of the population or not. It is the belief of the author that the respondents were representative of the population in the following groups: dive center owners, dive instructors, dive masters, dive center local staff, accommodation and conservation NGOs, because there are not many stakeholders in those categories, and this study included a good percentage of them and included respondents from all dive centers. Four out of six dive center owners were interviewed (67%); on average there are two dive instructors per dive center in Tofo so ~ 50% of instructors were interviewed; at the time, there were nine dive masters in Tofo so 67% of dive masters took part in the focus group meeting. There are about six local staff in each dive center so ~ 37% of them took part in the focus group meeting. On the other hand, the restaurants and local people stakeholder groups might not be so representative. Only one restaurant owner was interviewed. There are around 20 restaurants in Tofo so to get a representative amount perhaps four restaurants should have been interviewed. There are a large number of local people who work in Tofo (population unknown) and random sampling might have been appropriate, however due to the fact that most locals don't speak English proficiently, the sampling was based on convenience. In conclusion, the views expressed by the respondents in the restaurant and local people stakeholder groups for this thesis are not seen as a representative sample of the population.

Out of the 34 respondents in this research only seven (21%) were female. There are very few local females working in the dive centers and zero of those work as part of the local dive center staff considered in this thesis, or in any dive related job such as a dive master or an instructor. It is unknown why this is the case, whether it is a cultural issue: maybe the women don't see the dive industry as a desirable option, or perhaps they are not allowed to work in such a field. There are foreign female dive masters and instructors in every dive center in Tofo, yet the author did not particularly seek out an equal number of males and females for the responses in those stakeholder groups, but once again it came down to convenience of those people. And it just happened that the male representatives in those

stakeholder groups were more available to participate. Females were also not interviewed for the Local – stakeholder group that was due to them not really speaking English. In Tofo, women are mainly employed as vegetable sales people, restaurant employees, chefs or kiosk vendors. All other jobs such as fisherman, market stall salesman, tailors, general vendors are largely male populated. Having had at least one local female to interview would have probably made this study stronger, but organizing one was difficult since close to none of the local females that the author met during this study spoke English.

Due to resource and time limitations, a complete stakeholder analysis could not be completed for this thesis. What were left out of a full stakeholder analysis were a more thorough stakeholder identification exercise and a network analysis that would investigate the interrelations between stakeholders. Stakeholder identification was done solely through literature review of relevant studies. A more in-depth stakeholder identification in Tofo could have the potential to reveal other stakeholder groups that might play an important role in the SDTS in Tofo. Investigating the interrelations of stakeholders could uncover central stakeholder groups and power relations between groups, which would be very useful in the creation and implementation of a community based management plan.

Strength of a qualitative study is portrayed if it is transferable to another setting (Anderson, 2010). This study was designed to be transferable to another dive tourism location. The interview questions proved to be appropriate and useful in finding out stakeholder perspectives on major themes, as well as to uncover new themes. The interview and focus group approach worked better than expected and managed to show differences in the most prominent discussion topics across stakeholder groups. Allowing more time and resources, the sample sizes could be increased for a more valid representation of the populations in the study area. Finally, all stakeholder groups should be covered with either interviews or focus group meetings, or both, as they are complementary and reveal somewhat different perspectives on the topic (Kaplowitz & Hoehn, 2001).

Anderson (2010) also suggests that study findings are valid if the conclusion is comprehensible to a thoughtful participant in the setting. Due to the straightforward analysis of the data and lack of technical terminology, the conclusions of this thesis would be comprehensible to a thoughtful participant in Tofo.

6.4 Management suggestions and concluding remarks

The goal of this thesis was to contribute towards sustainable dive tourism management in Praia do Tofo exploring the perspectives, priorities and values of selected key stakeholders on the use of coral reefs and development of the DTI and assessing the perceived importance of the DTI to the local economy and livelihoods in Tofo. The results showed that the DTI is perceived as the most important driver of Tofo's economy and the main attraction for the influx of dive tourists is the marine mega fauna, most noticeably whale sharks and manta rays. The main perceived impacts to reefs and marine species are derived from diver and fishing impacts. The study uncovered conservation needs as expressed by the stakeholder groups, requests for environmental education of locals, concerns relating to political instability and lack of governmental conservation efforts, and brought to light the apparent dissatisfaction of the local dive center staff regarding a lack of recognition of the importance of their role.

Given the time constrains and lack of resources available for the field portion of the thesis, the study managed to meet the desired outcomes. Had there been more time, the samples of each stakeholder group would be larger and more effort would be put to breach the language barrier between the author and the locals. If this research is continued, the stakeholder interrelations should be investigated more thoroughly. This subject was touched on a few occasions but a more conclusive analysis is recommended for example in the form of a Social Network Analysis (SNA). This has the potential to uncover central stakeholder groups and power relations between them. Further research building on the findings of this thesis would be to conduct a more thorough stakeholder analysis to find out stakeholder perceptions and desires on the type of environmental protection plan, including bringing all the stakeholders together and formulating an integrated management plan. A separate study should look at annual diver frequency to the dive sites in Tofo. To the authors knowledge this has not yet been done, but is deemed necessary to support some of the management suggestions provided in this thesis.

The following sequence describes the current situation in Tofo: Tourism is important to the livelihoods of all people in Tofo. Tourists come to Tofo primarily for the diving and especially to see two famous mega fauna species: manta rays and whale sharks. This leads

to the assumption that a decrease in the presence of these two marine species in the waters off Tofo would negatively affect the dive tourism industry. Already whale shark and manta ray sightings have decreased over the past 10 years, as evidenced by both scientific literature and personal anecdotal observations by residents in Tofo.

Considering the decline in manta ray and whale shark numbers over the years, either new tourist attractions need to be developed or the marine environment need to be protected in order to sustain the livelihoods of the people in Tofo. Given the lack of alternative options readily available in Tofo, the more prominent option is to protect what makes Tofo so desirable to tourists at the moment: the reefs, manta rays and whale sharks. All stakeholders interviewed understood the importance of these two species to the economy of Tofo, yet respondents from only four out of the nine stakeholder groups suggested they should be protected. This could be the result of stakeholders not having strong conservation awareness, or not being informed about available marine protection measures.

The objectives of protecting natural resources such as those present in Tofo should be both to sustain livelihoods and ensure environmental protection. Different types of diving related solutions have been suggested in areas where coral reefs are degrading. These include direct supervision of dive tourists underwater (Barker & Roberts, 2004), matching diver competence and site preferences (Worachananant et al., 2008), artificial reefs (Baine, 2001) and teaching low-impact recreational practices (Hunt et al., 2013).). All these type of solutions can be categorized as micro management, because they are solutions that reef users such as dive operators can implement. In addition to such micro management solutions, larger legal protective measures can be implemented. The most favored management tool that has emerged to reduce coral degradation and protect marine species is Marine Protected Areas (MPAs) (Lück, 2007).

Based on the research conducted for this thesis, three management suggestions are provided. They are presented as: 1) *Micro Management - 2) Dive center Collaborative Measures, Resurrect AMAR* and 3) *Establish an MPA*.

6.4.1 Micro Management - Dive center collaborative measures

Give the reefs a break and find new dive sites during quiet months

It is imperative to know the diver frequency at each dive site in Tofo. It is being proposed that all dive centers keep a daily record on how many divers go out each day and to which dive sites for the duration of a year. After which, average annual dive site visitation could be estimated. This information would allow to rate dive sites according to visitation frequency. Multiple suggestions were mentioned by the respondents in this study that can be implemented by the dive centers in a short time span. One thing that many pointed out is that some reefs need to be closed off to diving in order to allow them to recover. Knowing visitation frequency would allow dive centers to make collective decisions on which reefs to close off, for how long and at what times of the year.

Another alternative is looking for new dive sites to reduce pressure on current reefs under excessive use. It is understandable that during high season, demand is higher for the more renowned reefs such as Manta Reef and Giants Castle. However, during low season, these reefs could be left alone to let them regenerate and minimize disturbance to fish species. During the busy high season, time is limited to go out looking for new dive sites therefore this activity should be undertaken during low season. According to one of the dive center owners the quietest months in terms of dive tourism are April and May.

Looking for new dive sites needs to be done in collaboration with all the dive centers so as to eliminate any mistrust and secrecy around new sites. This was something that was mentioned by a few of the dive center owners. This thesis proposes that a search squad be created, consisting of at least 1 dive instructor of each dive center, one employee of a conservation NGO and those owners of the dive centers that have time to take part in the search. This search squad would use one of the dive centers' more reliable boats and head out together to look for new dive sites. Costs of the search effort would be equally divided by all four of the dive centers and coordinates for the new sites would be shared amongst all the dive centers.

Artificial Reef and wreck diving

A few interesting suggestions were also mentioned by one tourist. It was suggested that an artificial reef or wreck could help take pressure away from the current dive sites and could

also reduce diver impacts, if for example these artificial reefs were primarily used to take beginner divers.

Increased environmental education of instructors and dive masters

One tourist said that her first certification level instructor had strong values on conservation, which has hugely influenced her own views on conservation. This type of role model can be a strong influence and it is suggested that at least all dive master trainees (DMTs) in Tofo should not only learn about diving but also about the local marine environment. The MMF offers free access to all DMTs to their three weekly lectures on marine life. It is suggested that dive center owners should make it compulsory for the training of the DMTs to attend each lecture as part of their certification. Once the DMTs and instructors acquire more knowledge about the marine environment in Tofo, they will have an opportunity to affect the dive tourists through environmental education both before and during the ocean safari expeditions.

Confer with the local dive center staff

The needs of the local dive center staff must be brought to the table. The dive center staffs call out for higher salaries and environmental education opportunities for the locals, especially the children. Discussing salary increases or any labor dispute issues goes beyond the scope of this thesis. However, it is thought that addressing the request of the dive center staff for more environmental education opportunities would go a long way in restoring the trust and respect of the local staff towards the dive center owners.

Many respondents called out the need for more environmental education opportunities for locals. The dive center local staff believes the dive centers as responsible for implementing some sort of weekly education session for locals so they can learn more about the marine environment that all the stakeholders share. This is something that the dive center owners and staff, together with resident scientists, should discuss further as education programs have been shown to increase awareness and conservation efforts in children (Hartley et.al., 2015; Martin et.al. 2015).

6.4.2 Resurrect AMAR

The Divers Association of Mozambique (AMAR) is a non-profit organization with the goal to conserve and protect the marine resources and sustainable development of the dive

tourism in Mozambique. Founded in 2006, the organization was active until 2014 after the funds from the German Development Cooperation ended. The Director of Operations of the organization was interviewed in an additional meeting to discuss AMAR.

One major success that AMAR experienced was facilitating the dialogue between the private and public sector. Dialogue between the dive centers and governmental bodies were established in a way where AMAR could influence decision-making. This was most evident when AMAR was accepted as a permanent member of the Confederation of Economic Associations of Mozambique (CTA), which is the official partner of dialogue with the government, in the private sector representation and working towards a better business environment in Mozambique, through promotion of economic and regulatory reforms.

During the interview the Director portrayed disappointment in that AMAR didn't experience a lot of success in the projects it embarked on. The reasons given were because the governmental bodies didn't act on AMAR's suggestions, for example on the new dive operations regulations and laws. Another reason AMAR wasn't gaining enough momentum was because the dive centers in Barra and Tofo were not working collaboratively at the time. The cooperation between the dive centers, especially in Tofo, has changed radically since that time. As evidence by this thesis, the time is right to capitalize on the current amiable relationship between the dive centers in Tofo and resurrect AMAR in some form or shape.

Some of AMAR's original functions have been taken over by other organizations. The marine conservation role has now become MMF's responsibility, and teaching of local divers has become a Bitonga Divers role, while all dive centers are doing their own training of locals to become dive masters. However, there is still a gap that a new version of AMAR could fulfill. One item that all dive center owners complained about is the emergence of new laws and regulations that are hard to figure out. A new AMAR could take on the role to inform the dive centers of governmental changes, including new laws and regulations. Moreover, the new role of AMAR would also be to bring the dive centers' interests to the government and influence decision-making and policy directions.

Resurrecting AMAR is a better idea than creating a whole new organization because AMAR maintains those connections to the government through the CTA.

6.4.3 Establish an MPA

Publications suggest that MPAs are a useful tool to reduce coral degradation and protect marine species (Lück, 2007). It is therefore important that some form of marine protection be established around the Tofo, Inhambane area. While this idea is not new and was even close to fruition when AMAR was still active, including attempts by MMF and Bitonga divers, it has yet to be implemented. It almost seems that a more concentrated effort needs to done. This might mean establishing a whole new body to try and push it through, or if AMAR can be reactivated, they could concentrate their full efforts on the establishment of an MPA. In either case, the organization would need to consist of locals with a vested interest in the subject, and an individual leader who knows how the government works and knows how it could be done. Stakeholder engagement must a key approach, with multiple workshops held where the opinions of all stakeholders would be taken into account. Essentially all stakeholders must buy into the idea of protection otherwise it will not work. Fortunately, the importance of manta rays and whale sharks for the economy of Tofo is recognized by almost all the stakeholders interviewed, so that can be used as a powerful message in emphasizing the importance of protection to those still skeptical about it.

If the problem lies in a lack of government commitment for an MPA solution, the alternative of self-regulation or voluntary management strategy and a community oriented protected area approach are recommended. This would translate to some form of community-based managed protected area. The willingness of dive operators in conducting conservation and tourism management efforts, together with the community members and scientists, can fill the void if government fails to address it. This would require full commitment by the locals, which based on the perceptions of the respondents in this study, would be a hard task because it is difficult to change people's ways.

6.5 Future of marine protection in Tofo

Protection of the oceans is a challenging task often involving multiple stakeholders and efficient managers. SCUBA diving has allowed us humans, terrestrial creatures, access to

the living room of weird and wonderful creatures that call the oceans their home. SCUBA divers and dive locations around the world have a chance to sustain the long term scuba diving industry, both through protecting livelihoods of those involved in the diving industry as well as the species and marine environments where the diving takes place.

The decrease in sightings of manta rays and whale sharks, as well as degradation of the coral reefs in Praia do Tofo has sparked a movement towards the protection of these marine resources. What is lacking in Tofo is a more concentrated movement from an individual or organization to push in a bottom-up approach to influence the government in the implementation of a marine protected area. To achieve this, further collaboration between the different conservation organizations and the dive centers needs to happen. The findings of this thesis support the idea that the stakeholders of the diving industry in Tofo acknowledge the importance and role that the marine resources play in the economy and livelihoods of the people in Tofo. The notions of giving the reefs rest periods through partial breaks, as well as searching for new dive sites and establishing a marine protected area seem widely accepted within the different stakeholder groups. Increased collaboration between dive shops over the past year and a half has paved the way for further collaboration in this front. The author hopes that this thesis can stimulate the stakeholders of the SDTS in Tofo to collaboratively protect their natural resources, secure their livelihoods and save a piece of the beauty of the ocean to the future generations.

References

Anderson, C. (2010). Presenting and Evaluating Qualitative Research. *American Journal of Pharmaceutical Education*, 74(8), 141.

Baine, M. (2001). Artificial reefs: a review of their design, application, management and performance. *Ocean & Coastal Management*, *44*(3), 241-259.

Barker, N. H., & Roberts, C. M. (2004). Scuba diver behaviour and the management of diving impacts on coral reefs. *Biological Conservation*, 120(4), 481-489.

Bennet, M. (2003). Scuba diving tourism in Phuket, Thailand, pursuing sustainability. *Ph.D. dissertation, University of Victoria, Canada.*

Brugha, R., Varvasovsky, Z., 2000. Stakeholder analysis: a review. *Health Policy and Planning* 15, 239–246.

Burke, L. M., Maidens, J., Spalding, M., Kramer, P., & Green, E. (2004). *Reefs at Risk in the Caribbean* (pp. 1-80). Washington, DC: World Resources Institute.

Camp, E., & Fraser, D. (2012). Influence of conservation education dive briefings as a management tool on the timing and nature of recreational SCUBA diving impacts on coral reefs. *Ocean & Coastal Management*, *61*, 30-37.

Carpenter, K. E., Abrar, M., Aeby, G., Aronson, R. B., Banks, S., Bruckner, A., ... & Edgar, G. J. (2008). One-third of reef-building corals face elevated extinction risk from climate change and local impacts. *Science*, *321*(5888), 560-563.

CIA Mozambique - World Fact Book. (n.d.). Retrieved January 14, 2016, from https://www.cia.gov/library/publications/the-world-factbook/geos/mz.html

COAST (2014). Collaborative actions for sustainable tourism (COAST) project: Reef and marine recreation management (RMRM) thematic area – Mozambique. Towards Sustainable Marine Tourism in Tofo, Barra & Tofinho. *Version 1 2014 – 2019*.

Davis, D., & Tisdell, C. (1995). Recreational scuba-diving and carrying capacity in marine protected areas. *Ocean & Coastal Management*, 26(1), 19-40.

Dignan, D. (1990, March 26). SCUBA gaining among mainstream travelers. *Tour and Travel News, 1*, 44–45.

Dimmock, K (2007). 'Scuba diving, snorkeling and free diving', in G Jennings (ed.), *Water-based tourism, sport, leisure, and recreation experiences*, Butterworth-Heinemann, Burlington, MA, pp. 128-148. ISBN: 9780750661812

Dimmock, K & Musa, G. (2015). Scuba diving tourism system: a framework for collaborative management and sustainability, *Marine Policy,* vol. 54, pp. 52- 58

Freeman, R. E. (1984) Strategic Management: A Stakeholder Approach. Pitman. Boston, MA.

Gill, D. A., Schuhmann, P. W., & Oxenford, H. A. (2015). Recreational diver preferences for reef fish attributes: Economic implications of future change. *Ecological Economics*, *111*, 48-57.

Haddock-Fraser, J., & Hampton, M. P. (2012). Multistakeholder values on the sustainability of dive tourism: case studies of Sipadan and Perhentian Islands, Malaysia. *Tourism Analysis*, 17(1), 27-41.

Harriott, V. J., Davis, D., & Banks, S. A. (1997). Recreational diving and its impact in marine protected areas in eastern Australia. *Ambio*, 173-179.

Hartley, B. L., Thompson, R. C., & Pahl, S. (2015). Marine litter education boosts children's understanding and self-reported actions. *Marine pollution bulletin*, 90(1), 209-217.

Haselberger, D. (2015). Transcriptions [Computer Software]

Hawkins, J. P., & Roberts, C. M. (1992). Effects of recreational SCUBA diving on fore-reef slope communities of coral reefs. *Biological Conservation*, 62(3), 171-178.

Hawkins, J. P., Roberts, C. M., Van'T Hof, T., De Meyer, K., Tratalos, J., & Aldam, C. (1999). Effects of recreational scuba diving on Caribbean coral and fish communities. *Conservation Biology*, *13*(4), 888-897.

Hillmer-Pegram, K. C. (2014). Understanding the resilience of dive tourism to complex change. *Tourism Geographies*, *16*(4), 598-614.

Hunt, C. V., Harvey, J. J., Miller, A., Johnson, V., & Phongsuwan, N. (2013). The Green Fins approach for monitoring and promoting environmentally sustainable scuba diving operations in South East Asia. *Ocean & Coastal Management*, *78*, 35-44.

Jennings, S., & Polunin, N. V. (1996). Impacts of fishing on tropical reef ecosystems. *Ambio*, 44-49.

Kaplowitz, M. D., & Hoehn, J. P. (2001). Do focus groups and individual interviews reveal the same information for natural resource valuation?. *Ecological Economics*, 36(2), 237-247.

Kitzinger, J. (1994). The methodology of focus groups: the importance of interaction between research participants. *Sociology of health and illness*, 16(1), 103-121.

Kitzinger, J. (1995). Qualitative research. Introducing focus groups. BMJ*: British medical journal*, 311(7000), 299.

Longhurst, R. (2003). Semi-structured interviews and focus groups. *Key methods in geography*, 117-132.

Lucrezi, S., Saayman, M., & van der Merwe, P. (2013). Managing diving impacts on reef ecosystems: Analysis of putative influences of motivations, marine life preferences and experience on divers' environmental perceptions. *Ocean & Coastal Management*, 76, 52-63.

Lück, M. (2007). Managing marine wildlife experiences: The role of visitor interpretation programmes. *Marine wildlife and tourism management: Insights from the natural and social sciences*, 334-346.

MacDonald, D. H., Bark, R., MacRae, A., Kalivas, T., Grandgirard, A., & Strathearn, S. (2013). An interview methodology for exploring the values that community leaders assign to multiple-use landscapes. *Ecology and Society*, *18*(1), 29.

Macro Economy Meter (2012) International tourism, number of arrivals - by country. (n.d.). Retrieved January 14, 2016, from http://mecometer.com/topic/international-tourism-number-of-arrivals/

Martin, J. M., Higgins, K., Lee, K., Stearns, K., & Hunt, L. (2015). Integrating science education and marine conservation through collaborative partnerships. *Marine pollution bulletin*, *95*(1), 520-522.

Moberg, F., & Folke, C. (1999). Ecological goods and services of coral reef ecosystems. *Ecological economics*, *29*(2), 215-233.

Mozambique - The World Fact Book. (n.d.). Retrieved January 8, 2016, from https://www.cia.gov/library/publications/the-world-factbook/geos/mz.html

NVivo for PC [Computer software]. (2015). Retrieved from http://www.qsrinternational.com

Obura D, Church J, Gabrié C (2012) Assessing marine world heritage from an ecosystem perspective: The Western Indian Ocean. *World Heritage Papers* 32:1-125

O'Neill, M., MacCarthy, M., & Abdullah, P. (2002). Dive tourism: evaluating service quality. *Hospitality Review*, *20*(2), 5.

Professional Association of Dive Instructors (PADI). (2011). Statistics. (n.d.). Retrieved January 14, 2016, from https://www.padi.com/scuba/uploadedFiles/About_PADI/PADI_Statistics/padi statistics jun2010.pdf

Plummer, R., & Fennell, D. A. (2009). Managing protected areas for sustainable tourism: prospects for adaptive co-management. *Journal of Sustainable Tourism*, *17*(2), 149-168.

Prell, C., Hubacek, K., & Reed, M. (2009). Stakeholder analysis and social network analysis in natural resource management. *Society and Natural Resources*, 22(6), 501-518.

Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of the nutrition society*, 63(04), 655-660.

Reed, M. S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., ... & Stringer, L. C. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of environmental management*, 90(5), 1933-1949.

Rohner CA, Pierce SJ, Marshall AD, Weeks SJ, Bennett MB, Richardson AJ., (2013). Trends in sightings and environmental influences on a coastal aggregation of manta rays and whale sharks. *Mar Ecol Prog Ser 482:*153-168.

Serour Khaled Ramy (2004). An environmental economic assessment of the impacts of recreational scuba diving on coral reef systems in Hurghada, the Red Sea, Egypt. *Thesis submitted to the Faculty of the Graduate School of the University of Maryland, College Park in partial fulfillment of the requirements for the degree of Master of Science* 2004.

Straughan, E. R. (2012). Touched by water: the body in scuba diving. *Emotion, Space and Society*, *5*(1), 19-26.

Tapsuwan, S., & Rongrongmuang, W. (2015). Climate change perception of the dive tourism industry in Koh Tao island, Thailand. *Journal of Outdoor Recreation and Tourism*, 11, 58-63.

Tibiriçá, Y., Birtles, A., Valentine, P., & Miller, D. K. (2011). Diving Tourism in Mozambique: An Opportunity at Risk?. *Tourism in Marine Environments*, *7*(3-4), 141-151.

Travel & Tourism Economic Impact 2015 Mozambique. (n.d.). Retrieved January 8, 2016, from https://www.wttc.org/-/media/files/reports/economic impact research/countries 2015/mozambique2015.pdf

Wilkinson, C. (2008). Status of coral reefs of the world: 2008. Global Coral Reef Monitoring Network and Reef and Rainforest Research Centre, Townsville, Australia, 296 p.

Wilks, J., & Davis, R. J. (2000). Risk management for scuba diving operators on Australia's Great Barrier Reef. *Tourism Management*, 21(6), 591-599.

Wongthong, P., & Harvey, N. (2014). Integrated coastal management and sustainable tourism: A case study of the reef-based SCUBA dive industry from Thailand. *Ocean & Coastal Management*, *95*, 138-146.

Worachananant, S., Carter, R. W., Hockings, M., & Reopanichkul, P. (2008). Managing the impacts of SCUBA divers on Thailand's coral reefs. *Journal of Sustainable Tourism*, 16(6), 645-663

Zakai, D., & Chadwick-Furman, N. E. (2002). Impacts of intensive recreational diving on reef corals at Eilat, northern Red Sea. *Biological Conservation*, 105(2), 179-187.

Zeppel, H. (2008). Education and conservation benefits of marine wildlife tours: Developing free-choice learning experiences. *The Journal of Environmental Education*, 39(3), 3-18.

Appendix A: Consent for participation

Consent for Participation in Interview Research

Project Title: **Beneath the Surface: Towards improved management of the scuba diving tourism system in Tofo, Mozambique**

Researcher: Joonas Kinni

Project description: This project will use a systems approach to map out the Scuba Diving Tourism System (SDTS) in Tofo, Mozambique. It will find out the perspectives, priorities and values of the different stakeholders that make up the SDTS. The information that you provide will be used to draw a picture of the current state of knowledge within the SDTS and ultimately will assist in formulating management suggestions for improved sustainable diving practices in Tofo.

Thank you for your interest in taking part in this research. Before you agree to take part, the person organising the research must explain the project to you.

If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you to decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

I agree that:

1. My participation in this project is voluntary. I understand that I will not be paid for my participation. I may withdraw and discontinue participation at any time without penalty.

2. Participation involves being interviewed by Joonas Kinni from The University Centre of the Westfjords. The interview will last approximately 1 hour. The interview will be recorder and notes will be written during the interview.

3. I understand that the researcher will not identify me by name in any reports using information obtained from this interview, and that my confidentiality as a participant in this study will remain secure.

4. I understand that this research study has been reviewed and approved by the Masters Committee of the University of Akureyri.

5. I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.

6. I have been given a copy of this consent form for my records.

---------------------------------   --------------------------------
Signature   Date

---------------------------------   --------------------------------
Printed name   E-mail address