Changing Reef Values: An Inquiry into the Use, Management and Governances of Reef Resources in Island Communities of the Maldives

Mizna Mohamed

A thesis submitted in fulfillment
of the requirements for the degree of

Doctor of Philosophy
in
Environmental Science

University of Canterbury
Christchurch, New Zealand
October 2012

Abstract

The thesis is an exploration into the ways in which island communities living in coral reef environments value the surrounding reef resources. This research is conducted in seven communities in the Maldives. A qualitative approach is used as this inquiry involves gaining insight of human perceptions and behaviours. Discussions and interaction with participants in community activities and participant observation were the main inquiry methods used. Specifically, the research focuses on sand from the beach, coral from the house reef and fish in the island lagoon.

The exploration of reef values show that multiple reef values exist and they are constantly changing. How communities interact with the resources and how the communities itself had changed over time contribute to this change in resource value. Physical and social factors, such as resource type, availability and location, physical characteristics of islands, community size, and socio-economic conditions, contribute to the changing reef values. Based on these changing values, it is recommended to go beyond one formal governance rules that fits all. Instead local adaptations based on local ways of valuing need to be considered.

A most notable change impacting reef values is the migration of families to the capital. This reduces their interactions both with the reef environment and other community members. In addition, the current globalised education is causing the development of a predominantly globalised worldview among the present generations. In this new worldview, the sacred is separated from the secular. Thus, spiritual and moral beliefs have become isolated from resource management practices. I also find it of concern that local worldviews are being negated at the expense of concern for the global environment. I highlight the importance of schooling to instil knowledge about our local environments and local worldviews. It is also through education we can re-integrate the sacred into our practices and such changes need to be starting at an individual level.

Acknowledgements

This journey has been challenging yet memorable and surprising with many lessons learnt on the way. I am thankful to Allah for giving me patience, guidance and opportunities through the many people who have helped me in this journey. I am immensely grateful to my supervisors Dr. Nicole Gombay and Dr. John Pirker for their time, involvement and guidance throughout the supervision of this research. The current research into human perceptions is indeed a new adventure, quite different from the work I had undertaken before. I would especially like to thank Nicole for guiding me through this new area and pointing me to literature that has quite fascinated me.

This work could not have been completed without the assistance and support from many other individuals and agencies. First and foremost, I would like to mention the communities that I had visited for this research. I greatly appreciate the welcome and support given by my host families, island officials and other members of the community. As the list is many and for fear of leaving out any one person, I would not name individual community members but as per the island customs, I can say about many members that "we have now become good friends". I am indeed indebted to all the participants of this research for their invaluable contributions.

I would like to thank the support from conservation project, Atoll-Ecosystem Based Conservation of Globally Significant Biological Diversity (AEC) Project being implemented in Baa Atoll by the Ministry for Environment and the United Nations Development Programme. I would especially like to thank the staff of the AEC project for their constant support during my fieldwork. I would to make a special mention of Dr. Abdulla Naseer from the Ministry of Fisheries, Agriculture and Marine Resources for his interest in this research and continued availability to discuss ideas. I want to thank Marie Saleem, Shahaama A. Sattar, Ibrahim Naeem and Hussain Naeem for their willingness to respond to my queries on the local and scientific aspects of coral reefs and marine species. I would also like to thank Aileen Niyaz and Najfa S. Razee for taking time to read some of the chapters in this thesis. In addition, I would like to thank Drs. Sheema Saeed and Simad Saeed for their valuable advice and stimulating conversations on the environment and the Maldives in general.

The interactive, academic and social, environment at the Department of Geography meant that I did not find myself a lonely PhD student. I want to extend a warm thank you to all my colleagues at the Department and Gateway Antarctica. In particular, I want to mention Marcela Polomino, Siti Kamaruddin, Rijal Idrus, Zahid, Shuhaidha Noor, Mette Riger-Kusk, Marwan Katurji, Erin Neufeld, Joanne Stevenson, Sira Engelbertz and Gabriela Roldan. Marcela and Siti, you have been wonderful PhD companions. Our shared lunches, coffee breaks, discussions about our work and families have meant a lot to me and is greatly missed. I want to extend a special thank you to Steve George for his friendship. I have enjoyed sharing an office with you. I also want to thank Marwan for his willingness to help, especially during my last months at the department. I also want to acknowledge Daniela Liggett who is always happy to share her research experiences. I want to thank the members of the social science discussion group, that the students have organized at various times. The discussions in an informal setting have been a wonderful way to share my work and I have also enjoyed learning about work done by others.

Many others from the department have also helped, in different ways, in this journey. I want to especially thank Drs. Deirdre Hart, Garth Cant and Henry Connor. I also want to thank Marney Brosnan, Anna Petrie and Steve Sykes for always being ready to help with any queries I had. I also want to extend my appreciation to the support I had received from others on campus. Foremost, I want to thank Sarah Beaven, who had been my International Student Advisor, for her encouragement and confidence in me. Warm thanks are also offered to the staff at the previous International Student Support. The support extended by the Distance Library Service of the university library has been invaluable in the final months of my work which I completed from home in the Maldives.

The time spent away from my home country and family has been one of the biggest challenges of this experience. Within the small Maldivian community in Christchurch, I have experienced many of the gift and reciprocal exchanges that I talk about in this thesis. The gifts that our family received from each members of the community, especially during the time of my pregnancy, is warmly appreciated. Above all I value the strong friendships formed during this time. I want to especially thank Aminath Nazra, Mariyam Shihama, Badhoora Naseer and their families who had helped me during a critical time of this thesis process by looking after my baby girl, Shuaa, whenever I needed help. I add and extend a most heartfelt appreciation to Nazra for our many conversations about this work and also for taking the time to read some of my chapters. I also want to thank Abdulla Niyaz for organizing wonderful support, through his family, for my fieldwork in Baa Atoll. My friends, outside the Maldive community, had completed the base away from home for my family and me. I want to thank Anne Reid for being there for me whenever I needed motherly advice. I am also lucky to find lovely neighbours like Olive Randle and Nancy Anderson. I am very happy to have found a friend in Nancy Kim. The earthquakes in Christchurch have been a trying time for everyone and I am extremely thankful for the caring support from all my friends in Christchurch.

I am indeed blessed to have such a supportive family. It is hard to continue without fondly remembering my late grandmother, my first teacher. I am thankful for her love, patience and care in bringing me up. I also wish to thank my mother who has always encouraged me in my pursuit of knowledge. My father has been invaluable in his combination of quality grandpa time with ensuring I had time to sit and write this thesis. My little brother now that I am back home, I hope we get to spend more time together. I could not have completed this thesis without the support from many members of my extended family. I want to especially thank my cousins Naani, Marie, Hishma, Fathun and Shabana who at various times in the last year have take care of Shuaa so that I could have time to work. I want to extend my appreciation both to my family and my in-laws for our prolonged stay away is a big sacrifice for them.

My children are a joy in my life. Yoosuf and Shuaa, you both make me so happy being your mom. Yoosuf, you have grown up so much in the last four years and I know I missed many moments with you while I worked on this. Yet, you have been ever so patient and supportive, asking me when I would finish and including success for me in your prayers. Shuaa, you arrived in the midst of this journey and have been a little handful since. Just as your name means, you are a ray of sunshine in our lives. Wanting to have more time to be your mom has been a big motivation for me to continue this work. Continuing this work is also my way of teaching you both to work hard to achieve your dreams, while giving time to the special people in your life. Lastly, I thank my husband, Firag, for it is his unconditional love, support, encouragement and policing that has helped me achieve this. Firag has been with me every step of the way in this journey whether it be technical help with my computer issues, staying up with me while I wrote, listening to my many monologues about this work or stepping into the many mum duties when I was too busy.

Contents

List of Figures

List of Tables

List of Plates

Glossary of Terms

aanu	beachrock, hardpan
Addu bas	local dialect spoken in Addu
akiri	pebble or gravel
atholhu	atoll
atholhu-verin	atoll chief
bodu	big, large
Bodu Katheeb	main Island Chief
bokkuraa	a small rowing boat
dhaajehun	catching fish in the island lagoon using a large net
dhonveli	fine white sand
Eid	Muslim festive celebrations
fanditha	a type of dark magic which uses prayers and incantations
fani	larvae
faru	reef
faru-mas	reef fish
farutholhi	barracuda
filolhu	sea bream
gaa	massive live coral, dead coral rubble and boulders which are used in building houses
giri	shallow areas in the atoll waters which have massive corals that are not submerged
giulhu	streaker (fish)
gunbalha	bluestripe herring
haa	shallow areas in the atoll waters with the corals submerged
hirigaa	coral slabs cut from the live coral in the house reef
hiy-hamajehun	content or joy to the heart, satisfaction

holhuashi	a communal gathering place at the beach.
Insha Allah	God willing
Jinns	spiritual beings
kaaduge	communal food storage for staples
kashivelli	coarse, flat sand
katheeb	island chief
keyn	a meal of several courses served on a platter for festivals
Kuda Katheeb	deputy island chief
landaa	parrotfish
maahaul	one's surroundings
majaa	fun
mauloodh	festival that used to be celebrated in the Maldivian communities in remembrance of the Prophet Muhammmad (PBUH)
mushimaas	mackerel
mushimasgandu	large school of scads, usually mackerel
nakaiy	a local calendar based on the star constellations and their positioning
onu	bamboo
Ramadan	the ninth month of the Islamic lunar calendar and the month of compulsory fasting for Muslims
rihaakuru	a thick paste made from cooking the stock left after cooking tuna
rizq	sustenance or provision
rondu	triggerfish
thaavalha	silversides
thila	shallow areas in the atoll waters that can sometimes have corals
thimaa	the self
thimaa-ge	term that denotes kinship
thimaaveshi	environment
thoshi	reef surrounding an island
ufaleh	joy

vadhaa dhiyun	trolling
vaka	fibre made from tree bark
veli	sand
veligaa	beachrock
veli-hedhun	the process of sifting and collecting sand to put in the courtyard of houses
vehimas	schools of dense scads that find shelter in island lagoons
veshi	one's surroundings
veyo	a communal bath made out of coral slabs
vihaa nakaiy	a period of calm days in the Maldivian nakaiy calendar known as the time of fish spawning

List of Abbreviations

AEC	Atoll Ecosystem-Based Conservation
CPR	Common Pool Resources
FK	Folk Knowledge
GEF	Global Environment Facility
HEC	Human Ethics Committee
IDC	Island Development Committee
IK	Indigenous Knowledge
LGA	Local Government Authority
LK	Local Knowledge
MPA	Marine Protected Area
PBUH	Peace be upon him
TEK	Traditional Ecological Knowledge
TEV	Total Economic Valuation
UNDP	United Nations Development Programme
WDC	Women's Development Committee

Chapter 1

1. Introduction

The countdown for a most anticipated event is almost up. In less than a month, in June 2012, world leaders, international conservation agencies, non-government organizations, private sector and other stakeholders, amounting to thousands, will be attending the United Nations Conference on Sustainable Development (Rio+20). According to United Nations (2011), Rio+20 is a chance to "end poverty, address environmental destruction and build a bridge to the future". National, regional and international preparations in the form of preparatory meetings, informal consultations and negotiations or preparation of submission papers have been underway for the last two years. This is one of many similar conferences, international agreements and conventions that reflect the scale of today's global concern for the environment.

While national and regional representatives prepare for Rio+20, a fisherman in a coastal community may be going about his daily life, oblivious to these agreements that are to be made regarding his livelihood and surrounding environment. Many of these decisions made in international arena such as Rio+20 are implemented at the local scale. When global protocols are implemented at the local level, it not only affects people's livelihoods but the culture and traditions, social fabric and intrinsic local values attached towards the environment. Hence, I believe it is of utmost importance to understand how local communities perceive and value their surrounding environment and its resources. Perhaps such an understanding would ensure more synergistic outputs for global programmes.

As values are human constructs, I argue that values about nature can exist only in relation to human-nature interactions. We humans live in the environment, live from it and live with its unpredictabilities. "Whereas the physical [natural] world *exists* in and for itself, the environment is a world that continually *unfolds* in relation to the beings that make a living there" (Ingold 2011, p.30). This relation of the environment to those living in it is emphasized throughout this thesis.

Environmental valuation is essentially a study into these human-environment interactions. Here the term "environment" includes both the natural and social spheres of interaction. It is the interactions of humans with his surrounding natural environment and with other social actors in that environment that develop our perceptions about which aspects of nature are important, why and how. This thesis explores such human-environment interactions, of island communities living in the Maldives, in an attempt to understand how the community members value the surrounding reef resources.

In this thesis, the environmental valuation is not used in terms of monetary valuing only, but extends to include social, cultural and ecological aspects of value. The protection provided to an island by its house reef seems invaluable when faced with the furies of the seas. At the same time a day out fishing can combine multiple values in the form of social interactions, a livelihood activity, a recreational activity as well as the culture and history handed down with the traditional knowledge of fishing. A study into these values involves an understanding of many actors and interactions. Human behaviours and human-environment interactions are complex often with feedback relationships between and among multiple actors and interactions. Therefore, a qualitative approach have been identified as suitable to study these complex relationships.

1.1 Background and Motivation for the Research

As I start putting the research and its findings together for the readers, I began reflecting on how this research evolved. I am certain that this is a story long in the making; taking shape since my initial interest in understanding how the physical environment that I lived in behaved. I grew up in a small coral island, just under six square kilometres, surrounded by the ocean and plentiful reefs. The beaches, lagoons, the reefs and the marine life were a constant place for enjoyment and curiosity for me as I grew up. Having pursued my tertiary education in understanding how the surrounding physical systems work I acquired a position in the Ministry for Environment[1] in the Maldives. One of my first tasks assigned here was to develop a criteria to value coral reefs in the Maldives. Although I was not trained

---

[1] During the period covered in this research the official name for the government agency responsible for environmental policy making and monitoring has had many name changes. This has been due to the many shuffles in the government structure. To avoid confusion by using the different names, I use the term "Ministry for Environment" to represent the environmental policy-making body in the government.

in the area, I attempted this almost impossible task and it was from here onwards, that my interest in coral reef valuation began.

Coral reefs are one of the most diverse ecosystems on the earth and cover an area of about 284,300 square kilometres (Spalding, Ravilious and Green 2001). Coral reefs provide important ecosystem functions to millions of people living in coastal communities (Burke et al. 2011), The Maldives is one such community which is heavily dependent on coral reefs. The Maldives is ranked as the seventh largest country in terms of the reef area it occupies and it is estimated to contain 3.14 percent of the total coral reef area of the world (United Nations Environment Programme 2010). Islands of the Maldives are formed of carbonate sediment grown in the surrounding reef ecosystem and the reefs protect these islands from ocean waves. In addition to this, people depend on the reefs and reef resources for subsistence and income.

According to Burke et al (2011), both natural and human induced, threats to coral reefs have increased dramatically in the last decade. Storms and extreme weather events, coastal development, pollution and overexploitation of marine resources are among such threats. In addition to many of these local threats, there is widespread concern over more global threats such as coral bleaching and ocean acidification identified as impacts of climate change and global warming (Burke et al. 2011).

As the Maldives is among the most highly dependent countries on reef resources, many of these threats are of concern. According to reports, the coral bleaching event of 1998 impacted more than 90 percent of coral reefs in the Maldives (Naeem et al 1998). The First National Communication of the Maldives to the United Nations Framework Convention on Climate Change identify damage to coral reefs among the main vulnerabilities to climate change (Mohamed et al. 2001). Despite this recognition and given the fact that the continued health and use of the reefs is vital to the local communities' survival, the lack of effort by the government to move beyond "paper" policies bothered me. Subsequent research I undertook for my Master's study was motivated by the need to demonstrate to policy makers that reefs do have "real" value (Mohamed 2007). Environmental and natural resource valuation was being increasingly used to advocate for conservation of coral reefs and hence, many such research projects were being carried out in the area (Madani et al. 2012, Riopelle, 1995). Trained in the positivist, scientific inquiry paradigm, my approach at this point was looking for one true quantifiable value of the reefs. Thus, my focus was on the economic value of the reefs to determine how much visitors to a Marine Protected Area (MPA) were willing to contribute to its improved management.

As part of the inquiry into the economic value of reefs I also engaged in consultation with local communities on how to improve management of the MPA. It was during these visits that I got asked by the communities, "what is the benefit of this protection to us? This is done only for the tourists". In truth, up to that point, my engagement with local communities with regards to MPA management had been through the literature I have been reading. The literature which discusses the benefits to fishermen, the success of MPAs through local consultation and participation or sometimes even the lack of consultation and inclusion of local communities in the formulation and management of MPAs. This direct questioning by the communities was something I was not prepared for. I had gone with the aim of discussing with them the management plan I had developed and I had not even considered their willingness to participate. Were MPAs and their management a priority for the communities? I had assumed that like the local communities in the literature, the people from the islands I visited would find MPAs an important issue to discuss and be ready to contribute.

This experience was one I wondered about and I came to the understanding that the way I perceived the reefs and reef resources were very different to the way those living in the environment did. While at the policymaking level, my work focused more on global issues, such as impacts of climate change, I had assumed that the local communities would find these concerns to be important too. As a researcher it is important to see these differences, accept and try to understand these differences. Towards the culmination of my Master's research I had identified the need for the perspectives of local communities to be meaningfully included in the policy making and management of the reefs and reef resources. Hence, my interest in the current research developed. I had developed a firm belief that understanding the value of any natural environment or resource should be through the perspectives and worldviews of those living in the environment. They interact with the environment on a daily basis, depending on it, adapting to its challenges and living with its uncertainties.

1.2 Focussing The Research Question and its Implications

This research aims to explore how island communities living in the coral reef environment value their reef resources. The island communities of the Maldives are chosen as a study location for this research. The coral reefs of the Maldives are important to global research, such as understanding impacts to coral reefs and its recovery (Burke et al. 2011). While it is important to study coral reefs of the Maldives in this global context, it is a main basis of this thesis that local perceptions and views need to be better understood and included in addressing global environmental issues. The importance of scale and cross-scale dynamics is often recognized by those concerned with environmental management (Cash and Moser 2000; Rudel 2011). Scholars and environmentally concerned groups have often argued that local actions can have "scaling up" impacts on the global environment (Rudel 2011). Through much of the talk on global environmental concerns, the actions are always oriented towards the local level. I believe that for these reasons it is important to understand the local scale.

If the purpose of environmental valuation is to advocate for better management of nature and its resources, then would it not be those living in the environment most suited to ensure this? On this basis, I highlight the importance of understanding how communities living in an environment value it. For the communities living in the Maldives, coral reefs are important in the maintenance of the islands, in the provision of food, and for the main economic activities of fishing and tourism. Whether it is the protection to individual islands that is provided by house reefs, the bait fishing grounds found in the atoll waters or the contribution of tourism to the national economy, the importance of coral reefs can be felt at all spatial scales.

Looking across scales in the Maldives, both geographically and administratively, island communities are identified as the local level. People in the island communities are everyday interacting with the house reef and its resources. As such the communities develop rules and norms for these interactions. While there are rules and norms governing atoll waters and even at the national level, these rules seem more abstract to the local communities. Local communities are generally not involved in their implementation and most rules often remain only on paper (Mohamed 2007). After considering the different reef resources and how the local communities interact with them, I have chosen to focus on the island level. In this respect, the specific question guiding this research is how do the island communities in the Maldives value their house reefs and the resources within it?

This research is approached with a qualitative inquiry paradigm as research on human behaviours and perceptions involve studying complex relationships. Human values cannot be directly asked but rather need to be interpreted by going deep beneath the layers within the communities, by observing and understanding people's behaviours and ways of interaction with the resources and each other. Quantitative assessments of reef value such as the cost of building an artificial breakwater, the monthly income that a fisher earns or the cost of buying sand for decorating houses can give some indication of how the reef resources are valued. This does leave out many other human-environment interactions which create meaning and value regarding these resources. Could the price that a fisher sells his catch capture the many fish he gives away to his family or the extra fish he adds to the ones his neighbour bought? Or does the cost of the artificial breakwater capture the many social interactions and community values created through the community effort in building the breakwater. To capture these many interactions and relationships, I believe a qualitative approach would be better suited.

A pluralist approach to values is considered in this research. Multiple values exist and these different values drive different behaviours towards reefs. These multiple values can take the form of ecological, cultural, social and economic importance. In order to interpret these multiple values my inquiry focused on some specific guiding themes. These included, but were not limited to, the way community members used and accessed reef resources, the way these resources were shared, distributed or sold within and outside the community, local knowledge relating to uses of reef resources and the formal and informal management rules in place.

I had immersed myself into the research with the aim to enrich myself with knowledge that could form better reef management policies. With the recognition that existing top-down management methods are failing to conserve reef resources effectively, the Government of the Maldives had identified the need to strengthen local management institutions (United Nations Development Programme 2004). Therefore, I started this research with enthusiasm, as I was confident that understanding the views and perceptions of the local communities towards their lived environment was the most important thing in strengthening local management institutions. In addition, the management of reef resources has become an important global issue as the increased urbanisation and development of coastal societies threaten marine and reef resources (Idrus 2009). Therefore I hoped this work would add to the literature on management of reef resources. In particular, I hoped that the emphasis on understanding the views of local communities would not be ignored by those making policies regarding these resources and those managing them. Is there any better body than those living in the environment to look after its resources?

While I visited the island communities with this intention, having "lived" in the communities and listened to their stories, management of reef resources became secondary to the perceptions and values of the local communities. A better understanding of perceptions and values of local communities towards the reefs can foster partnerships between the community and policy makers or resource management agency and aid in better decision-making by policy makers. While these are some opportunities for using this research, contributing to policy making did not remain my main intention. What I viewed as most important was telling the stories of the communities, to give voice to them and share their perceptions and values towards the local reefs and reef resources. Nevertheless, I hope that resource managers and policy makers will consider the community perceptions and views presented here when developing management strategies for the reef resources.

Before going on to the detailed description of this research, I have presented some background about the Maldives in the next sections. This background is intended to give an understanding of the Maldives, its physical and social characteristics that may be relevant in providing a context for the subsequent discussions in the thesis.

1.3 Background about the Maldives

The main inquiry for this research has been undertaken in seven island communities of the Maldives. This included the islands of Dharavandhoo, Kendhoo, Thakandhoo, Maarandhoo, Makunudhoo, Hulhudhoo and Meedhoo. More detailed information of the study locations are provided in Chapter 2. This section provides some background about the Maldives and the local island communities that may be relevant in understanding the context of this thesis. In addition to using information from texts, I also use my own observations from my visits and stories narrated by participants in outlining some relevant background about the Maldives and the study communities. The descriptions of the physical aspects of the Maldives, especially the reefs and its structures, are mainly based on my discussion with local communities. Therefore, it does not contain detailed and specific descriptions or names used in the scientific study of coral reefs.

1.3.1 Physical Aspects

The Maldives is a chain of tropical coral reef islands lying approximately 480 km southwest of India (Figure 2-1). The islands span a length of 900 kilometres from north to south and is approximately 130 kilometres wide. The coral reefs of the Maldives are characterised by the numerous atoll formations. Atolls are annular or irregular oceanic reef formations which surround a lagoon. Figure 1-1 shows the structure of a typical Maldivian atoll. The diversity of reef formations in the Maldives is captured by the richness of words such as *faru, thila, giri, haa* and *gaa* used by locals to talk about reefs. Islands usually lie on the reef rim of the atoll but some islands are found in the patch reefs inside the atoll. The shallow waters near the reef islands and the reefs are known as reef lagoons while the deeper waters inside the atoll are known as atoll lagoon or atoll waters. Resources within these waters, such as diverse types of fish, sand and coral, are used by the local communities. The focus of this research is on the resources within the reefs surrounding the islands.

There are about 1190 islands dispersed over the twenty six natural atolls in the Maldives (Saeed 2005). Of these islands 196 are inhabited (Ministry of Planning and National Development 2007)[2]. The islands of the Maldives are quite small in size. According to Mohamed et al. (2001), more than 85 percent of the inhabited islands are less than one square kilometer and only three inhabited islands are larger than four square kilometers. In addition the islands are very low lying with more than 80 percent of the land being less than one metre above mean sea level (Jameel 2007). The geographic dispersion and separateness of the islands force the islands to be fairly autonomous and self-sufficient.

---

[2] The reported number of inhabited islands varies roughly around 200 in various documents. Saeed (2005) and Razee (2006) report the number to be 199 while Jameel (2007) reports a figure of 203. Populations from islands had been relocated to other islands both under the population consolidation programme and due to the tsunami of 2004.

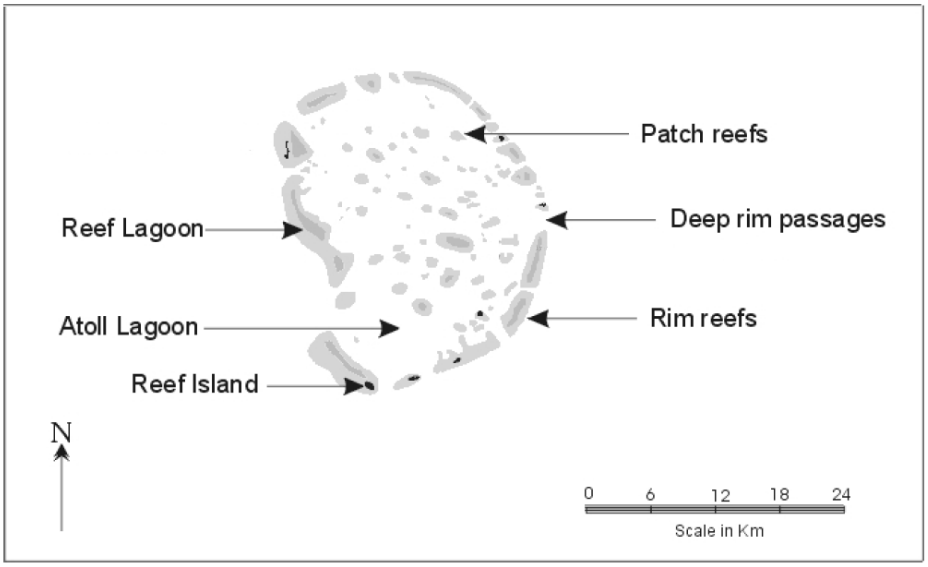


Figure 1-1. Structure of an Atoll. Source: adapted from Naseer (2003, p. 10)

Natural reefs, called "house reefs" surround most of the islands (Figure 1-2). The usage of the term originates from the tourism industry where the reef surrounding a resort island is referred to as the house reef of the resort.[3] Having a good house reef is important for a Maldivian resort as they are used by the tourists for snorkelling and diving. The use of the term house reef is now well established, mainly in the tourism industry and the government policy making bodies, in the Maldives. This usage I believe is further extended and popularly used in the diving community. This usage of the term house reef imparts a newly emerged value of the reefs for use in the tourism industry. This usage reflects and reinforces a value based on economic benefit in the form of tourist dollars. In comparison, the local name for a house reef conveys a different value of the house reef. Locally house reefs are called *thoshi*, which is a word used to denote an outer layer or shell. For example the bark of a tree, skin of fruits and vegetables or the shell of an egg are all called *thoshi* in the local language. I believe that the Maldivian value placed on what is called a "house reef" in English is primarily related to this notion of protection and shelter. The house reef provides a similar function in protecting the island from high waves.

---

[3] A tourist resort in the Maldives is a separate island and the resort operators and tourists have exclusive usage of the reef surrounding the island.

There are many variations in the structure of the house reefs. While in some islands the house reefs are close to the island in other cases the house reef may be further out. In Figure 1-2, the house reef is fairly wide and evenly distributed around the island but there are cases where the house reef is quite a narrow strip of reef and also where there are breaks or natural channels. These changes in the structure of the house reef affect the size of the lagoon of the individual islands.

Figure 1-2. A Maldivian island showing house reef surrounding it (Source: Google Earth)

Historically there is little known about environmental pressures on the house reefs. The communities described having healthy house reefs until extensive coral mining from the house reefs of islands began in the 1980s. This led to the loss of this natural protection in many islands. Artificial breakwaters had to be built to combat erosion problems posed by the loss of the natural protection barrier. In my very first discussion with a group of fishermen, I asked if the natural house reef of the island existed. I used the direct translation of the word reef (*faru*) in my query. The unanimous response was there is no *faru* around an island. For a moment all of us remained perplexed, them at my silly question and I at their response when I had clearly seen some kind of reef structure when I arrived on the island. It took a moment for them to realize my ignorance in the local terminology and corrected me saying islands have a *thoshi* around and not a *faru*. In the local context, reefs are not mere reefs but places with specific linkages and functions. In the case of the house reef, the protective function similar to that of an outer shell. This incident also demonstrates the dangers of translating knowledge I have gained in a different language and context into the local setting.

This brief introduction gives an idea of the vast number of reefs and related resources in the Maldives. The purpose of this research is to gain a deep understanding of how local communities value their surrounding reef resources. Therefore, to keep the depth of the inquiry intact I will be limiting my spatial scale to focus on the resources on and within the house reef of an island. Here I would like to state that the term "island" will be used here onwards to mean an inhabited island. If another type of island is referred to this will be specified. For example, uninhabited island or resort island. The house reefs are useful in identifying the spatial limit of my inquiry as the house reef is a natural boundary marking the islands and their local area. It is a commonly understood, unwritten local rule that all resources within the house reef of an island can be used only by the community living on the island.

The house reefs and the resources within it are used in many ways and these uses have changed over time. During my visits I had encountered people collecting shellfish and other seafood when the house reef is submerged during particular periods of the month. In some islands the house reef may be so close to the island that it is submerged at low tide. In such islands children find this a way of recreation by walking the whole length of the house reef, dipping their feet in the little rock pools created and looking at any marine creatures that may be in them. Traditionally the money cowrie was collected from these reefs. Later when more durable housing was being constructed, coral from the house reefs and sand from the beach were mainly used. Prior to this sand from the beach had mainly been used for strewing on roads and houses for special occasions. In addition to coral and sand, different types of fish in the island lagoon are used by the communities. Some of these resources will be discussed in depth in chapters 4, 5 and 6 of this thesis.

1.3.2 Socioeconomic Aspects of the Communities

The population of the Maldives, according to the latest census in 2006 is 298, 968 (Ministry of Planning and National Development 2008). This is more than four times the population recorded in the first census of 1911. According to historic accounts, it is not clear when people first settled in the Maldives. Historic references to the Maldives can be found as early as the 4th century B.C. (Maloney n.d.). The first settlers are thought to be Aryans probably from Gujarat in north-west India (Saeed 2005). Various historical accounts, both oral and written, describe settlement in various parts of the country by aborigines of India and later by the Sinhalese (Saeed, 2003).

Although the current Maldivian population represent a varied ethnic mixture of Indo Aryan, Dravidian, Sinhalese and Arabs, over time and through inter-marriages, the current social structure can be described as "an extreme case of ethnic homogeneity" (Saeed 2005, p.198). Today the people of the Maldives represent a homogeneous population which has a common language, religion and similar social and cultural structures. According to Saeed (2005), Hinduism was the religion of the earliest settlers and later Buddhism was brought by the Sinhalese. Islam is the currently practiced religion in the Maldives. Historic accounts identify the Maldives having become a Muslim state in 1153 AD.

Although formally a hundred percent Muslim country the level of religious practice is mainly liberal with an increase in the numbers of people adhering to the opposing extremes of non-belief to fundamental Islamic beliefs. Increased interactions with the outside world and most notably the increase in Maldivians living away in other cultures for both Western and religious education, may be the cause for this dynamic of people clustering at the end of two extremes. The importance of Islam in the daily lives has changed considerably compared to earlier days when religious practices were diligently observed and integrated into everyday life. This can still be seen in the way older generations talked and behaved. For example, expressions like *Insha Allah* (God Willing) are always used by elders when talking of an intention to do something in the future. As I shall discuss in this thesis, religious beliefs play an important role in shaping the worldviews of communities and hence the ways they interact with reef resources. Such beliefs are important in understanding the behaviours towards the management and use of reef resources by the communities.

Interactions with research participants were in the local language, Dhivehi. Dhivehi is the local language of the Maldives and it is spoken by all Maldivians. There are some marked differences in dialect in the four southernmost atolls. Dhivehi is an Indo-Aryan language which is related to Sinhalese and derived from Sanskrit (Razee 2006). Many other languages such as Hindi, Tamil, Malayalam, Arabic and more recently English are believed to have influenced the development of the Dhivehi language. The Dhivehi language is written in the

Thaana script which is written from right to left. The English word "atoll" comes from the Dhivehi word *atholhu* used for the ring shaped coral formations.

The island communities are usually a small, tight knit group interrelated by kin or marriage. Since traditional times these communities have found sustenance from the surrounding seas and reefs. The cultural and social homogeneity of the communities means that they are homogeneous in terms of resource use too. For example, use of sand in religious ceremonies or even the cooking of food for these ceremonies were all similar. Ceremonies such as births, marriages and deaths all were practiced in a similar manner and hence, required the same use of resources. Homogeneity in use of resources is an important factor in the use and management of natural resources (Baland and Platteau 1996). The social and kinship structure have influenced the way reef resources are used and shared by the communities.

Tuna fishing, which is based on the catching of bait from the reefs was the main local livelihood activity. A typical response to what people used to do for an income was "everyone went fishing, then". It was so much a part of their lives that tuna fishing did not need to be specified as a distinct type of fishing. Even today if someone talks of "fishing" or "fish" they are referring to tuna. This confused me a bit at first until I realized that when people used the word “fish” in general it was referring to skipjack tuna, and for other fish they use the specific term for it. For example the term "*faru-mas*" is used for reef fish. I discuss tuna fishing, the way it was conducted and the changes to tuna fishing in order to give a background into the way all community members were engaged with the reef environment. This description also tells of the changes which led to increased interaction with other forms of reef resources.

Tuna fishing, provided food as well as a means to earn an income for the communities. This was an economic activity in which men and women were equally involved. While the men caught the tuna, brought it to the island and cleaned it, the women would be making preparations for cooking. Many women recalled the times that there was so much fish to cook that they were up till the dawn of the next day. Cooking the tuna is the beginning of the women's work; they dry and process it ready for the market. The men would take it to the markets to be exchanged for other needed goods. In the south, the people traded directly with Ceylon while the northern islands brought dried tuna to the capital for selling.

The introduction of collector vessels meant that tuna caught is sold directly without it being processed in the islands. This cut women off from an important contribution to the economy of the household. In many of the islands I visited women were now involved in other activities such as production of thatch and coir rope for selling. Even today, in some islands the cottage production of dried tuna and other products takes place but the scale of such production is not as it was before. Even the scale of fishing itself has reduced. In all communities I visited people will remember the many fishing boats there used to be in the harbour. They will talk of the abundance of tuna on the shores when the fishing boats returned, the red colour of the beach and lagoon when the men gutted the hundreds of tuna and the many trips by the women to fill the large cooking pots with salt water. Now many communities have a few tuna fishing boats and some do not have any.

Many elders from local communities identify tourism as a reason for the disappearance of the traditional tuna fishing. The elders and fishermen say that the youth left fishing for the easier jobs in the resorts. The tourism sector is currently the largest contributor to the country's Gross Domestic Product, contributing over one third (Ministry of Tourism, Arts and Culture 2011). Tourism is also based on the natural beauty of the islands and especially the coral reefs. Tourists visit the country to enjoy the reefs, the beach and the waters. The introduction of tourism to the Maldives meant the development of other opportunities for locals such as reef fishing. Today locals are engaged in many reef related activities such as live grouper fishery, sea cucumber fishery and diving schools for income.

The flow of youth to tourism related jobs meant moving from their home island to be based in the resort island. In the early stages of tourism, uninhabited islands closer to the international airport and also the capital were developed as resorts. Participants from Hulhudhoo and Meedhoo in Addu Atoll related that it was people from Addu that has initiated and made tourism what it is today. According to participants, with the initiation of tourism there was a migration of families from Addu for employment in the resorts as well as the opportunity to provide the children with better education that is available in the capital. The generations that grew up in the capital mostly settled there for employment. In my visit to Hulhudhoo and Meedhoo I observed many houses which were overgrown and in ruins because the families had moved to the capital some thirty years ago.

This migration to the capital for employment and education came much later to the islands in the north (Ministry of Planning and National Development 2008). This is quite evident in the level of occupancy in the islands I visited. Comparatively more families are living in the islands of the north than in the south and the generations that permanently live on the islands are younger too. As my visits to the islands coincided with the school holidays, I found that in northern islands, a larger percent of those living in the capital return to their home islands compared to those from Addu. This may be that for the present generations, the link to their home islands has not been that distanced and they still have family to visit.

The migration to the capital by families means that many of those who live permanently on the island are elders and families of those who are employed on the island or in nearby resorts. Job opportunities on the islands now include employment in the island office, the Island Court, schools and health care facilities. Expansion of tourism to all atolls in the Maldives means that there are some opportunities for jobs closer to home too. As mentioned above, the school holidays which coincide towards the end of the year is a time when many of those who live away from the islands return home. This is a time full of activity on the islands and especially reef related activities are abundant at this time. Reef fishing, picnics to nearby islands, barbeques, collecting seafood from the house reef, swimming and snorkelling are all enjoyed by those returning home after a life in the city. This demonstrates an increase in the recreational use of the surrounding reef environment.

1.3.3 Governance in the Islands

Historic accounts show that before the first monarchy was established in the Maldives a locally determined form of governance existed in individual islands (Saeed 2003). According to historic accounts a monarchy was established in the Maldives well before the 3rd century B.C. (Saeed 2003). Following the rule by several dynasties, a constitutional monarchy was established in 1932. The monarchical rule continued until the Maldives became a constitutional republic in 1953 (Saeed 2003). However the Maldivian republic was short-lived with the country reverting back to a monarchy after less than ten months. The country became a republic for the second time on 11th November 1968 and since then have been a constitutional republic with executive, legislative and judicial branches.

For most of its history the Maldives has been an independent nation. The location of the Maldives on the maritime route from the Indo-Chinese Far East to the Arab Middle East meant that the governance and control of the Maldives was important in controlling the flow of trade on this route. As such history shows that the independence of the Maldives monarchy was under threat by foreign forces. Notable instances of foreign occupancy include the sixteen year rule of the Portuguese from 1557 and few months of rule by the Malabaars in 1752 (Saeed 2003). The Maldives entered into a treaty with the British in 1887. According to this treaty the British had the right to protect the waters of the Indian Ocean, on the understanding that they did not interfere in the internal administration or legislature of the Maldives. Formal independence of the Maldives was recognized by the British on 26 July 1965.

The timing of this research and my visits to the islands was during many changes in the governance of the country. The first multi-party election of the Maldives was held in November 2008 with the long time opponents and critics of the thirty year regime coming into power. The changes to the political dynamics of the country since the introduction of political parties is important to mention here as this change has caused much impact to the social dynamics of communities. In all communities, I noticed a big divide among families, neighbours, friends and the community at large over differing political views and party affiliations. This change was very noticeable during my visit to the communities and was often the main topic of conversation among people. For example, in the island of Kendhoo, popular for its grand island level Eid festivities, the community was preparing for the coming Eid as two separate communities, each with their own programmes. Although direct impacts on the management of reef resources from these social changes were not visible, I was afraid that some future impacts would be unavoidable.

The coming of a new government meant restructuring of the administrative structure, at the central, regional and local levels. Many of the changes at the regional and local level were aimed at establishing a decentralized government and strengthening local governance. The planned changes included the establishing of elected councils at atoll and island levels. This means that at the island level, the island office would be headed by a councillor instead of the traditional *katheeb* (island chief). At the time of my visit, in 2009, interim councillors had been appointed and the first island level elections for the council was held in 2011.

A law on local governance "*Dhivehi Rajjeyge idhaaree dhaairaathah laamarukazee usoolun hingumuge qanoon (7/2010)*" was enacted in April 2010. Under this law local governance institutions such as Island and Atoll Councils were given formal recognition. In August 2010, the government formed the Local Government Authority (LGA) to oversee the work done by the local governance institutions. Under the newly enacted law, local institutions were mandated with the power to form local rules in consultation with the LGA. At the island level this included rules governing use of resources within the island boundaries. The area under the governance of Island Councils is identified in the law as including the lagoon area and the house reef which surrounds the island.

At the time of my visit these changes were just emerging from a conceptual stage and had not been fully implemented. For example, despite the appointment of island councillors, the island chiefs still played a prominent part in the island level governance. In all islands the island chiefs were the ones who interacted with me in providing the information about the islands as they were more familiar with the island, its history and governance. At the same time, people were still more familiar and used to the older structure as the appointment of a councillor was the only tangible action at the island level in terms of restructuring. As I am reporting about my experiences during the field visit, in the discussions and descriptions of this document, I am using the previous governance structure.

The islands of the Maldives are divided into twenty administrative atolls with central control being exercised by the capital Malé. The atolls each had an Atoll Chief (*Atholhu Verin*) who saw to the administering of the government policies. At the island level island chiefs were appointed to help the atoll chiefs. While all islands had a *Bodu Katheeb* (equivalent to a head Island Chief, literally Big Island Chief) the number of *Kuda Katheebs* (deputies, literally Small Island Chiefs) varied from one to even three on an individual island. Legal matters on the island were carried out by a magistrate appointed by the president. Currently, an island councillor is added to this structure to head the island office.

The *katheebs* were advised by a committee called the *Ra'h Kuriaruvaa Committee* (Island Development Committee [IDC]). According to participants and island officials, the IDC advises the *katheebs* on all matters relating to the island development. This could be such things as the establishment of a harbour, decisions on public electricity provision and rates or fund-raising activities for island development. According to island officials from the communities, the IDC has no legal status but it has the power to make decisions on behalf of the people. The people accept the decisions made by the committee as it is appointed by public voting.

The IDCs are interesting and important to this research as all matters relating to the use of natural resources on the island and within the house reef are decided by the committee. For example, in Kendhoo and Hulhudhoo, the IDC had played an important role in discussing the issue of erosion on the islands and the IDCs advised the island officials on what measures to take regarding the use of coral and sand. In matters relating to fines for violating state or local rules, it is the IDC which pre-identifies the amount to be fined.

The IDCs had existed in various forms and under various names such as Rashu Committee (Island Committee). The members, who were mainly men, include elders, fishermen, business owners, boat owners, teachers, government employees and members from non-government organizations. In all islands there is an *Anhenun Kuriaruvaa Committee* (Women's Development Committee, WDC) where women are active in island development issues.[4] A member from the WDC is also represented in the IDC.

IDCs have been a part of the community local governance structures for many years and these were dissolved recently under the new government. Having been in the communities as this happened, I was able to experience the range of emotions that they felt. Hurt, loss, dismissal and displeasure were the main emotions coming through the community discussions of this news. Despite the differing political views of community members, for a brief moment everyone seemed to be united at this loss they felt in common. From these reactions by the community members, I came to conclude that the IDC's were a deeply rooted concept in the island governance structure. Perhaps it was the historical roots of it as well as the acceptance by the community on how the IDCs functioned. At a time when families, communities and the nation is divided by political differences, I find this reaction to the abolishing of IDCs surprising and am hopeful that communities can find a commonality in terms of the linkages to their environment; the island, the lagoons, its resources and the governance of these resources.

---

[4] The WDC is mainly involved in community work to raise funds for development in the community. In addition to conducting skills development workshops for women in the community the WDC also contributes to the building of public infrastructure such as women's mosques, schools and community centers.

Now two years after the field visits, Island Councils, having a similar function to the IDCs are in place in the islands. These councils are promising in strengthening local governance in the communities, especially in the reviving of local management institutions in place for the use of reef resources. These local management institutions are examined within this thesis in relation to reef resources and how they are valued by communities. Therefore, a brief background to these institutions are also included in this section.

1.3.3.1 Local Management Institutions

The physical separateness of the islands and being away from the central government has meant that day to day operations run quite independently with the islands managing most island level problems on their own. The local level issues which are of relevance to this thesis are how reef resources within the house reef are managed locally. Value theorists identify that values lead to action or particular behaviours. In this sense, an inquiry into how people value reefs needs to examine closely particular behaviours surrounding reefs and reef resources. Therefore, it is important to examine the management institutions governing resource use.

From observations, I find that there are both a "formal" and an "informal" management system in place. The formal are those that are formalised by legal standing and this includes mainly the laws and regulations coming from the central government. This will be discussed under the term "state rules" within this thesis. A list of state rules relevant to this research is provided in Appendix 1. The communities again distinguish two types of informal management systems. The first are the social norms and behaviours that are commonly understood and accepted by all. These are unwritten rules which are handed down through tradition and practice. I will be referring to these as "norms". The second are the local rules that are made by the communities themselves. These will be referred to as "local rules" within this thesis. The communities identify the local rules as separate from norms. According to participants local rules are things made by the community through discussions among the community and people accept this as a rule. This means the community accepts that people who violate these local rules can be punished. Here I would like to give a background on how local rules are formed in the communities.

Traditionally, local rules have played an important part in the island level governance. As reported by many participants, local rules are made when there is an issue and it needs to be addressed. For example, the fishing of scads at low tide results in the fish fleeing with an injury and fishermen have observed that such behaviour leads to the scads permanently leaving the island. Once such an issue is identified the concerned parties, which often happen to be fishermen and elders, would bring the issue to the attention of the island office. This starts off the process of local rule formation in the community.

Such initial talks are never done formally as meetings in the island office but done informally sometimes when they meet at the mosque or even at the *holhuashi,* a communal gathering place at the beachside where men socialise. The more formal discussions occur at the next stage when the issue is discussed at an IDC meeting. In all islands, both officials and community members reinforced the idea that the island chiefs cannot take any decisions without discussing with the IDC. Discussing matters with representatives from the community had been a long standing tradition. Further informal discussion takes place with IDC members and the other community members. This maybe during fishing trips, socialising in the *holhuashi* or even going to the shops. In this way the general view of the people gets included through the IDC members.

After discussions the IDC will decide on any action or a rule such as allowing certain times and equipment to catch fish in the lagoon. On getting the decision from the IDC, the island officials will inform the residents of the island about the new rule. These used to be done as announcements in a public gathering and later notices put on public places and even over public announcement systems.

A self-policing mechanism exists in the communities where each and every member would remind people of the rules if there are any rule breakers. Both island officials and community members agree that people almost always comply with these local rules. Sometimes it is young children who might break rules but always anyone from the community who sees this would advise them about the rules. These management rules and how they are enforced with regards to the use of sand, coral and fish in the lagoon are discussed in Chapters 4 and 5.

While communities identified good compliance with local rules in the past, island officials and elders also showed concern for changes occurring in the community with regards to how local rules are perceived by younger generations. Younger generations do not see the local rules as "real"; that is having formal legal status. Island officials find it much easier to implement state rules. Local rules are now losing their place with the need for everything to be formalised. From discussions with community members and observations I note this change to be one of the effects of the political changes in the country. The establishment of political parties had led to the opposition using legal laws and the constitution as ammunition against actions of the existing government and this continued once the government changed. These discussions, debates and talks are highly publicised on news media and had led to a sudden "awareness" by the public of what can be lawfully done and what cannot. I do not believe this "awareness" is purposefully created to trample the informal local institutions that have existed and succeeded in managing their local resources. This is perhaps one among other possible impacts, that I had pointed to earlier, arising from the social changes in the communities.

These changing perceptions in management also reflect changes to how values regarding reef resources are evolving with the generations. Both changes in the natural and social environments impact how resources are used and in turn valued by the communities. I hope the brief background presented here on the Maldivian communities and the surrounding reef environment is helpful in the reading of this thesis, outlined in Section 1.4.

1.4 Outline of the Thesis

This thesis is organized into six chapters. Gaining knowledge is a process and from the point of deciding a particular research area, a researcher has already engaged in the study. Identifying relevant literature or choosing a particular research approach are all part of the research process. Hence, I have chosen to follow this introduction chapter with a discussion of literature on methodologies and the research methods employed. Chapter two gives an extensive discussion of my approach to the research explaining why the research is approached in the particular way. This is followed by a detailed description of the study locations, the methods engaged and problems encountered in the field, the analysis and presentation of the findings.

Chapter three provides a discussion of the relevant literature. The bodies of literature relevant to exploring human-environment interaction, in particular the role of value in these interactions are reviewed and discussed in the chapter. This includes theories on value and natural resource valuation and traditional ecological knowledge. As reef resources in the Maldives are identified as a common pool resource, the theories on common pool resources and their management are also discussed. The literature review is followed by the main findings in which these theories are further discussed.

The main findings of the research are presented in Chapters four and five. Each chapter discusses a particular type of resource and its importance in the communities. I have chosen these particular resources as they are the main reef resources used by the communities. While Chapter four focuses on the stationary resources, sand and coral, Chapter five explores the mobile fish in the lagoons.

There are three main types of fish in the lagoon discussed in Chapter five. By the local identification of all fish except tuna as reef fish, the fish in the lagoon are also considered reef fish. These reef fish are further named according to behaviours, sizes of fish and schools and the duration of stay in the lagoon. The first type of fish discussed in Chapter five are large schools of scads in the lagoon. These are groups of small fish such as anchovies and mackerel that stay in the shelter of the island lagoon continuously for a long period of time. The second type are smaller schools of reef fish that exist in the island lagoon and I have used the term "lagoon fish" for this. Finally, large school of mature reef fish that sometimes enter the island lagoon are discussed. This is opportunistically caught by the community and shared by the members. I have used the term "community fish" for the discussion of this type of fish.

For each resource, how it is used in the communities and the local management institutions in place are discussed. The chapters conclude with an interpretation of how the communities value the resources, based on their perceptions and behaviours towards the resource. These value implications are also discussed in light of relevant theories.

Chapter six concludes the thesis and provides a reflection on the research process as well as the main findings. Human values are complex and dynamic in nature. As such values regarding reef resources are changing across generations, time and across communities. This chapter provides a reflection on these changes in reef value. The thesis is concluded with a discussion of the wider implications of the findings. As such the chapter explores what the changing reef values mean both to the communities and the management of reef resource in general. The importance of valuing the environment in relation to those living in the particular environment is reiterated. An emphasis is also placed on the importance of local worldviews for understanding the way humans interact with their natural and social environments.

2. The Research Process

2.1 Introduction

My research interest in finding how communities in the Maldives value their reef resources grew out of work I had conducted on obtaining an economic value of reefs (Mohamed 2007). It was during this work I came consciously to recognize that often the voices of the local communities, though important, are not really heard. Thus, I set out to inquire on what aspects of the reefs are important to the communities, how do the surrounding reefs shape their everyday lives and how do the communities in turn impact their surroundings.

When I first set out to find the value of reefs in the Maldives for my Master's research, my approach was quantitative. I explored various methods of putting a dollar value to the reefs and their functions. The research process brought to my attention the complexities involved in the work and the impossibility to identify one "true" value. For example, how would it be possible to put a dollar value to how future generations would value the reefs? Or what estimations could be made to value possible future benefits from the reefs? In the wake of the previous work I could see that my approach had been based on my view of the environment as an isolated realm independent of human interactions. Hence, my attempts at valuing had been of an imagined reef environment that I did not reside in. These attempts have led to a firm belief, also identified in the review of the value literature in Chapter 3 of this thesis, that value cannot exist outside human perception. It is through the various interactions with their environment and with each other, that people develop a belief of what is important. Hence, I learnt the need for, and importance of, exploring how people who lived in the reef environment valued the reefs.

In this sense, my approach for the current research was pluralist, with the belief that there cannot be one true value. Rather, multiple competing values can exist depending on who is doing the valuing. The fishermen catch bait from the reefs in order to obtain tuna.

Tuna is both used for food and exchanged in the market to earn a living. The sandy beaches are the everyday playground for the young children as they come to play in the late afternoons accompanied by their mothers or grandparents. Families and friends enjoy the beach and lagoon by going to picnics. Each individual interaction imparts a different meaning and value to reefs and their resources.

The more I interacted with local communities, listened to them and took part in the everyday island life the more I became aware of how differently the people viewed the surrounding reefs and reef resources to what I had assumed. The reefs were not external agents outside the communities' realms of existence, but very much an integrated part of everyday life. Having grown up in the city, away from the everyday interactions with reefs, my ideas about the reefs had been more in lines of preserving nature; protecting them from humans. Hence, I found the different ways of looking at reefs by community members who are continuously living in the environment both intriguing and important. Such worldviews where humans are an integrated part of nature is common in many non-globalised societies (Moran 2006). It is important that an inquiry into values held by communities should be made through the particular worldviews of the local people. The cultural worldviews of the communities guide their everyday lives and interactions with the reefs and reef resources.

As I have pointed out in the Chapter 3, humans and their relationships with others and their surroundings are complex. These relationships and values are human constructs and are changing with every passing moment, experience, and interaction (O'Brien 2003). Therefore, such a complicated feat should be studied, by living in the moments and experiencing the lived environments. With the awareness that valuing nature is deeper than just its economic value I started this research with a mindset that a qualitative approach would be more suited for this inquiry than the quantitative approaches I had used for my Master's research. Within this chapter I explore and discuss this research process, including the shaping of this research, the various methodological considerations and the way I set about conducting the research and presenting the findings.

2.2 Methodological Considerations

Methodology guides the way we approach and conduct research and make sense of the findings. I have found that one's approach to research is not static but is evolving with the research process. Once I was able to identify my research focus, I explored the literature to identify how the research could be approached to discern what methodologies could guide my research. Initially trained in the physical sciences, research into human nature and perceptions is a new area for me. Hence, I found how to go about this research a learning process. Though the relevant literature was important in finding my way into the research, what I have realized is that a firm understanding of methodologies comes from experiencing the research process. The thoughts that get into the formulation of the research, the exploration of various methods of inquiry, the interaction and exposure with the research environment and subjects and the organization of information all contributed to the grounding of the research methodology. Therefore, reflecting on the research process, I find that I have been learning and developing my methodology in an ongoing manner.

My paradigmatic positions have been shifting and evolving as I proceeded with the research and increased my knowledge of the different ways to approach it. My earlier research into finding an economic value of reefs had been approached with a positivist, scientific paradigm administering a set survey questionnaire to elicit people's willingness to protect reefs. As is with the scientific inquiry, my questionnaires ensured easy administration with minimal influence by the researcher. Yet the carefully chosen research questions geared to test certain hypothesis meant it limited the responses by participants to generate a numeric value of reefs. This reduction to a number, thus, leaves many gaps, missing pieces and untold stories about the communities and their relations with reefs. Can the price of a bag of sand tell the story of how people make use of the sand to build their houses, or explain when sand became important as a building material, or reveal what alternative materials were important for this purpose and what other historic and cultural significance sand had? How can simple acts of giving and sharing fish and the social ties created by this process be captured in the economic value of fish? Many elderly fishermen fondly recall their childhood and youth as they tell fishing stories. Can these memories be captured in a structured questionnaire aimed at finding a pre-identified value?

As can be seen my research methodology was guiding me away from the positivist approach. The abandonment of this inquiry paradigm for the current research was not a conscious act but one that evolved as my grounding in the ways to research human behaviours and perceptions developed. My changing disposition demonstrates the shifting nature of the human mind. Our thoughts and perceptions are changing with each interaction and experience and as the researcher I am not immune to being human. McGrath and Johnson (2003, p. 34) critique the positivist approach as giving the researcher this privileged status of "being exempt from influence by the very "laws of human behavior" that they are studying."

Qualitative methodologies have guided me in the rest of the research process as I find such approaches seek to understand beyond what is seen on the surface. A qualitative approach is well suited to understand such an ever-changing research subject as human behaviour and perceptions. Qualitative methodologies have been favoured as a way to inquire about human nature and behaviours (McGrath and Johnson 2003; Denzin 2009). According to Denzin and Lincoln (2005), qualitative approaches help capture a more accurate idea of what is important in the minds of the participants.

Qualitative paradigms are based on interpretivism and constructivism (Sale, Lohfeld et al. 2002; Denzin 2009). In contrast to a positivist paradigm, qualitative approaches do not seek one "truth"; but acknowledges multiple realities based on one's construction of reality Social constructivism assumes that "our perceptions of reality are viewed through a lens focused by societal norms and values" (McGrath and Johnson 2003, p.34). The perception and understanding of the order of reality are different for different individuals and groups (Robinson 1998). Hence, these realities are not fixed but changing with individual lived experiences and interactions. The perceptions of locals regarding reef resources are similarly, constructed beliefs that individuals develop through their interactions with their environment; both the natural and the social. These processes are so much a part of everyday life that it would not be possible for an individual simply to pick and point out what aspects of the physical and social environment has contributed to their perceptions about reefs. I, myself, even with careful reflecting, would not be able to express simply how I value the reefs. Perhaps others would be better able to interpret my perceptions about reefs by interacting with me, listening to my views and observing my actions and behaviours.

The inquiry into people's perceptions and behaviours needs to be understood through their perspectives and experiences. Therefore, it is important that such an inquiry also be ethnographic research. Ethnography sets out to describe and interpret the behaviours, customs and ways of life of a particular culture or social group (Creswell 1998). Ethnography also emphasises giving voice to people in their own local context. In order to do this the researcher engages with participants in the research environment, listens to their narratives, observes and participates in their lives, thus "living" the experience. This experience of living and participating in the daily life of the communities is why I situate this current research as having ethnographic roots despite the length of time spent in the field being less than traditional ethnographic work. Then again, my objective is not to study an entire culture and social life as traditional anthropologists. Modern ethnographic work therefore, may not require such an extended timeframe as traditional anthropological fieldwork (Freidberg 2001).

This discussion of research methodologies shows that this research is not guided by one single inquiry paradigm but engages in a variety of qualitative paradigms. I have found that one mode of inquiry cannot fully guide the understanding of complex issues such as human nature which often crosses many disciplinary boundaries. This current inquiry into how people value reefs and reef resources cross-cuts disciplines such as ecology, human psychology, anthropology, sociology, economics, natural resource management and human geography to name a few. Zahra and Ryan's (2005) methodological reflections bring to light similar issues of the complex nature of tourism research and thus, the need to adopt multiple inquiry paradigms that complement one another. The authors suggest that such difficulties and deliberations of choosing an inquiry paradigm are faced by many researches, yet there is a "silence" regarding this issue.

As can be seen in the above discussions, understanding of social life through qualitative inquiry paradigms are based on interaction and interpretations (Phillimore and Goodson 2004). Interaction and interpretation means the role of the researcher is very important in such inquiry. The researcher is not seen as independent of the research but one among many social agents that influence the research process (Phillimore and Goodson 2004). In the quantitative-qualitative debate qualitative approaches are often criticised as being influenced by the researcher. However, it would not be possible to conduct any research without some degree of influence as human interactions impact the formation of our perceptions whether in everyday life or in a research setting. Therefore, it is imperative that the background, knowledge, personal experiences and views of the researcher are conveyed to the readers. This interaction between the researcher and the readers aids in the interpretations of the research made by the latter. For this purpose such aspects about me, as may be relevant to this research are described in Section 2.3.3.3.

Keeping an open-mind about which inquiry paradigms to use permits the researcher to pick and choose paradigms based on the usefulness in a particular situation (Zahra and Ryan 2005). This allowed more flexibility in my research process and easy adaptation to unanticipated situations. Thus, I have allowed the situation and intuition to guide the methodological approach taken.

2.3 The Research Method

This work is based on qualitative research conducted in island communities in the Maldives. From a reflection and discussion of why the research was approached in a particular way, I now come to discuss the research method. In this section I will describe and discuss how the research was formulated, the different encounters of conducting the research and interpretation and presentation of the findings.

2.3.1 Designing the Research

Once the main questions of inquiry were identified, I set about to design the research process. Initially work was carried out to gain an understanding of the theoretical and methodological aspects related to the research. The result of this work has been presented in Chapter 3 and in Section 2.2. Literature on the theory and practice of qualitative research methods, ethnographic studies and resource valuation were consulted to identify suitable research methods. As stated earlier, a qualitative approach was considered for this research as I believed values regarding reefs and their resources cannot be asked directly of community members. Therefore, in order to interpret such values I found interviewing and participant observation as the most suited methods for this inquiry. Through discussions with community members, I could gain an understanding of how they regarded the reefs and what aspects of the reefs were important to them. Participant observation further gave me an opportunity to verify information I got from discussions. Participant observation allows a researcher to observe the participants in their everyday lives and which may lead to information that did not come up in interviews. For these reasons I decided to use these methods as my main mode of data collection. Further details of the use of these methods will be discussed later within this section.

In addition to reviewing literature on relevant theories and research methods I made a preliminary visit, from December 2008 to February 2009, to the Maldives to gain background information on the research environment. During this time, I discussed my research with government and local experts to increase my knowledge on the local situation and needs for reef resource management. Through these discussions I was able to identify potential information sources, field locations and local contacts for conducting the research. The Atoll-Ecosystem Based Conservation of Globally Significant Biological Diversity (AEC) project of the Ministry for Environment was identified as a main focal point in the Maldives to assist in the logistics of my fieldwork. I have collaborated in a similar manner with the AEC project for my Masters research. Appendix 2 gives a description of the AEC project and its aims.

I also spent time in island communities to improve my understanding of the research topic from the perspectives of the communities. I was engaged in everyday community life and took the opportunity to talk with people as well as observe the community, their use and management of reef resources. Upon invitation I also participated in reef related and community activities, such as celebrations, picnics and barbeques. This time provided valuable experience to develop my research and helped me to shift from a conceptual understanding of my topic to one that reflected tangible reality. The experiences from this initial visit and the information obtained were extremely useful in identifying potential study locations and participants for the research. The criteria used to choose communities for the research are given in Table 2-1.

Table 2-1. Criteria Used for Selection of Study Locations

Criteria	**Notes**
1. Population	Low population were considered as the study aims to look at small communities.
2. Geographic location	This was aimed at including different regions from the Maldives.
3. Resource Use	The uses of reef resources such as varieties of fishery or the absence or presence of tourism were considered.
4. Accessibility to islands	This included the ease of finding transport to the location as well as the ease of being introduced to the communities.
5. Background information and literature	The availability of these information as well as ongoing environmental research and conservation projects in the area was also considered.

The size of the island communities (criteria 1) and the interactions they had with the reef resources (criteria 3) were the main criteria I used to identify study locations. Following these criteria I identified Baa Atoll as a possible study location. As can be seen from Table 2-2, there are atolls with a lower population but Baa Atoll was considered due to the variety of reef interactions available in the atoll. Compared to the other atolls with a lower population, the presence of an established tourism industry in Baa Atoll offered more opportunities for using reef resources in the atoll. In addition, the existence of the AEC project in Baa Atoll was another reason for choosing the atoll. The AEC project also had similar considerations; the smaller size of the atoll, abundance of reefs, existence of a variety of reef related activities in the communities and the amount of related research already conducted in the atoll; in choosing the site (United Nations Development Programme 2004). The existing research relations established by the AEC project in Baa Atoll also meant easy access to study locations (criteria 4). This is an important criterion as the ease of introduction to communities was critical for successfully conducting the research. While the presence of the AEC project meant easy coordination with the research communities, I also hoped my research could be useful for the project.

I also aimed to include islands from different geographic regions of the country. Baa Atoll provides a study location in the mid-regions of the country. In addition, I included island communities from the north and south. This offers an opportunity to look at how communities interact with the reef resources in different locations. The islands in the northern and southern parts of the Maldives have notable differences in terms of their physical characteristics. For example, the islands in the south are larger compared to the northern islands. There might also be differences in the reef resources available and hence how the communities use them. It would be interesting to see whether there are any differences in how resources are valued in the different communities.

I continued to use population and resource use as the main criteria in choosing islands from the northern and southern atolls. Taking into consideration the interaction with the reefs, the islands with the lowest population were chosen from each atoll[1]. As the study of

---

[1] The islands of the Maldives generally being small they are lowly populated and hence, for the purpose of the study any island would suffice as a small island community.

human-nature interactions involve research into two extremely complex subjects, the choosing of small populations would help reduce the complexities that may be found in larger communities. Small size of communities has been identified as leading to efficient self-governance of resources (Baland and Platteau 1996; Ostrom 1999; Aswani and Hamilton 2004).

Table 2-2. Population distribution across the atolls

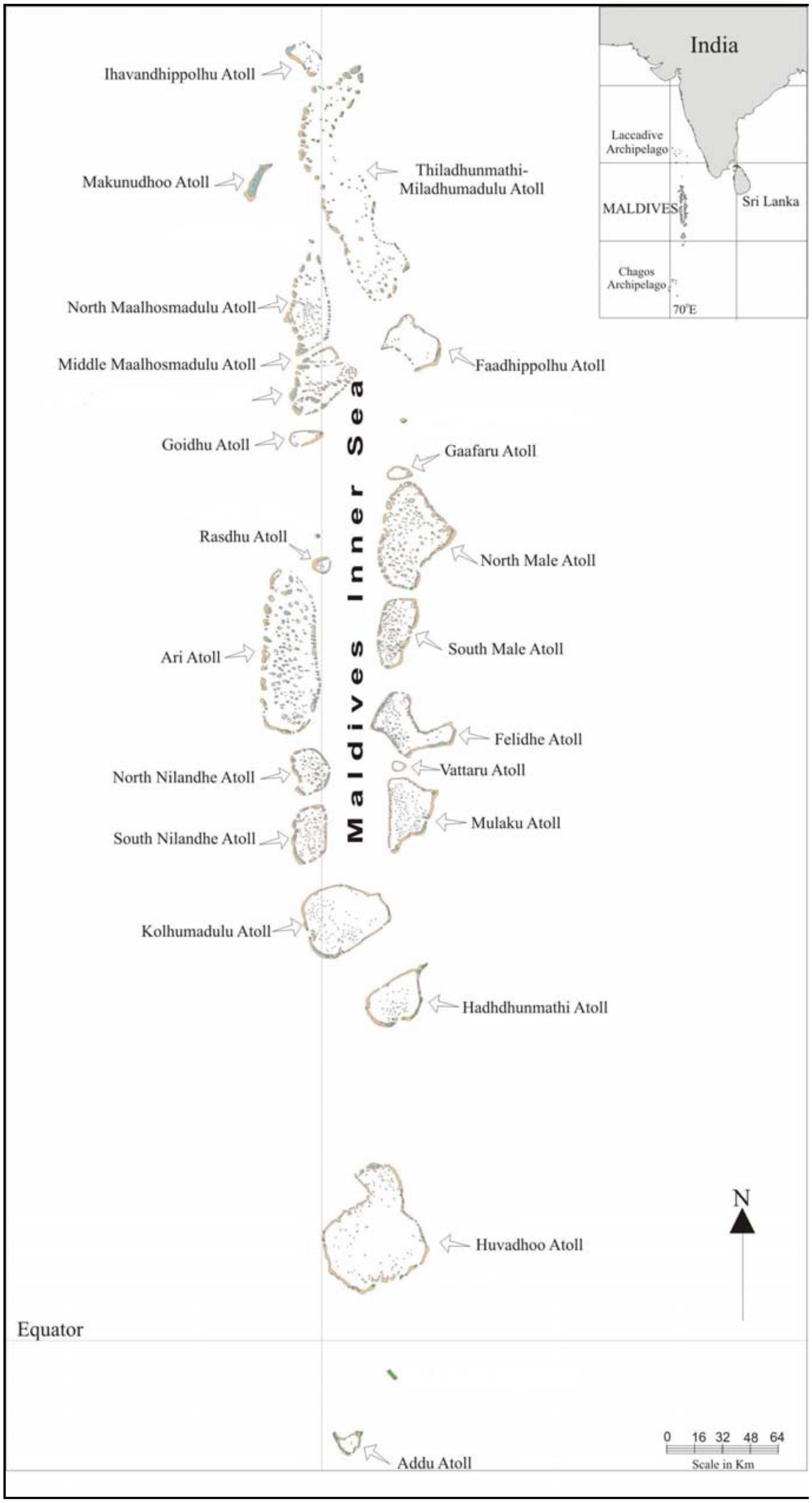
Atoll	**Population from Census 2006**
North Thiladhunmathi (Haa Alif)*	13,314
South Thiladhunmathi (Haa Dhaalu)*	16,214
North Miladhunmadulu (Shaviyani)	11,830
South Miladhunmadulu (Noonu)	10,015
North Maalhosmadulu (Raa)	14,643
South Maalhosmadulu (Baa)*	8,893
Faadhippolhu (Lhaviyani)	8,346
Malé Atoll (Kaafu)	10,149
North Ari (Alif Alif)	4,855
South Ari (Alif Dhaalu)	6,921
Felidhe (Vaavu)	1,502
Mulaku (Meemu)	4,654
North Nilandhe (Fafu)	3,662
South Nilandhe (Dhaalu)	4,720
Kolhumadulu (Thaa)	8,451
Hadhunmathi (Laamu)	11,743
North Huvadhu (Gaaf Alif)	8,007
South Huvadhu (Gaaf Dhaalu)	10,991
Fuah Mulaku (Gnaviyani)	7,636
Addu (Seenu)*	17,862

Notes: * denotes the atolls where this research was conducted.

Conducting fieldwork is very dynamic and difficult to conduct as planned. This is especially true with qualitative research where you get the opportunity impulsively to follow leads that arise while following the main trail. These surprising turns, I found, were the most rewarding. As such despite the criteria reviewed in Table 2-1, some of the locations where the research was conducted were slightly different from those initially planned. Seven islands; two from Baa Atoll, two from Addu Atoll and three from the northern part of the country were visited for conducting the research. More details of these islands are provided in the next section. A map of the Maldives showing the planned and actual research locations are given in Figure 2-1.

Interviews are the main inquiry method used in qualitative work. As I was not heading into the field with the aim of finding certain information I decided to have open informal discussions with individuals and small groups. Discussion in groups are especially useful as they engage the participants in a range of communication processes which are closer to everyday conversation (Wilkinson 2004). Robinson (1998) recommends the use of more informal methods as this would reduce the extent of influence by the researcher and at the same time allow the ideas of the participants to emerge. Such lessened control over the direction of interactions can enable participants to develop themes most important to them and also help draw attention to themes previously unanticipated by the researcher (Berg 2007). In the planning stage of this research I had identified some themes to guide the discussion. These included (i) access and use of reefs and reef resources, (ii) consumption and distribution of resources in the community, (iii) local knowledge on resource use, (iv) changes to resource availability and (v) property rights and management rules of reefs and reef resources. See Appendix 3 for further details of guiding questions for the research.

Participants of the research would include, but were not limited to, fishermen, elders, community leaders and women. I anticipated that the discussion themes would vary slightly depending on the participant. For example, with fishermen the focus might be more on the direct interaction with the reef resources whereas, with community elders the discussion may lead to finding about the community and resource management in earlier times. I would not be deliberately focusing on certain themes but let the direction of the conversation guide me.


India
Laccadive Archipelago
MALDIVES
Sri Lanka
Chagos Archipelago
70°E
Ihavandhippolhu Atoll
Makunudhoo Atoll
Thiladhunmathi-Miladhumadulu Atoll
North Maalhosmadulu Atoll
Middle Maalhosmadulu Atoll
Faadhippolhu Atoll
Goidhu Atoll
Gaafaru Atoll
Maldives Inner Sea
Rasdhu Atoll
North Male Atoll
Ari Atoll
South Male Atoll
Felidhe Atoll
Vattaru Atoll
North Nilandhe Atoll
Mulaku Atoll
South Nilandhe Atoll
Kolhumadulu Atoll
Hadhdhunmathi Atoll
Huvadhoo Atoll
N
Equator
Addu Atoll
0 16 32 48 64
Scale in Km

This research involves interviewing individuals and discussing issues of resource management, especially the use of reef resources. This topic maybe a potential source of conflict among various local users and communities. Thus, the discussions may involve obtaining information which may be of a sensitive nature among the participants. Prior to implementing the research, approval from the Human Ethics Committee (HEC) of the University of Canterbury was obtained. The university's ethical guidelines were followed as closely as possible without affecting the aims of the research. The other formal research authorisation required from the Department of National Planning in the Maldives has also been approved. This is an over-arching approval for conducting research in the Maldives. Ethical considerations of this research are further discussed in Section 2.3.3.

2.3.2 The Study Locations

From the initial design stage I was clear about choosing multiple locations for the research. In the Maldives, the sea and its resources are considered a common pool resource. This understanding allows people from many islands or even other atolls to use the resources within any atoll water. Therefore, I find that using a multi-site approach would increase the understanding from the different groups involved. For example, Freidberg (2001, p.364), in her inquiry of fresh food commodity chains between Africa and Europe, found that participants were "more ready to discuss the weaknesses and wrongdoings of another group than their own". Therefore, considering interaction of different communities I believe visiting various communities would give me more insight to their everyday situations. In addition, this would give me an insight into the perspectives of people from different parts of the country. This would help me understand how the different physical and social characteristics of communities impact the way the people interact with reef resources.

There is increasing literature on multi-site ethnographic approaches which according to Marcus (1995, p.96), "examine the circulation of cultural meanings, objects, and identities in diffuse time-space". Marcus (1995) attributes this emergence of multi-site ethnography to the increase in anthropological study that crosses many disciplinary areas. This is the case even for the current research. Within the literature I found that multi-site work usually considered different sites having different backgrounds, organizations or geographical settings (Freidberg 2001; Hannerz 2003; Harper 2006). Hannerz (2003) uses the term "multilocal" in describing studies conducted in various sites with a similar cultural and social background, similar to that in the Maldives. As an example, the author regards the work done by Malinowski (1960[1922]) in the Trobriand Islands as multilocal in his following along the journey of the Kula ring. Following this definition by Hannerz (2003), I find the term multilocal more suited to this research.

Multi-site or multilocal approaches are criticized in that they may not reveal information in depth about the culture studied (Hannerz 2003). Given this, it is important to understand that I am not intending to study the entire culture and social life of one particular community. Rather, my purpose is to understand how the communities value and perceive reefs and reef resources. A clear idea of the research objectives would help ward off such doubts about the lack of depth in understanding that can be gained from the research (Freidberg 2001). Another concern I had about this method was the length of time in the study locations. Again, the aim of a particular research topic rather than the study of the entire culture meant that the time allotted for the fieldwork should be sufficient. More time may not necessarily mean new information will be generated. I planned not to fix a length of stay, but rather to let the flow of information determine how long I stayed. The point I reached data saturation would be when I departed from a particular island. Data saturation is used here in line with Bowen's (2008, p.140) definition that "saturation is reached when the researcher gathers data to the point of diminishing returns, when nothing new is being added". This was the main indicator used to assess when I reached data saturation.

The main fieldwork was conducted from October 2009 to January 2010. During this time I visited seven island communities in the Maldives. **Error! Reference source not found.**3 gives the communities visited along with some demographic information about the islands. Locally in identifying an island, the atoll name is usually used as a prefix. This reduces confusion over islands with the same names. For example, there are two islands, in Addu and Laamu Atolls, with the name Hithadhoo. As there are no islands with the same name in this study the atoll name will not be prefixed in the discussions.

The figures from island offices are based on those registered on the island whereas the census figures give those on the island at the time. The population figures from the Maldives Census in 2006 and that given by the island offices in 2009 shows a significant difference. This difference, though to some extent captures population growth, largely shows the migration of the population to the capital, Malé and to resorts for employment and education. Although the census figure for Meedhoo is higher than for Hulhudhoo, the figures provided by the island offices reflect an opposite trend. On communicating with the island offices, I was informed that the number of people migrating to the capital is higher in Hulhudhoo than in Meedhoo.

Table 2-3. Islands visited for fieldwork

Atoll Name	Island Name	Population	Main Reef Interactions
Thiladhumathi Uthuruburi (Haa Alif)	Maarandhoo	882 (530)	- tuna fishing - reef fishing - lagoon conflicts - community fishing
	Thakandhoo	901 (340)	- reef fishing - lagoon conflicts - community fishing - recreational
Thiladhumathi Dhekunuruburi (Haa Dhaalu)	Makunudhoo	1476 (1045)	- tuna fishing - reef fishing - grouper fishery - community fishing - recreational
South Maalhosmadulu (Baa)	Dharavandhoo	977 (740)	- tuna fishing - reef fishing - community fishing - lagoon conflicts - recreational - tourism
	Kendhoo	1117 (858)	- tuna fishing - reef fishing - community fishing - tourism
Addu (Seenu)	Hulhudhoo	3506 (1147)	- tuna fishing - tourism
	Meedhoo	2638 (1458)	- tuna fishing - tourism

Notes: The main population figure is that obtained from island offices during the visits. This is the population at the end of September 2009. The figure in brackets is from the Maldives Census of 2006. The reef interactions are based on my observations in the communities.

Of the seven communities visited, in-depth research was done in five of them. These are the islands Kendhoo, Dharavandhoo, Thakandhoo, Makunudhoo and Hulhudhoo. Maarandhoo and Meedhoo were visited to verify information arising during research in Thakandhoo and Hulhudhoo, respectively. The location of the island, Makunudhoo, is unique in that it is an isolated natural atoll and is the only inhabited island in that atoll[2]. These were quite interesting factors as this island would provide a contrast to the other communities I have chosen where the atoll waters are shared with other communities.

The scheduling and other logistical arrangements for the visits were coordinated by the AEC Project. The project also provided some financial support for the travel in the Maldives. Despite the dynamic change in events and sometimes directions of travel, the staff of the project were very accommodating and efficient in making the arrangements.

2.3.3 Engaging in Fieldwork

Qualitative research is often unpredictable as such work is done in the "real world" where there are many uncontrollable factors. Often what is planned may be different from what actually is. Therefore, a reflection of how the work unfolded is an important part of presenting the research. In this section, I describe how I engaged in the research process and particular issues of importance that I encountered during the fieldwork.

The main method to gather information was to have semi-structured discussions with individuals and small groups depending on the preference of participants. In addition, participant observation, and participation in community activities was also done upon invitation.

2.3.3.1 Getting Introduced and Ethical Considerations

According to local practices formal approvals to conduct research are not asked from individual communities. Such a request would have raised more confusion as this was not the way things were done. Instead the island offices are informed, by the related government agency or educational institution, of the researcher's visit and a request is sent to provide required assistance. As per the culture of the islands this is an assumed understanding, an unspoken request and approval, between the agency and the community. Such an introductory letter was sent by the AEC project informing island offices about my intent to conduct research in the communities.

---

[2] Makunudhoo Atoll is actually an atoll on its own, but for ease of governance the atoll is considered to be part of Haa Dhaalu Atoll.

I did not want to be seen as a person working for the government, but this procedure of entry is required for formal support from the island offices. The introductory letters explicitly identified me as a student and in my later discussions with the community members I made clear that the research was not carried out on behalf of a government agency and this was solely for the purposes of fulfilling requirements of my education. This was an attempt on my part to make clear my position as a student researcher. So while formal introductions were made to the island officials, I also obtained help from friends and family members to get more personal introductions to the community.

Initially upon arrival I was met with my host families and made welcome in their homes. The more formal introductions to the community was in the form of visits to the island offices to talk with the island chiefs. This was the formal welcome to the community and during this visit I further explained about my research. All the island offices were very receptive of the research and assured full support for any assistance I may need.

The chiefs are usually elders who hold a vast amount of information about the island, the region and its history. Therefore, during the initial visit, I consulted with them to identify participants for my research. Participants were identified based on their level of knowledge, roles and involvement in relevant topics. In addition to the island chiefs I also inquired from other community members about possible participants. Snowball sampling was used to identify future participants.

The island office offered to provide a field assistant to get me introduced to the various participants. In order to reduce formalities and perception of linkages to a government research, I declined and chose to get introduced to the participants and other community members through my host families and friends I had made. I am very indebted to the time these people spent to assist me. Many a times, I also approached people and asked if they would like to participate in my research. Apart from these discussions with a set time, I made use of any opportunity that arose for discussing my work with community members. I have provided a list of participants in Appendix 4. Actual names of participants are not included, instead pseudonyms are used to maintain anonymity and confidentiality.

As per HEC guidelines participants were informed about the research project and all participation was voluntary. Approval was obtained from HEC to present this information orally. The information prepared for oral presentation is included in Appendix 5a. Appendix

5b provides a checklist to ensure all participants are informed prior to participation. The main reason for oral presentation was to reduce the formalities and increase the level of trust between the researcher and the participants. Maldivian communities are generally suspicious of official documents and associate them with being government related and hence, develop distrust. This may cause the participants to be more guarded when giving responses or in some cases might cause bias as participants may try to use the opportunity to let their views regarding the government be heard.

From my experience doing similar work for my Masters research I am aware that use of consent forms give a formal feel to the participants and hence, inhibit their participation. This has been a subject discussed by other researchers doing work in the Maldives (Saeed 2003; Razee 2006). Razee (2006) explains that the use of consent forms would be perceived by Maldivian communities more as coercion than informed consent. Taking these into consideration, approval was again obtained from HEC to gain informed consent orally with voluntary participation as an indication of their consent. The only piece of information participants were interested in was what the research was about and where I was studying . It was sufficient that I was student researcher for them to participate happily.

Irvine and Gaffikin (2006) describe qualitative fieldwork as "messy" and researchers as they encounter the political and ethical "perils and pitfalls" of the field realize that things never go as planned. As much as I tried to follow what was stated in my HEC submission, this was not always possible in the field. Even the oral presentation of information about the project was taken by many participants as too much formality. Thus, I was not able to present completely the detailed information given in Appendix 5a. Almost all participants did not want to hear these details while some may politely endure the details for some time. With a wave of their hands they would dismiss this as unimportant. It was the nature of Maldivian people. These formal things are not so important and usually the moment you are introduced to someone a connection and trust is built between the two. It is not a formal one of researcher and researched but a personal one where you become their friend. Razee (2006) had similar experiences where participants would sign consent forms even without reading them. Upon suggesting they read the content the response had been that they trust her and there was no need to read it. Perhaps this ease of building trust comes from the fact that the researcher is a Maldivian. Sultana (2007) had a similar experience while conducting fieldwork in rural Bangladesh. Participants told her that it was not seen as a problem to talk to her as she was from Bangladesh, a *deshi* girl.

From here I would like to digress a bit about a Maldivian way of introduction and the concept of becoming a friend. This is something I have known and experienced outside the current research, but became more aware of through my reflections of these visits. People in the islands are very open and friendly to visitors. The locals would be the first ones to talk to you and quiz you to learn who you are. A typical introduction would start with asking if you are from another island, where you are from and who your parent and family members are. This will be followed by trying to find a common connection, people that you may know in common or places you have visited. Surprisingly, I have found that there is always a connection. It might be as close as being related, having common friends or just having once met someone from my island. In this introduction and finding a commonality you are now connected to them as their friend. "Now we are friends" would often be the concluding statement. It is this relationship which deems unnecessary the formal things and make the conversations very open. As suggested by Irvine and Gaffikin (2006) these interpersonal relations established during the field visits would deeply affect both parties and their perceptions about the research topic. I find that this newly formed connections are more binding than the formal ethical approvals.

This making of affective connections based on shared friendships represent wider social norms and relationships in the community. The close kinship ties, shared norms and behaviours of consideration that results from these relationships implies a *Gemeinschaft* (community) as described by the sociologist Ferdinand Tönnies in his work *Gemeinschaft und Gesellschaft* (Nilsson and Hendrikse 2011). These community relationships are important in the way reef resources are managed and used in the communities. The ways in which these community values are related to the use and management of reef resources are discussed in Chapters 4, 5 and 6.

2.3.3.2 Conducting the Interviews

My interaction with most participants occurred as single encounters. Participants chose the location, time and duration of the discussions. I was a keen listener eager to accept any amount of time the participants could spare. Most participants were eager to talk for lengthy periods of time. This ranged from half an hour to two and a half hours. I always made sure I had enough time in between discussions so I did not have to rush any participant. I spoke to most people at their homes but sometimes I spoke to them at their work or places where they frequently visited during their free time. For example, at shops with shop owners or the *holhuashi*, a social gathering place near the beach. I had occasion to talk with some participants on several occasions. This may have been due to time restrictions in the initial meeting, the need for further clarifications or them being key informants with in-depth knowledge.

Although the guiding questions, given in Appendix 3, were in English all conversations were held in the local language, Dhivehi. I deliberately did not have this translated to Dhivehi as the written form is formal and less colloquial. Reading from a written script would lose the informal nature of the conversations. As I was fluent in both languages I directly translated to spoken Dhivehi while talking with the participants.

These pre-identified topics were only meant as a guideline and many times the conversations diverged from these. These diversions only added to the richness of the information I collected. It was very rarely that participants hindered from giving responses other than questions I asked. I soon recognized that although participants agreed to having the talks recorded, they were still hesitant to speak. At such times I would stop the recording and continue the conversation. Most were happy to talk, narrate stories about and beyond my topics and even ask me about my views and opinions. I was being quizzed and asked for information as much as I was asking them. I acknowledge these interactions may affect the participant's responses, but this is an inevitable part of being in a community. It is not possible to live in isolation of the community and expect to learn about them.

Discussions with each participant did not follow the same pre-determined dialogue of a written script. Instead as we interacted, our conversations took different turns and corners. With each new interaction, the views and thoughts of the researcher changes slightly and such in a series of interactions the knowledge that is being constructed gets added. Each interaction matters in this construction of knowledge. It is a very fluid process that cannot be determined before nor can the dialogues of this process be written before hand.

At the beginning of interviews community members were hesitant to talk openly about issues relating to reef management. This hesitation came from them positioning me in the role of a Ministry for Environment official visiting their island to research about the environment. A more detailed discussion of positionality in the field is given later in this chapter. “Ministry” and "environment” these I learnt were specific words which had their own meanings in the local context. Locally these were linked with the government and formality. Increased interactions with participants helped make clear my position as a student researcher. In addition, the local "word of mouth", especially in the smaller islands, is very effective in spreading information in the community. The way communities talked became more open as the community got to know me better and understood that this work was not for the government. I am confident that what they were sharing with me were their honest thoughts and views.

Sometimes participants would use these opportunities to make their own views be heard or make their dissatisfaction with the government be known. As described in Chapter 1, this was a politically sensitive time in the Maldives and individual communities were dramatically polarised between the ruling and opposition parties. Often participants wanted to discuss the political situation with me as I was a person outside the community. These discussions helped in my later analysis of the interviews and to separate out information that may be politically biased. Discussion on how resources are managed is often an area in which such biases occur. For example, in one interview a group of fishermen were repeatedly adding comments about how the previous government provided many benefits such as fuel subsidies for fishermen and the present government was posing difficulties. I was able to compare the information I got from this interview with discussions I had with other fishermen to get an idea of the wider picture.

As I had indicated in my HEC submission I planned to transcribe the interviews at the site and give the transcriptions to the participants to check them. This was not possible due to a fault with my laptop and I did not have easy access to a computer. Therefore, I offered participants the opportunity to listen to the recordings to check for any information that they did not want me to include in the research outputs. Not a single participant wanted to do this. One person, during the interview, expressed his wish not to include certain parts of the talk in my outputs. I have acted according to this wish, and I cannot include his reasons for this as in such small communities this information might allow people to identify him. This information was not vital to the research findings. Often the response would be, what is said has been said and there is nothing that needs to be hidden. Another common response was that if there were things that need to be hidden then it would not be said. Such responses were almost always accompanied by hand gestures waving off my suggestions as unnecessary.

In addition to interviews, I also observed the community and participated in activities upon invitation by members of the community. My observation from talking with people outside the formal discussions, or just being in a place are noted as field notes and these were later used in my analysis. I got the opportunity to take part in many community activities. Some of these activities are described in **Error! Reference source not found.**4. All of the activities may not be directly related to the use of reef resources, but these encounters gave me opportunities to socialise with community members and hence, talk less formally. These encounters also gave the opportunity to observe and verify things discussed in interviews.

Table 2-4. Observation and Activities Participated in during Island Visits

Island	**Activity**
Dharavandhoo	Trolling (*vadhaa dhiyun*) near the island: This is with a group of young women in a small boat. This was something they do often in the weekends for recreation
	Night time reef fishing: Reef fishing in small boats is done by many for recreation
	Family night fishing: This was a large family outing organised as a treat for the children on getting back their school report cards
	Observed return of boats with reef fish and how it was shared
Kendhoo	Making food for Eid festivities: This is done in each house by family and neighbours reciprocating help
Thakandhoo	Observed the return of small trolling boats from daily fishing. An ad hoc fish market is created upon their return
	Making coir rope: Groups of women usually go to the beach in the late afternoon to make rope
Makunudhoo	Full day picnic to a nearby uninhabited island.
	Catching fish in the island lagoon using a large net (*dhaajehun)*.
	Community cooking for Eid celebrations
	Collecting seafood from the house reefs at low tide.
	Night time reef fishing from the shore
Hulhudhoo	"Making sand": A process by which gravel or pebble size coral is hand sifted and taken for decorating courtyards of houses

The activities I participated in provided useful opportunities to understand about the resources and its uses by the community. In addition to the above activities, the everyday living in the community, with host families, provided me with opportunities to understand the links between resources and social interactions. This was a more in-depth understanding than I would have got from interviewing alone.

2.3.3.3 Positionality, Insider or Outsider

The researcher is a key component of qualitative inquiry as it is through the eyes and ears of the researcher that the stories of the participants are told. Researchers are "indeed fully 'attached' to the research context, whether they wish to be or not" (McGrath and Johnson 2003, p.35). Therefore, it is inevitable that this reporting process is influenced by the experiences, positioning and worldviews of the researcher. As McLafferty (1995, p.437) points out "[e]xcept in rare cases, the researcher holds a "privileged" position - by deciding what questions to ask, directing the flow of discourse, interpreting interview and observational material, and deciding where and in what form it should be presented." This privileged position assumes a power holding in the production of knowledge.

In order to situate the knowledge produced it is important to be reflexive about the researcher's positionality in the field (Sultana 2007). Who we are and who we are perceived to be both influence the research process (Madge 1993). While the participants may see me in more than one role, this is not far from the truth. The researcher brings to the field many facets of the self. Madge (1993) refers to this as the multiple "self". Each self brings a different aspect to the research. I have provided an examination of aspects of myself, personal and professional, that may have relevance to the research in Appendix 6. For me, this helps to be alert to the ways in which my views may impact the research process. In addition, I hope this background on the researcher benefits the readers too in their interpretations of this work.

Often the concern raised about researcher positionality is how it may cause bias in the interactions with the research environment and in interpreting the information from the field. Although, I have worked in the government, this research is not undertaken in any capacity as a government official of the Maldives. While I gratefully acknowledge the financial and logistical support for the fieldwork from the AEC project, I would like to state that the research process, its findings and conclusions are independent from any influences from the Project. All work presented in the thesis and any shortcomings are that of my own.

I would also like to highlight that it is my positionality and what I bring to the research that provides my own unique way of interacting with the research process. As suggested by McGrath and Johnson (2003, p.35), "understanding human behaviour in circumstances that are outside the realm of experience of the [researcher]" may well be a "handicap".

Having acknowledged that as the researcher I am fully immersed in the research process, I embarked on the fieldwork confident that my identity as a Maldivian would instantly allow me to be part of the community. I could communicate with the community members in our own language, except for *Addu bas*[3], and had a better understanding of the local environment, especially the social and cultural aspects than a non-Maldivian researcher would have. My confidence also came from having visited similar communities to discuss environmental issues in my role as an employee of the Ministry for Environment. In addition, I had work acquaintances, friends or family members in the communities I was visiting. This made me confident of being regarded as an insider.

Although generally seen as a privileged position, being an insider is considered to have complications too. Some of these drawbacks identified by Chavez (2008) includes social role(s) in the community affecting the researcher role, requests to take sides in political and moral issues, difficulty with recognizing patterns due to familiarity with community and bias in selecting participants. The levels or types of complications experienced would vary according to researcher and the research project. Many of these complications, I believe, arise from the researcher being an insider in the sense that he or she socializes within the community and is part of the everyday life of that group. In this aspect I was an outsider to the community and hence unfamiliar to social and political dynamics of the community. As suggested by Chavez (2008, p.477), I was perhaps at a position to take most advantage of the interactions with the community; the "positionality at the intersection of insider and outsider".

After spending time in the community and reflecting back on these times and listening to the audio tapes I realize I was never completely an insider. At times I was an insider but most often an outsider who was accepted more as a guest by the community. Reflecting on

---

[3] People from Hulhudhoo and Meedhoo speak in a different dialect called *Addu bas*. While I cannot speak it I can understand most of the spoken word. Most Addu people are fluent in my dialect.

my time in the islands I can see that it was not my position as a researcher alone that places me as an outsider. The first identification is I am not from the island. When I first arrive in an island people would stare at me. It is almost like you can see their quizzical thoughts asking "who is this?". Many people would approach and inquire who I was and the first statement would be "You're not from this island, right?". This I did not necessarily see as openly categorising me as an outsider but rather as a way of identifying and placing me in their link of relations as discussed earlier in this section. Foremost, this position places me as a guest in the community and according to Maldivian culture and customs guests are highly regarded. Therefore, I could never completely become an insider and be treated like everyone else.

This position of not being from the community but a Maldivian places me in an advantageous position in regards to my research. Many participants "see me" as a neutral person who might "objectively" listen to their individual views about an issue. For example, many elders shared their view that the reason large schools of scads do not come to the islands is because the younger generation do not have regard for the fish and use ways that harm the fish when catching. Those that belong to this younger generation would share their side of the story, often denying they harm the fish. Mothers would add that they were just children and having a bit of fun. My position as a Maldivian outside of the community is useful in listening to these stories without taking sides. I am not claiming to know the whole picture but acknowledge these are just fragments each narrated in the view of the person telling the story. To these fragments I add my own views and interpretation.

Upon my first arrival and in initial meetings participants assumed I am working on behalf of the government. The role of government official, especially one from the Ministry for Environment, put me in a position where the community was judging my intent. Throughout my stay in the communities I emphasised my role as an independent student researcher. The communities were more receptive of this position and willing to truly participate. I say truly as after spending time I could tell, from the way they talked to me and the terminology used when they were genuinely giving their thoughts. I was able to observe these differences in tones and language during the transcribing of the discussions. Having been to the communities earlier as a government official I could readily pick up the two tones they had, one for my government official self and another for my student self. The participants too were presenting different selves depending on how they perceived me. "I knew that I would get (on the verbal level) only what I was supposed to hear" (Hall 2001, p.9). Hall (2001) describes this expected behaviour by participants in terms of the Japanese concepts of *honne* and *tatamae*. While *honne* represents what people really think in a given situation, *tatamae* is the self that is represented to the public (Kondo et al. 2010).

Here it is important to narrate further on my "government official" self to give an understanding of the change in tone I am relating. My first role in the Ministry for Environment was implementing an internationally funded climate change project. Under the activities of the project there were components to educate and create environmental awareness in the island communities. We would conduct "environmental awareness workshops", usually lasting for a day or two. We would present information on issues such as climate change, beach erosion, waste management and protected species and tell the communities how best to manage these issues. Now in hindsight I can see we always assumed we knew how things should be managed in the islands. The sources for the information we provided were through the globalised education we had received and reading about how things were done in other places.

It is the words and terminology that we used in these workshops that the participants used when they first talked with me in this current research. They would talk about how they "protect the turtles", "manage the waste" or "protect the beach and house reef". I could instantly pick up these words we had been teaching at the awareness workshops. Perhaps participants felt that these were words that the "government officials" wanted to hear and thus were using *tatamae*. The words sound like it has been practiced over and over. With repeated interactions and my clarification as a student these tones changed and these practiced words got replaced by their own views.

I can tell there is a difference in how people respond when you have spent time in the community and know them on a personal level. In a small island community in the Maldives, you do not have to meet every person individually for them to know you. Once you have been there for a while almost everyone knows who you are, where you are from, everything about you including your personality. Moser (2008) argues that personality is an emerging form of positionality in the field and that this has been completely overlooked in the positionality literature. According to Moser's (2008) experience, the way foreign researchers get treated by local villagers were based on their "personalities" rather than "positionalities". I hope that through interactions the communities have acquired a sense of the importance I place on honesty and keeping trust. I also hope that the closeness that community members have kept with me is a reflection of how they see my personality.

Looking back to my role as government official I can now see that people from the communities have had good practice using these terminology. We also held local consultations in communities as part of projects to discuss policies or environmental activities to be implemented. I now realize that during these consultations the participants are speaking in the same manner using words that we would like to hear. I remember feeling how successful these consultations were. After this current fieldwork I can see the act they put on. Many of their views are quite different from what we assumed. For example, many of the participants find the idea of climate change to be farfetched. Another example is the view on beach erosion. There were many participants who disagree with our teaching that taking sand from the beach contributes to island erosion. Shareef who is in his sixties said there is an uninhabited island he used to visit as a boy and people have been taking boats full of sand from there for years but the island is unchanged to this day and remains the same as he can remember from his childhood. Such observations and reasoning determine their view. One fishermen questioned how the officials come to the island, show some slides on the screen and then teach the fishermen to take care of their boats and catch. The fishermen reasoned that these officials would not have set foot on a fishing boat and so would not understand the difficulties in actually implementing the ideas presented.

Through this experience in the communities and the conversations with the locals I could see reflections of myself and others who visit these communities on the pretext of knowing their views and hearing their voices when the actual purpose was to see how we can make them understand or teach them the "right" way to manage "their" surrounding environment. Knowing and being with the communities truly has shown me that it is we who gain from taking the time to listen and learn from them.

Being a student helps in the people talking to me without the expectation of getting something back. I could not help but wonder what would the participants expect of me. They have been used to researchers who come to the communities and do interviews with them.[4] After the tsunami of 2004, many island communities were inundated with streams of

---

[4] This is especially true for Baa Atoll where the AEC Project implements many such activities.

researchers; especially foreigners from various international agencies. This was a time when the people hoped for some material benefit from these visits. The most that materialised were infrastructure for storing and sorting waste. I found during my visits that these infrastructures had become dumps without proper maintenance. These experiences perhaps have lowered expectations of communities and so they do not expect much in return from the researcher. At most their hopes were to be heard and for someone to give them a voice. According to participants, most of the time they are not aware of how the information is used by the researchers and how their voices are portrayed.[5]

How could I convince them that I would be any different? I could not use any words to convince them. I did not make false claims that I would be taking their say to the government and make the policy makers listen. I was upfront in saying that I was there to listen to their voices, learn from the knowledge they had and portray it as accurately as possible. I hoped that I could capture what really mattered to them in terms of reef resources, and I hoped the policy makers would find some use of my work. I expressed my hope to visit the islands again to present the findings of my research. The families I stayed with as well as friends I have made had invited me to visit them again with my family, not as a researcher but as a friend. My hope was that even if a visit cannot happen in the near future, I would translate a summary of my research findings and present it along with a copy of the thesis to the communities. I hope that in the time I had spent with them they have got to know my personality and find me trustworthy.

Entering the communities as an outsider I felt more an insider and part of the community when I left. For the first time I was really understanding that the study of ecosystems, resources and their management is truly a study of the individuals, communities, societies and cultures. I could tell the exact moment of this realization. After returning from the field I was in an AEC Project meeting, as an observer while they discussed with consultants about implementing activities of the project. I had been in a similar meeting at the same place with the same people just before going to the field. The latter meeting was a different experience for me. I could hear my inner voice telling the participants in the meeting

---

[5] While at home in the Maldives, I was invited to participate in a door-to-door household survey by a government agency. After completing the survey I inquired in what form the results would be presented and where I would be able to read it. The interviewers were not prepared for this question and the response was they just do the interviews.

"That's not what the people think, that's not what they want". I felt like an insider representing the communities.

2.3.4 Making Sense of the Data

The visit to the islands had been physically challenging with vast amounts of travel on the sea. Physically worn out, I was sure that bigger challenges lay ahead out of the field. My first task once out of the field was to start transcribing the audio recordings from the discussions. This was an immense task as I had had recorded discussions with 85 participants from the seven communities. As mentioned earlier, I was not able to transcribe in the field as I had originally planned. To ensure the protection of the information and maintaining confidentiality of participants I personally transcribed the recordings. This also kept me familiar with the data and helped to locate information easily for the analysis.

All transcripts were in Thaana script which is the written form of the Dhivehi language. This was to maintain as closely as possible the original form of the discussions without meanings being lost in translation. Maintaining the original would be impossible as in the first instance the spoken word once transferred to the written loses many features which may help in the analysis. For example, conversations are not smooth flowing like the written word. They often have incomplete sentences, pauses while thoughts are being processed and facial expressions and tone that add to the interpretation. A conversation is marked by the contribution of two or more people and this multiplies the uncertain nature of a conversation. Therefore, they are never linear and often digress from one topic to another before returning to where it trailed off.

The Thaana scripts were used in the identification of emerging themes. After themes had been identified, the categorizing of the information into these themes were done in English by paraphrasing the Thaana text. As the reporting of this research is in English this is an inevitable step. This shift from one language to another brings changes to the context of the original language. There is no single correct way to translate a text (Temple and Young 2004). According to Hennink (2008, p. 30), the translation process involves "constructing a particular social reality of the study participants that may not have the same conceptual equivalence in the language into which it is being translated". Therefore, the importance in translation is not in knowing the technicalities of the language but to have an understanding of the language in the cultural and social context of the participants. Having grown up using both Dhivehi and English, I have a good understanding of both languages and thus, this puts me in a good position to do the translations. As the researcher I also have a direct experience of the research process and the discussion, thus reducing biases if a translator was used. Nevertheless, I acknowledge the translations will be influenced by my views and positionality. In the presenting of this research, direct quotes by participants are given with the original Thaana text alongside it. I provide this for the benefit of the Maldivian readers.

As discussed in Section 2.1, this research does not aim to test a particular hypothesis or theory. Therefore, my analysis of the transcripts was inductive, allowing the data to guide me in the themes that were produced. I read and coded the information into elements and linked these to identify themes in the data. These coarse themes were iteratively refined to form the main findings of this research. I linked the themes from the analysis of the transcripts to my observations in the field. For example, I used notes I had taken during the interviews and my observations of the community to screen out possible biases in the information I received from participants. My observations and notes also helped verify certain aspects of a theme or add more detailed knowledge which participants may have not thought to include. The final themes and findings were examined in light of documented literature and theories.

2.3.4.1 Representing Community Voices

I have encountered and experienced much during the visits to the communities. There are many different stories to tell and much to make sense of. Bruner (1991) argues that the human experiences and memory of happenings are organized in the form of narratives. Narratives are how we interpret and make sense of what is learnt in the field (Denzin 2009). As the researcher it is I who am obliged to give voice to the participants. From the many stories from the field, I have to find which narratives are relevant to the story I am telling. Ultimately what is presented to the readers are my own interpretations of the reality constructed in the field. A complete picture can never be given nor verified. According to Bruner (1991, p.13) "[n]arrative "truth" is judged by its verisimilitude rather than its verifiability".

I have attempted to include many voices in this narration; that of the fishermen, the island leaders, the elders, the women and the youth. Each have their story of their interactions with the reefs. The many types of narratives I present in this document help tell the main story of this thesis. Some are stories told by participants which are either fiction or comes from their real life experiences. Sometimes one may tell the story of another which is again narrated. I have also presented stories that are based on my observations and experiences. I have also made use of photographs from the field and illustrations to add a level of visual narrative.

I hope that these different forms of telling the story does justice to the real life experiences of the communities I visited. I hope that this text will bring to the readers an understanding of the ways communities in the Maldives interact with the surrounding reefs and how they perceive them. While my views are entwined with those of the initial story-tellers, the readers, based on their individual experiences, will make their own interpretations of this text.

2.4 Chapter Conclusion

In this research I have embarked on understanding how island communities in the Maldives perceive and value the surrounding reefs and reef resources. As an inquiry into human behaviours and actions I found that a qualitative approach would be most suited for this research. Through the methodological learning process I found that a single inquiry paradigm would not be sufficient for this research which crosses many disciplinary areas. Basing the research in a constructivist view, the inquiry is guided by the belief that human perceptions and behaviour are socially constructed and thus need to be understood though the lived experiences of the communities. Thus, an ethnographic inquiry paradigms also guide this research process. A over-arching approach to this is that human perceptions cannot be asked directly but rather needs to be interpreted by interaction and observation.

The research was conducted in seven island communities in the Maldives. These were the islands of Dharavandhoo, Kendhoo, Thakandhoo, Maarandhoo, Hulhudhoo, Makunudhoo and Meedhoo. Informal conversations using guiding topics were the main method of inquiry. I also partook in community activities and observed the communities to help increase my understanding. The information I collected in the field were analysed to identify a main story for this text. Keeping to the traditions of most qualitative research, narratives are used in telling the story. These stories, experiences, memories, myths and pictures, presented in the coming chapters, represent more than voices of the participants. They are the lived experiences of the communities as interpreted by the researcher. Many bodies of literature help in making sense of the experiences and information from the field. Chapter 3 provides a discussions of the bodies of literature that this thesis engages in.

3. Literature Review

3.1 Introduction

This thesis engages in exploring human-environment interaction, in particular the role of value in these interactions. The research focus of this thesis is to explore how the island communities in the Maldives value their house reefs and reef resources? The theme of human-environment interactions crosses many research disciplines including natural resources science, economic anthropology, geography, sociology and environmental psychology. The literature regarding this theme is as immense and varied as the different disciplines that the area cuts through. The review of these literatures has helped initially shape up the research and also strengthened my understanding of theories and concepts that this thesis engages in. In this chapter I will discuss the literature that I found to be most relevant and central to this research.

As the thesis explores the values that communities place on reef resources, theories on value and natural resource valuation are central to this research. In particular literature on the formation of human values towards natural resources, the translation of values to behaviours and how these values influence the management of the resources are explored. Theorists from diverse fields, such as psychology, anthropology and sociology have emphasized the importance of value priorities in understanding and predicting people's attitudes and behaviours (Schwartz 1992; Rohan 2000). I believe the value people assign to reef resources can be inferred through their attitudes and behaviours.

The understanding of people's values towards the reefs also requires an understanding of the social interactions within a community. The use, exchange and sharing of reef resources by community members help create social bonds and community values. It is therefore, important to engage in literatures surrounding values and these social processes. How are values formed through the extraction, consumption, exchange and distribution of goods and services in communities? How does value change or evolve through these processes?

In addition to these theories of value, I have found the literature on common pool resources is important in understanding this research. This is in view of the fact that the local communities consider the reefs and reef resources to be a common pool resource. Theories of common pool resources are thus relevant in understanding the local systems in place for management of these reef resources.

The management of the reefs by the local communities comes from a long history of living in the reef system, interacting with the reefs and hence, gaining an immense wealth of knowledge through these interactions. Such knowledge that communities hold, often referred to as traditional ecological knowledge (TEK) needs to be understood as it is this knowledge that also influences people's perceptions, behaviours and particular worldviews. I believe a research into how communities value their reefs should be done with an understanding of their particular worldviews.

The above mentioned bodies of literature is discussed in the reminder of this chapter. In addition to these main areas of literature, I will be delving into other bodies of literature while developing the thesis' arguments and throughout the discussion of my findings.

3.2 Value and Natural Resource Valuation

"There are no such *things* as values" (O'Neill, Holland and Light 2008, p.1). One can only imagine the joy I felt in reading this statement echoing my thoughts as I struggled with the literature to find a clear definition of what a "value" is. Many authors agree that there is no consensus on the use of the term value and its concepts across the varying disciplinary areas (Bentrupperbäumer, Day and Reser 2006; Seymour et al. 2010). Bentrupperbäumer et al. (2006, p.726) identify value as a term "that is genuinely struggling at this crossroads of cultures, disciplines, concerned communities, management challenges, and statutory requirements." Although O'Neill et al. (2008, p.1) shun the thought of values as a "thing" they identify values as a concept which reflect "the various ways in which individuals, processes and places matter, our various modes of relating to them, and the various considerations that enter into our deliberations about action." This again points to the basis of this work; namely, that values are human constructs. As such, different disciplines have different meanings and ways of constructing values.

The theories of value and its concepts have been discussed in a variety of disciplines, such as philosophy, human psychology, sociology, ecology, economics, anthropology, geography, natural resource management, environmental psychology, ethics and cultural studies among others. The initial focus on values had been from a socio-psychology perspective but this varied among different disciplines. In the field of natural resource management, human values have been looked at from ecological, economic and also social science perspectives (Gamborg and Fleming 2004; O'Brien 2006; Seymour et al. 2010). Marketing and consumer behaviour research explores values through attitudes and preferences of consumers to goods and services (Allen, Ng and Wilson 2002; Watkins 2010). The different disciplines also have their own methodological ways of approaching questions of value. Some of these include ethnographic, qualitative and quantitative approaches. A discussion of these different methodological approaches is included in Chapter 2.

It is neither the focus nor the intent of this research to deliberate over all these different notions of value. This research specifically focuses on human values regarding natural resources. Therefore, my focus will be on the different theories of value and value-attitude relationships that have influenced the formation of value towards natural resources. I therefore initiate the values discussion with an overview of how valuation of the environment and nature is approached in natural resource management.

3.2.1 Valuation of Environment and Natural Resources

Traditionally, valuation of natural resources have focused on the economic components of value (Riopelle 1995; Houghton and Mendelsohn 1996; Gamborg and Fleming 2004; O'Brien 2006). These valuation methods have been criticized for taking a utilitarian approach where value is looked at on the basis of how useful the resource or ecosystem could be to humans (Hodgson 1997; Douai 2009). The concepts of "total economic valuation" (TEV), developed by Pearce, Markandya and Barbier (1989) has increasingly been used in environmental valuing (Figure 3-1). TEV encompass all use, and non-use values of a given resource (Cesar 2000; Gamborg and Fleming 2004). Bengston (1993, p.515) describes this shift in environmental values as a "new environmental paradigm" which is "challenging the longstanding constellation of values, attitudes, and beliefs" of many industrialized societies of the world.

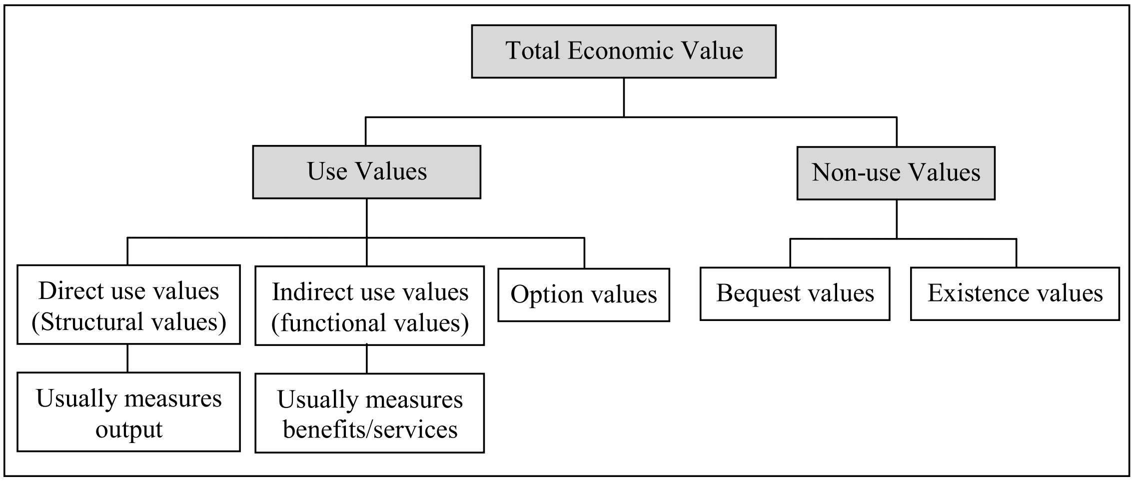


Figure 3-1 The components of Total Economic Valuation (Dixon 2008, p.2)

Figure 3-1 The components of TEV

This new shift tended to include more ecological perspectives focusing on conservation of nature (Ruitenbeek 1992; Gamborg and Fleming 2004). The recently developed concept of "nature quality" for measuring forest value is an example of such ecological importance (Gamborg and Fleming 2004). Nature quality measures the naturalness of a forest through the extent of biological and geomorphologic qualities present. Indirect uses provided by the existence of the ecosystem or resources, rather than exploitation for use, were deemed important and assigned value. Other examples include carbon storage of a forest, the protection provided by the house reef of an island and recreational use of nature.

Due to the difficulty in measuring components such as future use values, bequest values and intrinsic values many scholars find the concept of TEV as "methodologically impractical" (Reid and Boyd 2008, p.1). Nevertheless, various valuation techniques such as looking at the forgone cost of these functions and preference based elicitation techniques, researches have tried to obtain a TEV of resources and ecosystems in dollar values (Kumari 1996; O'Neill et al. 2008). For example, the protection provided by the house reef of an island could be measured by the looking at the replacement costs using artificial reef structures (Spurgeon 1998). Despite the focus on integrating economics and ecology, the main role of the TEV remained as obtaining a monetary value of environmental goods and services (Dixon 2008; Reid and Boyd 2008).

I argue that such reduction to an absolute number excludes an important facet of value; its social and cultural aspects. This ignores the many social and cultural processes in the everyday lived experiences of people. These processes undoubtedly influence people's value constructions towards their surroundings and natural resources. Traditional practices of sharing fish among neighbours and family imparts a value to fish that cannot be measured in monetary terms.

At the same time, the reduction of values to a dollar amount means that humans are viewed as outside agents acting, impacting on and benefiting from the environment rather than a part of the natural environment. Humans as part of the environment interact with nature and adapt to its challenges and unpredictabilities. O'Neill et al. 's (2008, p.1) view that "we live from them ... live in them ... and live with them" sums the depth of human-environment relations. Barry (2007) argues that these human-nature relationships are not included in the portrayal of the economic man in the dominant economic model. "[H]*omo economicus* exists neither in relationships of vulnerability or responsibility with fellow humans/citizens nor in a relationship of dependence upon the natural world" (Barry 2007, p.212). Here, Barry touches another important aspect, which is the interaction between social actors. In addition to the human-nature interactions and relationships, the interactions between social actors are important in the formation of values regarding nature and its resources. In this regard we should not be asking "What is the value of the environment or its resources"? Rather, "how does a certain community value their natural resources?" This may be in terms of their engagement for livelihood, enjoyment of nature, the social bonds it creates, as a sacred place or as something to be preserved for future generations.

Kennedy and Thomas (1995) reflect the need to incorporate social values in their view that natural resource values are constructions of the human mind which originate in the social system and are formed through human interaction with the resource. Hence, resource values are more social constructs which will differ among different societies. The same resource in fact, could hold different values for different individuals or groups. O'Brien's (2006), study focusing on how people valued forest and trees, found that people valued the forests for a variety of reasons including recreation, contributing to personal well-being and health, a source for wild foods, economic benefits from tourism and agriculture, and as a representation of identity. I am inclined to take a pluralist approach in acknowledging that multiple values exist and these could compete and conflict individually and among different actors. O'Neill et al.(2008) use the term "value conflicts" for the existence of these varying values. For example, while one may see the drainage of marshland for agriculture in terms of economic benefits, others may see it as damaging from an ecological perspective (O'Neill et al. 2008).

To incorporate social and cultural aspects of value, the ways in which communities interact and manage their resources, how they share and distribute reef resources within the community and other roles of the resource in the community should be important subjects of inquiry into the value of natural resources. These shape the values people form about the resources and at the same time their interactions with the resource also shape the values within the community. The study of environment and natural resources has been dominated by physical and natural sciences and it is quite recently that socio-economic, political and cultural processes have been incorporated into such research (Barry 2007). According to Barry (2007, p.xiii), "[t]he academic study of social theory and the environment has exponentially increased" in the last decade. Research on valuing nature has also taken a similar stride with a focus on the socio-cultural aspects of the human-environment interactions (Norton and Steinemann 2001; Rivas 2008). This change in research direction is also reflected in the changes to environmental and resource management courses offered at tertiary institutions. Emergent research areas include incorporating people's perceptions and meanings towards their surrounding or environment and social values (Norton and Steinemann 2001; Davenport 2003; O'Brien 2006).

While the interaction between environment and social theory has been developing, an increasing amount of environmental value literature is also focusing on people's concern for the environment. These valuations tend to be aimed at identifying the underlying values or value orientations that provide a basis for environmental attitudes and pro-environmental behaviour (Schultz and Zelezny 1999; Nordlund and Garvill 2002; Kennedy, Beckley, McFarlane et al. 2009). Bengston, Webb and Fan (2004) characterize these environmental value orientations as a "bipolar continuum" ranging from anthropocentric (based on use to humans) to biocentric (based on intrinsic values of nature). These underlying value orientations have been studied by scholars under names such as egocentric, or ecocentric and biospheric (Stern and Dietz 1994). I find that the labelling of value orientations into such categories isolates values and human-environment interactions from other social and cultural interactions. People do not exist as lone individuals but as stated by Barry (2007), they coexist in relationships with other social actors and in a relationship of dependence with nature . Therefore, I believe, the idea of values, especially regarding the environment, is too complex to be studied in such isolation.

These studies focusing on people's concern for the environment often show that biocentric value orientations are increasing among the public (Bengston et al. 2004). These changes mean more concern for preserving natural environments such as for their uniqueness or just for the sake of its wilderness (Cordell, Tarrant, McDonald et al. 1998). The preservation-conservation debate, popularised by the opposing views of John Muir and Gifford Pinchot, has been long ongoing (Meyer 1997). One of the main issues I have found in literature regarding conservation is that often, these terms are used interchangeably and are not well defined. In this thesis I will follow the definitions given by Hunter and Gibbs (2007, pp. 4-5); a preservationist "advocates allowing some places and some creatures to exist without significant human interference" and a conservationist "advocates or practices the sensible and careful use of natural resources". The main distinction in the two views is how the use of nature and natural resources are regarded. A conservationist view seeks to live in and use the surrounding natural resources with care. On the other hand, a preservationist view is against the use of places that are regarded as needing protection from human use.

Such conservationist and preservationist ideas though not new nor as widely distinguished as in today's societies, have existed as long as there have been human societies and civilizations (Moran 2006; Hunter and Gibbs 2007). Whether it be leaving some fish to mature so there will be more fish next season or spiritual or religious taboos which leave certain areas or animals untouched, there was no need for these to be termed as two distinct worldviews. People in their everyday lives blended the spiritual and the commonsensical.

Conservation and preservation dichotomies appear to me as human constructs as said by Cronan (1995) in his work challenging the idea of wilderness as "untouched", pristine nature. This reflects an ongoing belief in the West that nature is separate from culture. Anthropologists have long argued that such a distinction is not recognized in many non-globalised cultures (Ingold 2000; Moran 2006; McLean 2009). Ingold (2000), by using the example of hunter-gatherer societies, argues this contrast in globalised and non-globalised societies is not of differing views but that of differences in apprehending the surrounding environment. It is only in globalised thought that nature is constructed as a view while in non-globalised cultures, "apprehending the world is not a matter of construction but of engagement, not of building but of dwelling, not of making a view *of* the world but of taking up a view *in* it" (Ingold 2000, p. 42).

With the spread of globalised thought to other cultures, ideas of nature or the environment as constructs and not something we dwell in are increasing. For example, in the Maldives if you discuss the "environment" with any island community the first topics to come up would be island erosion as environmental issues. These ideas of erosion as issues have been constructed by the government and formal schooling systems. Erosion in islands is not a new occurrence and communities have lived with it as part of their everyday lives and shifted to new islands if erosion became too severe. This was part of living with nature and hence was not given the term an "environmental issue" for which extra concern need to be shown to the extent of preserving all reef systems.

Such environmental concern perhaps is a form of human construct about imagined places from people who do not permanently dwell there. Cronan (1995, p.81) views preservationist ideas from urban dwellers as conflicting with the everyday lives of rural people who "earn their living from the land". This is essentially a difference in values based on the level and type of interaction that individuals have with nature. A city dweller who can buy his food from the shops and cook his meals with electricity or supplied gas would be at leisure to have such concern for forest ecosystems but to communities that live from the forests it would be a different reality. The difference in perceptions regarding nature between those living within the environment and those residing in a distant environment has been often discussed in literature (Tuan 1974; O'Brien 2006; Turner and Berkes 2006). Ingold (2011, p. 96) describes this detachment of human from their surroundings by saying that "[e]xpelled to its [world's] outer surface, we have become exhabitants rather than inhabitants".

3.2.2 Human Values and Value-Behaviour Relations

As mentioned earlier, there is no consensus on one definition of the term value. In using the term, different disciplines reflect their particular meanings of value (Rohan 2000). This difficulty in finding a common definition for value is perhaps due to the very nature of it being a human construct, and as such, subjective. "We are rarely aware of the fact that our whole life, from the point of view of consciousness, consists in experiencing and judging values" (Simmel 2004[1907], p.57). Value as a quality of the object is not a reality but are judgements based on the interaction of subject with the object or situation to be valued (Simmel 2004[1907]; O'Neill et al. 2008).

Although finding an answer to the question as to what value really is has been challenging, scholars from various fields have attempted to define value as a concept. Some examples of value definitions used in literature are given in

Table 3-1. Each definition contains various characteristics and elements of value that help construct what value is. I will be drawing upon these various value concepts discussed here to construct a meaning of value for use in this thesis.

The definition of value used by Rokeach (1973) in his *Nature of Human Values* is one of the most widely quoted definitions of value. According to Rokeach (1973, p. 5) value is "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence." In this respect Rokeach identifies value as an evaluative belief where an object or specific situation can be judged to be good or bad or desirable or undesirable. In relation to this study this would translate to what particular things about reefs are more desired or more important to the community. Fundamentally values are unique to individuals as they are often learnt during childhood and change with the individual's experiences and social interactions (Rokeach 1973). As an individual's experiences mainly come from interaction with the community he or she lives in, members of the same culture are likely to share similar values (Kroeber 1952; Staub, Loch, Evaristo et al. 2002; Watkins 2010). Shared values have been identified in culture literature as a core component that defines cultures (Straub et al. 2002).

Table 3-1. A Selection of Value Definitions (adapted from Rohan 2000, p.257)

Theorist	**Definition**
Lewin (1952, p.41)	Values influence behavior but have not the character of a goal (i.e., of a force field). For example, the individual does not try to "reach" the value of fairness, but fairness is "guiding" his behavior. It is probably correct to say that values determine which types of activity have a positive and which have a negative valence for an individual in a given situation. In other words, values are not force fields but they "induce" force fields. That means values are constructs that have the same psychological dimension as *power fields*.
Kluckhohn (1951, p.395)	A value is a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable that influences the selection from available modes, means, and ends of actions.
Heider (1958, p.223)	We shall use the term value as meaning the property of an entity (x has values) or as meaning a class of entities (x is a value) with the connotation of being objectively positive in some way.
Schwartz (1999, p.24)	I define values as conceptions of the desirable that guide the way social actors (e.g., organizational leaders, policy-makers, individual persons) select actions, evaluate people and events, and explain their actions and evaluations.

In his work, Rokeach (1973) identifies basic human values as desired end-states (terminal values) and modes of conduct to reach these goals (instrumental values). Rokeach used empirical methods of ranking a given set of basic values to obtain people's value preferences. The methods employed in these surveys have been met with criticism such as the limited description of value terms provided for participants and the need for more in-depth interviews (Cooper and Clare 1981). I am in agreement with the idea that people are continuously making value judgements and prioritising them in order of values. Yet, the presentation of values for ranking, pre-supposes that people already find these values as important. The criticism that ranking exercises are based on pre-assumed values that individuals hold has been a main argument for the use of qualitative and interpretive methods in this research.

Rohan (2000, p.260) further finds that without an underlying theory the Rokeach Survey is "a list of unconnected value words". In terms of theory building, the work by Schwartz and Blisky (1981; 1990) has been quite influential with further theory development carried out by Schwartz (1992; 2006). Schwartz (1992, p.1), views values "as the criteria people use to select and justify actions". Schwartz (2006) identifies six main features in his development of a value theory. Values (1) are beliefs that are closely linked with affect, (2) are desirable goals that motivate action, (3) transcend specific actions and situations, (4) serve as standards or criteria that guide our actions, (5) are ordered by importance relative to one another and (6) the relative importance of multiple values guides action. Thus, Schwartz brings together much of the value concepts used in defining values.

Schwartz, using empirical methods, has inquired into how individual values are prioritized in relation to one another and also about the applicability of these basic values across cultures. He identifies ten universal value types; achievement, benevolence, conformity, hedonism, power, security, self-direction, stimulation, tradition and universalism. According to Schwartz (2006), these values are manifestations of three universal human needs. These are "needs of individuals as biological organisms, requisites of coordinated social interaction, and survival and welfare needs of groups" (Schwartz 2006, p.4).This brings us back to the idea that values are important in how they relate to humans, in this case human needs. Values as representations of human needs has been identified by a number of value scholars (Rokeach 1973; Watkins 2010).

Similar to the Rokeach Survey, Schwartz also uses methods where people are asked to rank pre-identified value terms. I share the same concerns discussed above for such empirical methods. I will focus my discussion of the work by Schwartz on the value concepts developed as they provide useful value features that help define the way that I will be using values in this research. All six features in Schwartz's value theory are linked to the value-behaviour relations that this research attempts to explore. Value theorists affirm that value as a belief has cognitive, affective and behavioural components (Rokeach 1973; Rohan 2000). In this sense value is a cognition about the desirable. It is affective in that emotion is attached to values and is behavioural in the sense that values lead to actions.

Scholars have explored how basic values lead to our behaviours through theories and models (Stern and Dietz 1994; Fulton, Manfredo and Lipscomb 1996; McFarlane and Boxall 2000). Most of these theories and models are based on the cognitive role of values and are based on earlier identified characteristics of values as ways to guide our actions. In this sense behaviours are seen as stemming from attitudes, which in turn are constructed by the projection of individual basic values and beliefs. Figure 3-2 shows a similar cognitive hierarchy model developed by McFarlane and Boxall (2000) to explore how held forest values influence more specific attitudes and beliefs regarding forest management. Basic values are seen as indirectly influencing attitudes and behaviour through more general beliefs.

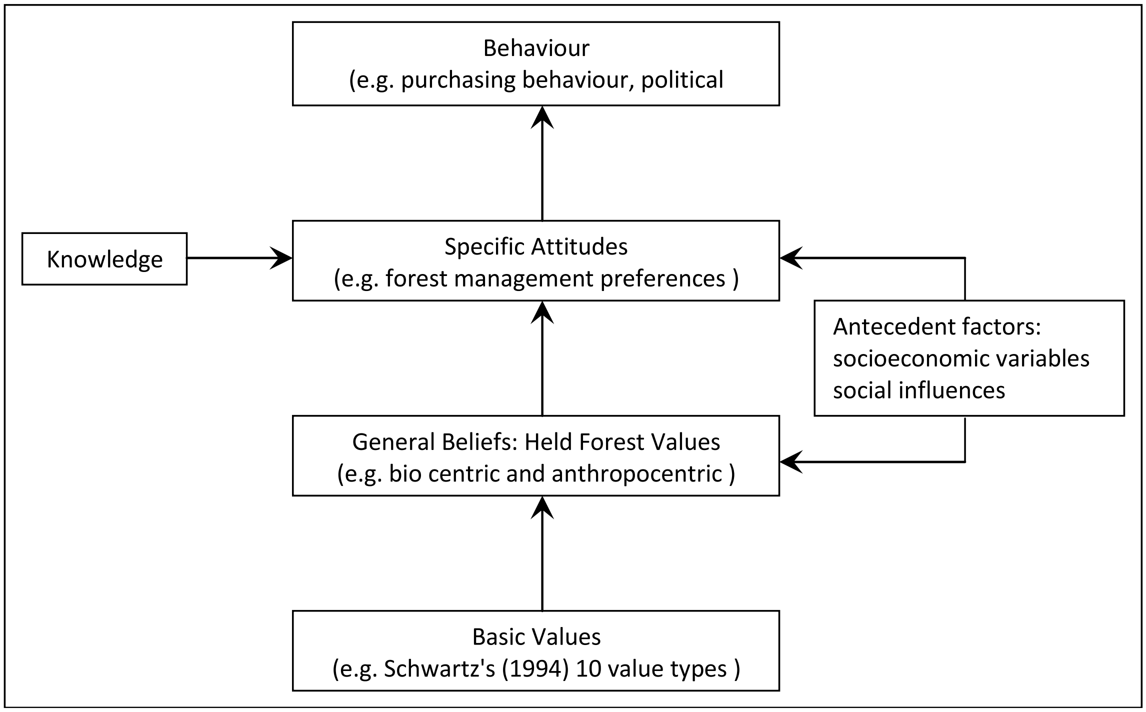


Figure 3-2 Conceptual representation of a cognitive hierarchy model of values, beliefs, attitudes and behaviour (MacFarlane and Boxall 2000, p.650)

This model is similar to the work done by Fulton et al. (1996) on values and behaviours towards wildlife and represents well the general thought of values to behaviour. General beliefs or held values are also identified as value orientations. Two types of held values are generally discussed in the literature. These are often referred to as instrumental, values associated with human needs and wants, and intrinsic, values based on the worth of a thing regardless of its usefulness to humans (Bengston 1993). Others have used terms such as anthropocentric and biocentric respectively (Stern and Dietz 1994; McFarlane and Boxall 2000).

More recent research into value-behaviour relationships are critical of the use of these held values as being abstract and conceptual and not specific (McIntyre, Moore and Yuan 2008; Seymour et al. 2010). Held values tend to be not so much regarding objects or situations with which individuals have contact with but are more like the concern shown for imagined places. Held values are more desired end-states such as people's desire to see wilderness as untouched nature. Critics of held values have been looking into assigned values, those that an individual attaches to physical objects, goods and services, are seen as a more useful for looking at specific sites (McIntyre et al. 2008; Seymour et al. 2010). Assigned values may be more useful in terms of looking at values that Maldivian communities attach to the reefs which they interact with on a daily basis and are not imagined places. Figure 3-3 shows such an assigned value model proposed by Seymour et al (2010).

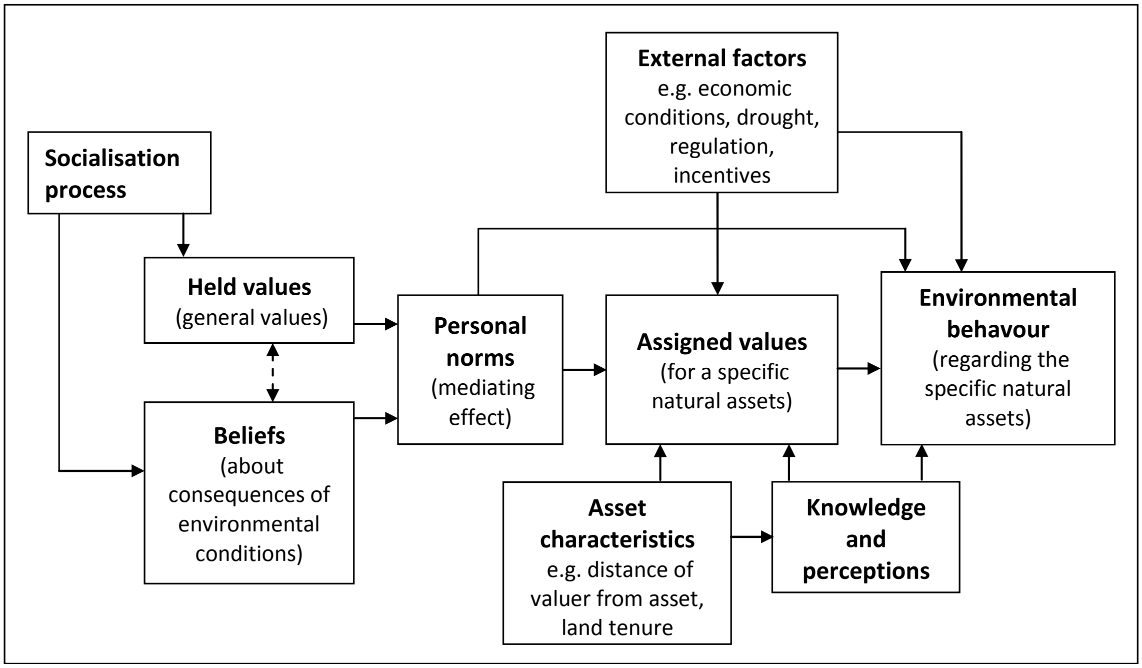


Figure 3-3 Assigned value model (Seymour et al. 2010, p. 149)

#?? In reference above? – you need to do this for all the figures you've taken from other sources

This model shows that "assigned values are influenced by a complex series of interactions between held values, beliefs about the consequences of environmental conditions, and personal norms" (Seymour et al. 2010, p.149).The model draws heavily upon value-belief-norm theory proposed by Stern, Dietz and Kalof (1993). Similar to the cognitive hierarchy models, this also follows a values to behaviour flow of effects, but acknowledges the complexity of these relationships by showing how one component influences the other.

However, I find that neither model demonstrates how values themselves are influenced by actions or behaviours. In defining value concepts for this research, it is an important relation that behaviours are influenced by and influencing values. This further represents the complex nature of these relations between two extremely complex subjects; human beings and nature. This complex nature is acknowledged by O'Brien (2003) in her attempts at representing how values are formed (Figure 3-4). Although in the work it is not specifically stated, I am of the understanding that value discussed by O'Brien is assigned values rather than held values. This can be further interpreted from the work by O'Brien (2006) to understand what trees and forests mean to people.

While the value literature is rich in theories and models on the value-behaviour relations there are those who find that values do not actually predict environmental behaviour (Kennedy et al. 2009). I find that such work is mainly based on simplified representations of value-behaviour models which do not consider the complex processes involved in value formation. As O'Brien (2003, p. 7) argues such work focuses on "what can be measured and tested in order to arrive at the explanation and prediction of social phenomena". For example, many such studies analyse stated values and commitment to the environment of people who may not be necessarily living in these environments (Bengston et al. 2004). I believe that the findings of mismatches in value and behaviour are due to such assumptions that simple causal relationships can be measured and tested for complex human-environment interactions.

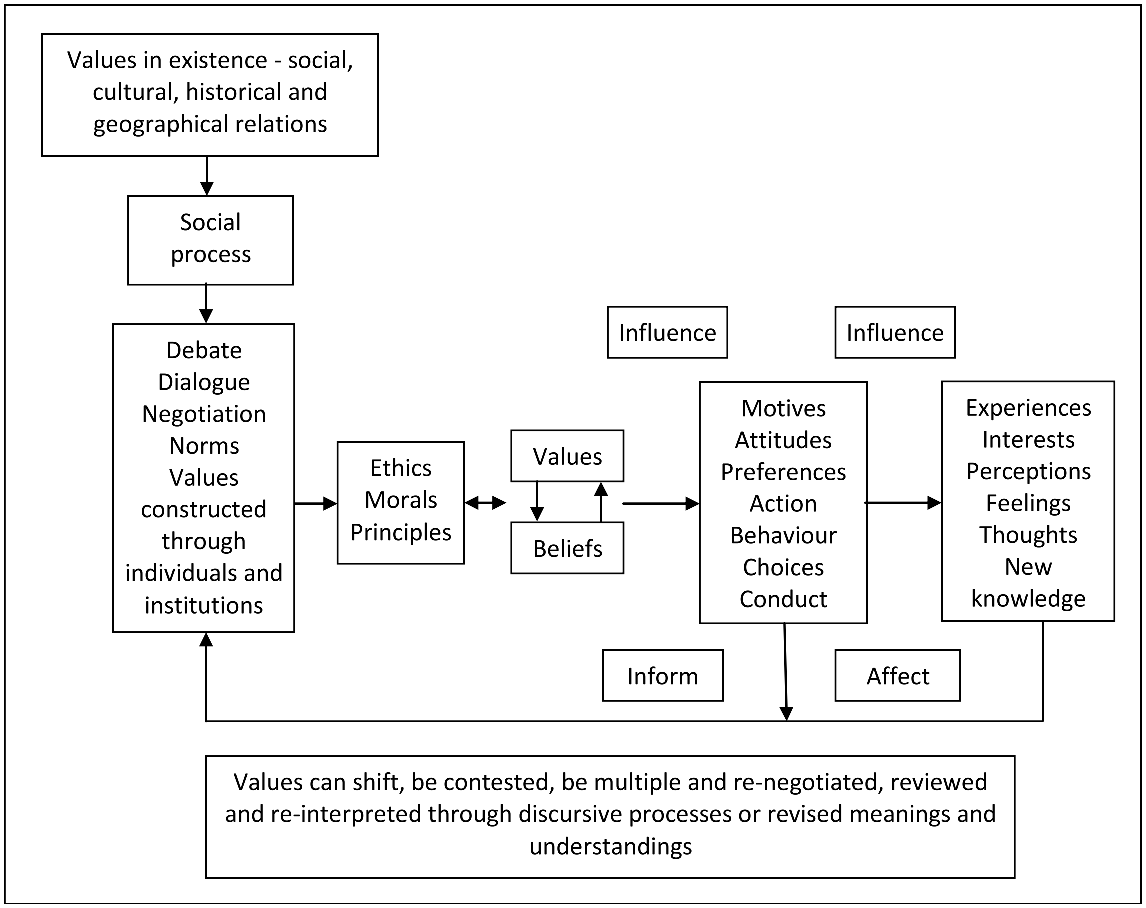


Figure 3-4 Schematic representation of value relationships (O'Brien, 2003, p. 5)

O'Brien's (2003) criticism that positivist approaches to environmental valuations do not look into the whole social and cultural aspects of people's lives bring to light the fact that many of the value-behaviour models do not consider the more underlying moral beliefs of individuals and communities that contribute to values and in turn their action and behaviour. For example, O'Brien (2003) identifies ethics, morals and principles as important contributors to value formation. In many traditional cultures, religious or spiritual beliefs play an important part in their interaction with their natural surroundings. The different worldviews and how these incorporates values, ethics and beliefs into human-environment interaction are important aspects in areas of literature such as traditional ecological knowledge and ethnoecology. Berkes (2012 [1999], p.106) describe Cree belief systems or religious ideology in which "the living environment is a community of beings that are supernatural as well as natural". The interactions with this living environment are rooted in morals of respect and reciprocity (Berkes 2012[1999]). These bodies of literature would be important in understanding the ways the Islamic beliefs of traditional Maldivian communities influence their community values and values towards reefs and reef resources.

Ethnoecology uses an approach that explores how nature is perceived by humans through a screen of beliefs [kosmos], knowledge [corpus] and how humans use these to manage [praxis] natural resources (Barrera-Bassols and Toledo 2005). Using the case of the Yucatec Maya, Barrera-Bassols and Toledo (20005) argue that the three spheres, kosmos, corpus and praxis, are inter-linked and operate together in people's appropriation of nature. These beliefs hold the value components and as in the example presented in the Yucatec Maya, there is no separation between the material and sacred values (Barrera-Bassols and Toledo 2005). In relation to land, material values represent benefits such as food and housing while sacred values relate to things such as a home or sense of place, a cultural identity and a place of final destiny. These discussions of value represent assigned values. Knowledge in the kosmos-corpus-praxis belief system represent the TEK that communities hold.[1] I find appealing that the whole system of beliefs-knowledge-practice is analysed together, thus acknowledging the complex relations between these spheres. In both ethnoecology and TEK systems worldview is seen as important in shaping how we interpret and make sense of our natural surroundings. "Our view of the world and the universe and how we relate to them is the *source* of our values, our cosmology" (Berkes 2012[1999], p.74).

Having looked at the different discussion on human values, its nature and how it relates to our behaviours I find the factors identified by Schwartz (2006) to be quite useful in understanding and applying value concepts. I argue that human values, especially in relation to natural systems are complex. In the context of this study I would be using values as an enduring concept of worth which is formed through an individual's interaction with the social and physical environments he or she resides in. As such values are socially constructed and dynamic in nature, changing with new experiences and new interactions (O'Brien 2003). In addition, a firm basis of this thesis is that values are the "various considerations that enter into our deliberations about action" (O'Neill et al. 2008, p.1). I am inclined to agree with Seymour et al. (2010, p.144) that assigned values offer the "potential to increase our understanding of community perceptions of their local landscape".

---

[1] I note that both cognitive hierarchy and assigned value models identify knowledge as an important factor contributing to behaviours.

While values influence our attitudes and behaviours, these in turn can impact the formation of values. The use and management of natural resources within communities often help create social values and norms. These social processes will need to be explored to understand the formation of the community values regarding reef resources. Therefore, in the next section I review the literature relating to the use, exchange and sharing of resources within communities.

3.2.3 The Economics of Value

The various theories and models of value-attitude have been formed on the basis that people's basic values guide their attitudes and behaviours. Therefore, on this basis the many interactions that Maldivian communities have with their reef resources are a reflection of how they value these resources. The formation of values are further affected by people's actions and behaviours (O'Brien 2003). An act of sharing fish or community members helping to build another's house are interactions that build social relations and ties. Community values are created within these social processes. The links between values and these social process are complex, each contributing to the other. It is imperative that a study of values should examine the economics of values. How are values formed through the extraction, consumption, exchange and distribution of goods and services in communities? How does value change or evolve through processes of exchange within and among the communities?

Before I embark on this discussion, I would like to be clear as to how the term "economics" is used in the context of this research. Economics is used in the traditional sense as the study of how human societies organize the production, distribution and consumption of goods and services from their social and natural environment (Rodrigo 2011). For Polanyi economic systems do not exist as separate from the other aspects of the society but is embedded in institutions both the economic and the non-economic (Boldeman 2007). In the context of this research I find this substantivist view quite relevant, as for Maldivian societies, the economic aspects of living in and from the environment are very much entwined with the everyday social and cultural processes of the community. "Custom and law, magic and religion co-operated in inducing the individual to comply with rules of behavior which, eventually, ensured his functioning in the economic system" (Polanyi 1980[1944], p.55). At the same time, in using the term economics, I am in agreement with

Gudeman's (2001; 2008) argument that there cannot be one universal model of economics that fits all societies but rather can be understood as a combination of communal and market forces. Therefore, the economic processes within a community needs to take the culture of that society as a significant variable when determining how economic interactions affect the value of environmental resources as perceived by that society.

3.2.3.1 Use Value, Exchange Value and Commensurability

Since Aristotle first distinguished between "use value" and "exchange value", these terms have been discussed in detail by philosophers and economists such as Adam Smith and Karl Marx (Marx 1996[1867]; Vargo, Maglio and Akaka 2008). Smith (2005[1776]) uses the terms "value in use" and "value in exchange", respectively. According to these scholars, the use value of an object is based on its quality as a utility (Marx 1996[1867]; Vargo et al. 2008). Aristotle further observes that it is the demand for a good or service which creates its use value and this may vary from individual to individual (Younkins 2005). In contrast, exchange values are thought of as "a quantitative relation, as the proportion in which values in use of one sort are exchanged for those of another sort" (Marx 1867/1996, p.26). Exchange value is created when there is a need by another (Younkins 2005; Watkins 2010). Thus, it is use value which is being converted to exchange value through need. Reef resources in the Maldivian communities are continuously changing between these two value states. Fish may be eaten together in a shared meal among family, it may also be exchanged between neighbours and sometimes goods of one kind may be exchanged for another kind. As a norm these are unaccounted reciprocal exchanges like those described in "gift economies" by scholars such as Mauss and Sahlins; a discussion of which will follow later in this section.

Exchanges does bring with it issues of commensurability. "'Exchange' cannot take place without equality, and equality not without commensurability" (Aristotle in Marx 1996[1867], p.39). How much of Good A is equal to what quantity of Good B? The way value equivalence is looked at depends on the types of exchanges as well as the community. Different cultures have looked at this in different ways and historically a variety of objects have been used as a form of common exchange. Maldivian communities have traditionally used cowrie shells and dried tuna as a measure for exchange. Likewise, cattle, shells, salt and metals have also been used as earlier forms of common exchange (Menger 2009).

Aristotle deliberated over "money" and "need" as value equivalents in exchange but found that need lacks a unit of measurement until money is introduced (Younkins 2005; Vargo et al. 2008). Money itself was problematic as it is an "expression of the value of one commodity in some other commodity taken at random" (Marx 1996[1867], p.39). Smith and Marx had both approached these issues of value equivalence in terms of human labour. For both human labour is what creates exchange value. While issues in measuring labour caused Smith to focus his efforts on commodities and monetary values, the clear identification of labour as the measure of value by Marx has been met with criticisms based on subjectivity of value. Vargo et al. (2008), present this subjectivity the example of an automobile; in the first view the value of the car is that a firm has input into the production of a car from raw materials but in a second view if there were no demand for the car by customers the production does not hold a value. These issues to me highlight the difficulty, if not impossibility, of measuring value as an absolute form. Many would argue the existence of the money form of value equivalence does solve this issue, but I believe this to be a distinction between the price and value of an object. Thus, I reiterate the importance of qualitative explorations of value.

Similarly, the value of reef resources to a community cannot be obtained from the monetary value only. A qualitative inquiry would be more suited to go into the depths of understanding the various ways that these resources are valued by the people. Even so this may not give an absolute value as it is not possible to understand the various constructions of value by the different social actors. In this attempt to understand people's values towards reefs and reef resources, I do not claim to find one true value of reef resources. I believe this is to be an impossibility as there would be multiple values originating from even one single resource.

Another criticisms of the Marx's labour theory of value has been its applicability only to a capitalist society (Cafentzis 2011). Is this applicable in the sense of small traditional communities? How is labour related to value in traditional Maldivian societies where island communities exist as small-knit groups related by kin or marriage? Labour, like other goods and services, often gets exchanged without a prior accounting of when and by how much to be returned.

3.2.3.2 Gifts, Reciprocity and Commodities

Exchanges based on reciprocity and personal relations are described as a "gift economy" by economic anthropologists (Mauss 1966[1923]; Sahlins 1972). In his development of the concept of the "gift", Mauss (1966[1923]) identifies that such exchanges occur in societies which have not yet reached the stage of market based economies. This work by Mauss has stirred further interesting discussions looping around concepts of gifts, reciprocity and commodities. These concepts are central to an understanding of values that communities hold in their use of resources from the surrounding environment.

For Mauss (1966[1923), the exchanges that occur in gift economies are social contracts where the act of giving creates a social bond on the part of the receiver to reciprocate the gift. Thus, Mauss embodies gift exchanges as three obligations, the giving, the receiving and the repaying. Reciprocity in such societies does not necessarily occur as exchange of similar goods or services or as accounts necessarily settled in the instant. While Mauss emphasises the obligatory nature of the gift, others such as Malinowski (1960[1922]) have elaborated on the idea of "pure gifs" intended to create social ties and as such "an open stipulation of return would be unthinkable and unsociable" (Sahlins 1972, p.191). Such examples of pure gift exchanges are numerous in everyday island communities in the Maldives. These are often present in oral traditions of stories and expressions. I have grown up with this popular saying that if a person hears her neighbour scraping the last scoops of rice from the pot, she would immediately take a bowl of rice to the neighbour.[2] These gestures do reciprocate similar exchanges but is more in the sense of Sahlin's (1972) generalised reciprocity where the giving of a pure gift may involve the return of an assistance, in some non-bound timeframe, if needed. The social structure of Maldivian societies is similar to kinship societies where Sahlins identifies such exchanges as mainly occurring.

In his work on primitive economies, Sahlins (1972) identified reciprocity as continuous ranging from the exchange of the pure gift to negative exchanges. Negative

---

[2] Traditionally, houses in island communities are built in a small, close knit-fashion and often kitchens would be adjoining. It is very easy to hear the goings on in the other kitchens. I observed in some islands that when people are cooking in the kitchen they would sometimes have conversations with their neighbours through the kitchen wall.

exchanges are attempts to get something for nothing like in the case of theft. The degrees of separation on this continuum are identified more by social factors such as social distance and kinship. One such exchange that Sahlins (1972) identifies is balanced reciprocity which involves the exchange of similar values goods or services at the instant. Historic accounts from travellers to the Maldives often narrate such balanced exchanges occurring between Maldivian communities and foreign traders. Items such as dried tuna, coir, cowrie shells and sweetmeats are exchanged for staples and other essentials. As Sahlins identifies these exchanges are less personal and often occur outside the community. For example, the success of Chinese traders in Malay communities is often identified as due to their ideal placement as outsiders with less personal and kinship interactions (Carsten 1989).

I find the use of gift exchanges in literature confusing, in application to my research, as the literature often does not make distinctions between the giving of pure gifts and reciprocal exchanges. For this reason Gudeman's (2001), separation of the two is very useful. Gudeman distinguishes a gift as one which is given for the sake of giving and its purpose more to build social relations than the expectation of another in return. Reciprocity involves other exchanges which occur within the community where exchanges are not necessarily equal or immediate. Goods and services are often exchanged when a need arises by another without a set time of return.

Much of the work relating to gift economies focuses on so-called "primitive societies" and, as stressed by Mauss (1966[1923]), those where market economies do not exist. Today's communities are far from this. Exchange of commodities in market exchanges are seen "as the cause of improved living standards" (Gudeman 2001, p.11). Many, especially the earlier generations in Maldivian communities echo the concern that the introduction and development of market economies caused the destruction of traditions based on social relations. The introduction of money and its ability to purchase goods and services are viewed as obliging people to account for exchanges measure for measure. Polanyi had discussed the idea of similar devastating transformations in society when economies become disembodied from their social relationships (Gudeman 2001).

It is a fact that most societies today exist within these two realms of exchange; the gift and the market (Kopytoff 1986/1998; Parry and Bloch 1989). Terms such as different "spheres of exchange" and "transaction realms" are among those used to describe this co-existence. Gudeman (2001) in his development of a cross-cultural model of economy identifies these as "community" and "market realms", respectively. I find this distinction more clear as community realms includes both gift and reciprocal exchanges. These two realms have been distinguished mainly on the relations between those involved. Parry and Bloch (1989, p. 24) describe market exchanges as being more impersonal and often occurring between "independent" transactors as opposed to exchanges between "interdependent" transactors in a gift exchange. While the former is regarded as short-term transactions concerned with individual competition the latter corresponds to ensuring long-term social and cosmic order in communities (Parry and Bloch 1989, p. 8).

Scholars studying the economic exchanges that occur in such communities have found that distinctions between these realms are not so clear. The exchanges cross boundaries and interactions occur across the spheres too. Goods and services are continually moving in and out of commodity state and people are continuously trying to make sense of the place of goods in these two spheres of exchange (Appadurai 1986; Kopytoff 1986/1998; Gombay 2009). People adopt and adapt to these changing states and have developed ways to keep each in its place ensuring the lasting of long-term social interactions within the community. Fishermen will sell their fish within communities but would still give consideration to the social ties of kin and friendship within community members. It is a delicate balancing act between the gift and the commodity.

3.2.3.3 Value and Money

The discussion of use and exchange of goods and services and the ways societies have changed over time all include in various forms the need to measure exchanges in some common form. From Aristotle to Marx discussions of exchange have focused on how an object could be valued in terms of another. According to Marx (1996[1867]) a common form of commensurating objects is by the use of the "money form". In the context of this study money and the ways in which it has impacted the social and economic interactions in the communities is important. Has money impacted the interactions related to reef resources and how it is valued by communities?

Essentially all deliberations over money and its various functions are deliberations about value. This is whether it serves effectively as a means of exchange, a method of payment, a store of wealth or a unit of account (Maurer 2006; Simmel 2004[1907]). Parry and Bloch (1989) cautions scholars on the need to understand clearly the way in which money is symbolised in different cultures and linked to culturally constructed notions of production, consumption, circulation and exchange.[3] Elders from the Maldivian communities, who have seen and lived through the introduction of money, have found many changes in the ways reef resources are produced, consumed, circulated and exchanged in the communities. Today, sand for building a home can be purchased from the community sand miner, but earlier, groups of family, friends and neighbours provided reciprocal labour and time to get the sand and build homes. This does raise the other money question of this study. Can money, with its functions of purchasing power and universal value equivalence, correctly capture these social values? Maurer (2006, p.24) deliberates over this as a potential research question in asking "[d]oes number actually always permit 'a generalized abstraction of value across otherwise incommensurable domains'".

The more I have immersed myself in an inquiry of values the firmer has become my belief that values cannot be studied as incidents isolated in place and time. Similarly, money, its meanings and relations to value, cannot be studied in isolation (Guyer 2004; Maurer 2006). Guyer (2004) emphasises this in her discussion of Bohannan's spheres of exchange among the Tiv. "[O]ne can simply lift off the boundedness of the model [of spheres of exchange] and connect each sphere to its regional trading networks, to see not barriers [between spheres] but institutions that facilitated asymmetrical exchanges across value registers" (Guyer 2004, p.28). Similar ideas are brought forward in Parry and Bloch's (1989, p.23) focus on "whole transaction systems".

Money as a cause for the great transformation in societies and its link to ideas such as the root of all evil, as has been discussed by earlier scholars, is not as evident in today's Maldivian societies. The elders who fondly reminisce about times when money was not present in the communities still find money useful in their adjustment to present living. Most elders, who are not able to work as they used to, find that money gives a sense of less dependency on others, especially their children. Hence, many opt to combine leisure activities such as fishing with earning a bit of money. They are continuously trying to make a

---

[3] This brings to mind how my own perception of physical money has changed with my immersion in different cultures; from the uneasy fear of holding, such precious, tangible notes to the comfortable handling of invisible automated money stored in a plastic card.

balance between monetary exchanges and the more personal social relations. These acts of balancing are at the heart of Parry and Bloch's time scale of monetary transactions; short-term and long-term. "Money determines the morality of exchange only insofar as previously existing moral orders maintain, in the long run, their durability in the face of short-term individual competition" (Maurer 2006, p.19). In this aspect, people adapt and adopt to make sense of money within their particular worldviews. Toren (1989) describe how in Fijian communities the giving of money for goods and services are made acceptable by giving it in the form of a gift rather than by naming a price. Many scholars have found Parry and Bloch's (1989) introduction of time, short-term and long-term transaction orders, useful in understanding how cultures make sense of the place of money in the larger scheme of cultural and social interactions (Maurer 2006).

As can be seen from the various literature on value, it is a complex subject. Any study of the human perceptions cannot be but complex. It would be an impossible task to undertake if one attempts to understand all the various formations of human value. Each interaction, economic or social, within a community add to the individual's construction of value regarding the particular natural resource. Despite the impossibility of finding one absolute value, it is by no means a reason to refrain from such inquiry. Each bit of knowledge gained adds to an increased understanding of people's values towards their surrounding environment and its resources. In the Maldives, it is the surrounding reefs which are vital to the everyday living and livelihood of the communities. As the reefs are considered to be a common pool resource I thus move on to present a discussion of the literature on common pool resources.

3.3 Common Pool Resources

Maldivian communities view the sea, reefs and their resources as a common pool resource to be used by all communities. Such views can be seen by people's beliefs that the sea does not belong to a particular person. Similarly, resources within the house reef of islands are seen as a common pool resource based on their characteristics of non-excludability and subtractability. This means it is difficult to exclude potential users of these resources and the use of the resources by one user diminishes the availability to other users. Therefore, I believe the theories of common pool resources and its management are very relevant in order to understand the management of reef resources in the islands.

It is extremely important to start any discussion on commons literature by clarifying the use of the terminology, as various authors make somewhat synonymous use of the terms, commons, common-pool resources, common property and similar terminology. The many terms and concepts used in the literature could be distinguished on the basis of those focusing specifically on the social institutions around these resources, and those relating to the physical properties of the resource. Bromley (1986) argued that the term "property" is indicative of human made arrangements or institutions to manage the resource, rather than a physical attribute of the resource and hence "common property" or "common property regime" was more appropriate terminology here. This reasoning finds the term "common-pool" more suitable when referring to physical properties of the resource (Dietz et al. 2002).

According to Dietz et al. (2002), the term "common property resources", which has frequently been used even in highly publicised events and newsletters, has added to the confusion in the commons terminology. Throughout the thesis I would be consistent with the arguments given above and use common property when referring to the management regimes and use common-pool when referring to the resource itself.

3.3.1 Property Rights, Rules and Management Institutions

The study of common-pool resources has gained much momentum since Hardin's (1968) work on the "Tragedy of the Commons". Hardin's work was based on the idea that individual's will act in their own self-interest rather than the benefit of the community. This is demonstrated by Hardin's example of herdsmen grazing cattle on a common pastureland. He theorised that if an individual put extra cattle into his herd, the benefits from this increase will be to the individual alone, but the cost of the extra cattle using the pastureland will be shared by all other herdsmen (Hardin 1968). Hardin (1968) hypothesises that such self interest when displayed by all the herdsmen will undoubtedly lead to a destruction or depletion of the pastureland and hence a tragedy. Hardin's work, combined with stories of rapid declines in certain species, led to an interest in common-pool resources and their management.

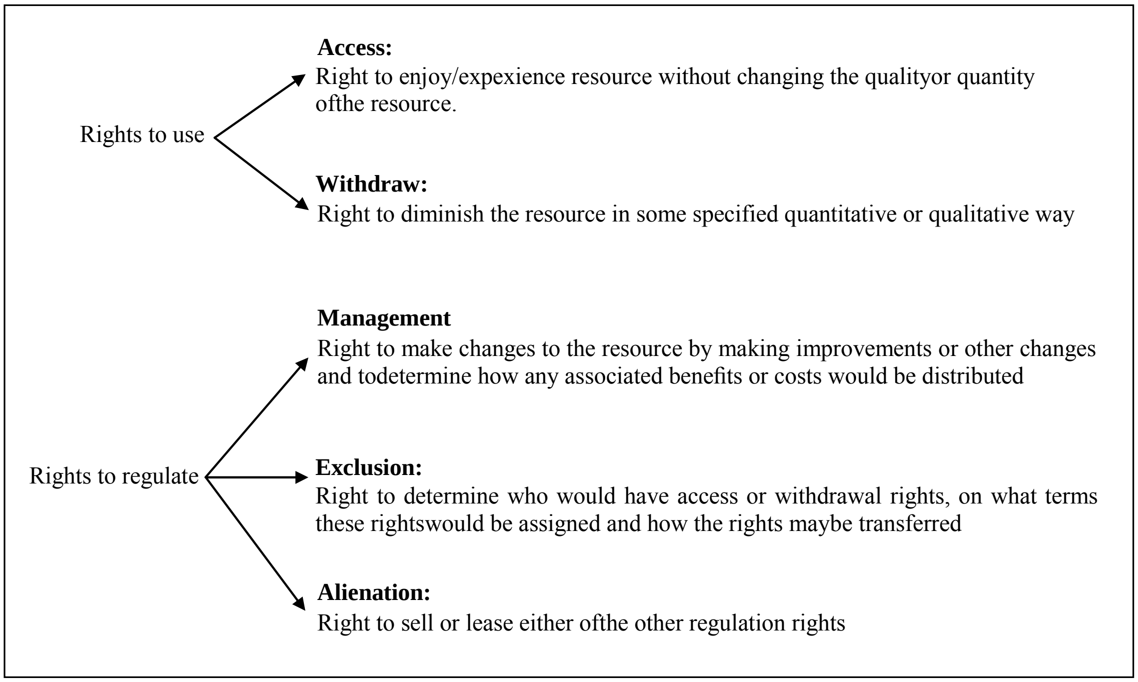
Through the 1970s to early 1980s, Hardin's work was much challenged, especially with the emergence of examples from the field of local communities which have been sustainably using and managing common-pool resources. One of the major criticisms was that Hardin takes a common property situation to mean an open-access condition where there are no rules on the use of resources. As stated by Ciriacy-Wantrup and Bishop (1975), common property does not mean it is everyone's property. Most researchers agree that resources used under a common property regime are characteristics of a long-term history of use and a set of commonly understood rules governing the use of the property (Hanna and Jentoft 1996; Dietz et al. 2002). Therefore, communities have an incentive not to over-use the resources. Some of the field examples showed cases where resource conditions of community managed common-pool resources got worse when the management was changed to government property regimes (Dietz et al. 2002). In these cases the cause of the degradation was due to a lack of enforcement which came with the change and hence, the situation became more like Hardin's open-access scenario.

An important aspect that I draw from Hardin's work and its subsequent critique is that some form of "rules" and "rights" are needed for successful management of common-pool resources. Similarly the natural direction for research on the commons was to find out what type of arrangement was better for sustainable management of common-pool resources. The commons literature does agree that property rights and rules need to be clearly defined to prevent overexploitation of resources (Baland and Platteau 1996; Yandle 2007). Such rights and rules are created either by the users through informal consultation and negotiations or governments which delegate the rights to users. These factors which determine the dos and don'ts of management are known as management institutions (Quinn, Huby, Kiwasila et al. 2007). These could be either those devised by society and formalised by law or less state-sanctioned codes of conduct and behaviour that are passed down traditionally and are learnt through repeated interactions in society (North 1990).

The appropriate use of terminology has been a recurring theme within the literature on the commons. The use of the terms rights and rules is not exempt from this, and hence it would be appropriate to define the use of these terms within this research. Schlager and Ostrom (1992) recognize rights as the product of rules and hence, are not equivalent to rules. A property right is an enforceable authority to undertake certain actions and every right is associated with rules that allow the exercising of that right (Ostrom and Schlager 1996). For example, if fishermen hold rights to access a fishing ground then the requirements, such as a fishing license, that are needed to exercise the right are known as the rules.

Within the literature, four main types of property rights regimes are identified. These are (i) private property, (ii) common property, (iii) government property and (iv) open access. These are mainly distinguished by who possesses the authority to take particular actions in a given domain (Schlager and Ostrom 1992). In the case of private property these rights are exercised by a single individual whereas for common property the rights are held by a specific group. In the case of government property, the rights can be exercised by varied levels of the state ranging from a county to the national level. Open access is a case where no rules on use of the resource exist and all comers can access and use the resource.

Often, a hybrid of one or more property rights regimes may exist for a resource. The degree of control of each right often varies among different groups. Ostrom and Schlager (1996) describe these degrees as a grouping of five operational level rights, termed "property rights bundles" (Figure 3-5). Some rights may be shared by different groups and in other cases different groups may exercise different levels of control over a resource (Starrett 2003). For example, in the Maldives the government holds the rights of exclusion of MPAs. While, both fishermen and divers have rights to access these MPAs, only fishermen have the right to withdraw baitfish from the MPAs (Mohamed 2007). Yandle (2007) examines three more characteristics of property rights, termed "property rights dimensions". These dimensions, spatial, temporal and quantitative respectively, define the location or boundary where the rights are exercised, the timeframe applicable for the rights and the amount of resources that can be extracted in the given timeframe.



Access:
Right to enjoy/expexience resource without changing the qualityor quantity ofthe resource.

Withdraw:
Right to diminish the resource in some specified quantitative or qualitative way

Management
Right to make changes to the resource by making improvements or other changes and todetermine how any associated benefits or costs would be distributed

Exclusion:
Right to determine who would have access or withdrawal rights, on what terms these rightswould be assigned and how the rights maybe transferred

Alienation:
Right to sell or lease either ofthe other regulation rights

Figure 3-5 Property rights bundles

Undoubtedly research is well underway to determine which regime is most effective in sustainably managing its resources. The literature shows that the school of thought on this question was very much polarised. The popular belief among environmental policy makers and some scholars, as late as the 1980s, was that markets and states were the appropriate institutions for management of common-pool resources and common property regimes were thought to be primitive and "…a curious holdover from the past that was destined to disappear in the face of trends toward modernization" (Agrawal 2002, p42).

The other school of thought is that common property regimes are more effective systems of resource management and allow for more sustainable use of the resources (Johannes 1981; Begossi 1995; Acheson and Wilson 1996; Ruddle 1998a; Ruddle 1998b). Some authors have reported cases where centralised control of natural resources have been shifted back to common property regimes (Agrawal and Gibson 1999; Walsh 2000; Quinn et al. 2007).

Baland and Platteau (1996) present well balanced findings for this debate. They find that when private property regimes are compared with regulated commons management, they are both equally efficient in terms of sustainable resource use. With the exception of open access, the other three property regimes have cases of success and failure (Berkes 2005). The balance of arguments indicates that one management regime is not superior over the other. Rather, the correct combinations of factors in a given situation make a regime successful, while it may not be appropriate for another situation. The factors which contribute to successful management of common pool resources is currently a main focus in the research on common pool resources. Various authors use different criteria to define successful or sustainable institutions. Some have looked at the ecological characteristics of the resource (Gautam and Shivakoti 2005). I find that these definitions based on ecological characteristics do not fully take into consideration the human-environment interactions. More recently researchers focus on the linkages between humans and environments as social-ecological systems thus, emphasising the inclusion of human-environment linkages (Berkes, Colding and Folke 2003). In taking these linkages into consideration, the definition of success by Ostrom (1990) and Agrawal (2002) as how long the institutional arrangements have survived and have been successful in managing its resources seem more relevant.

According to Agrawal (2002), there is no universally accepted theory of what contributes to successful management of common-pool resources. Despite this there is increasing evidence that resources are more effectively managed when users of a common-pool resource organise among themselves to manage and use the resource (Tang 1992; Wade 1994[1988]; Baland and Platteau 1996; Ostrom 2000; Regmi 2008). Ostrom (1990) uses the term "design principle" for the factors needed for successful institutions and I will continue the use of that term within this thesis. Agrawal (2001) looks in detail at the significant work done by Ostrom (1990), Wade (1994[1988]) and Baland and Platteau (1996). Based on these and other studies Agrawal (2001) had identified more than 30 design principles which he categorizes into four groups: (1) resource system characteristics, (2) resource user characteristics, (3) institutional arrangements and (4) external environment, with interactions between (1) and (2) and (1) and (3). Table 3-2 includes a full list of these design principles. These design principles will be used in analysing the ways that Maldivian communities have organized to manage the resources within their house reefs.

Table 3-2 The Grouping of Design Principles for Sustainable Commons Institutions (Agrawal 2001, p.1654)

1. Resource System Characteristics i. small size (RW) ii. well defined boundaries (RW, EO) iii. low levels of mobility iii. possibilities of storage of benefits from the resource iv. predictability
2. Resource User Characteristics i. small size (RW, B&P) ii. clearly defined boundaries (RW, EO) iii. shared norms (B&P) iv. past successful experiences in community organisation – social capital (RW, B&P) v. appropriate leadership – young, familiar with changing external environments, connected to local traditional elite (B&P) vi. Heterogeneity of endowments, homogeneity of identities and interests (B&P) . vii. low levels of poverty
(1 and 2) Relationship between resource system characteristics and group characteristics i. overlap between user group residential location and resource location (RW, B&P) ii. high levels of dependence by group members on resources (RW) iii. fairness in allocation of benefits from common resources (B&P) iv. sufficient knowledge of sustainable yields (RW) v. gradual change in levels of demand
3. Institutional arrangements i. Rules are simple and easy to understand (B&P) ii. Locally devised access and management rules (RW, EO, B&P) iii. Ease in enforcement of rules (RW, EO, B&P) iv. Graduated sanctions (RW, EO) v. Availability of low-cost adjudication (EO) vi. Accountability of monitors and other officers to users (EO, B&P)
(1 and 3) Relationship between resource system characteristics and institutional arrangements i. Match restrictions on harvests to regeneration of resources (RW, EO)
4. External environment i. Technology a. Low-cost exclusion technology (RW) b. Time for adaptation to new technologies related to the commons ii. Low levels of articulation with the external market iii. Gradual change in articulation with external markets iv. State a. Central governments should not undermine local authority (RW, EO) b. Supportive external sanctioning institutions (B&P) c. Appropriate levels of external aid to compensate local users for conservation activities (B&P) d. Nested levels of appropriation, provision, enforcement, governance (EO)
Abbreviated Sources: RW- Wade (1988); EO- Ostrom (1990); B&P- Baland and Platteau (1996)

As pointed out by Agrawal (2001), some important resource characteristics such as mobility and storage capability had not been looked at by the authors. These are important characteristics of reef resources such as fish. Marine resources, due to their mobility and unpredictability are often in danger of being opportunistically extracted (Pollnac and Johnson 2005). The mobility of the resource would also complicate problems of excludability and subtractability and hence make management of these resources more challenging (Berkes 2005). Although the house reef in Maldivian islands provide a clear boundary which makes management easier, the mobility of fish still provide an interesting management challenge.

Many of the theories on common pool resource focus on humans as rational actors looking to maximise their individual or collective benefits. Such reasoning may not make sense at all times of how individuals and communities act and manage their surrounding resources. In the earlier review of value literature, I found that developments of value-behaviour models also fail to include the underlying morals and beliefs which contribute to behaviour. I find a similar gap in the commons literature as much of the theories focus on understanding the management of common pool resources through game theory and rational choice. I do note that Baland and Platteau (1996) introduces and discusses the role of moral norms obligation in the successful management of common pool resources. These discussions also use moral norms as a factor that contributes to the rational reasoning of resource users. Baland and Platteau (1996, p. 116) describes moral norms "as a binding constraint limiting the choices of a maximizing self-interested individual while, ... they play an important role in shaping individual preferences."

I believe that moral reasoning as an alternative approach to making sense of people's behaviours needs to be explored further in the commons literature. For example, a main problem in management of common pool resources has been the issue of free-riders and the inability to exclude them from using the resources (Tang 1991; Ostrom, Burger, Field et al. 1999). Traditional Maldivian beliefs that all resources are a provision from God and that it should be used with care without taking from that provided for others seem to be rooted in the use of reef resources by communities. This in itself I find to be a moral reasoning to reduce free-rider problems that is discussed in common literature.

A common property regime is distinct from an open access regime as there are well established management institutions governing the use of common pool resources. These include both informal ones which are accepted by common understanding and those institutions established through formal processes of legitimizing. As given in Table 3-2, many scholars have worked on understanding what factors contribute to successful management of common pool resources. These various theories of commons literature will be used in analysing how local communities use and manage their reef resources. Although commons literature mainly focuses on the assumption that people in their actions make use of rational choices, it is also important to understand people's behaviour towards common pool resources through their held beliefs and particular worldviews. In this sense, I find that it would be useful to review literature on how natural resources are used and managed by traditional and indigenous cultures. In the next section I would focus on the traditionally formed knowledge that shapes the particular worldviews of these cultures.

3.4 Traditional Ecological Knowledge

The importance of knowledge held by local communities has been highlighted through both the value and commons literature. Knowledge, both traditional and scientific are important in management of natural resources for today's communities where the effects of globalisation has expanded the external reach of communities. As the focus of the present research is on small island communities and their interactions with the surrounding reefs, the discussion of knowledge held within the communities is more relevant than globalised scientific knowledge.

Local communities possess invaluable knowledge through generations of interaction with the environment they live in. Such knowledge has been studied under many names such as traditional ecological knowledge (TEK), indigenous knowledge (IK), local knowledge (LK) and folk knowledge (FK). TEK is the most commonly used term in the literature and hence, in the discussions in this section I will use TEK as a general term to talk about knowledge held by specific communities. As it is not intended to give a detailed primer on TEK, I will be limiting the discussion to introducing some main concepts. Through the discussions of the different terminology I will also explain the choice of terminology used for the knowledge held by Maldivian communities. Further engagements with the topic and related theories will be within the discussions of the thesis.

Although TEK as a term came to be widely used in the 1980s it has been documented by anthropologists much earlier (Berkes 2012[1999]). From the earlier focus on documenting the classification of plants and animals by different cultures, the study of TEK shifted to how this knowledge is applied in the local practices and use of the environment. Langdon (2006) discusses the use of traditional knowledge for tidal pulse fishing by Alaskan Tilngit. Fishers in North Carolina base their fishing practices on the TEK they have about the natural cycles, its changes and related changes in fish behaviour (Griffith 2006). Although TEK is often placed in opposition to western scientific knowledge, recent research emphasis has been to see how such TEK can be integrated with western scientific knowledge (Doubleday 1993; Charnley, Fischer and Jones 2007; Mercer, Dominey-Howes, Kelmanand et al. 2007). Berkes et al. (2000) attribute the growing interest in TEK to the recognition that TEK could contribute to conservation of biodiversity.

Despite its wide study by scholars from varying disciplines, one universally accepted definition of TEK does not exist. Berkes (2012[1999], p.7), one of the leading scholars in the area, gives the following definition to encompasses the main concepts of TEK.

> [TEK is] a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.

As stated earlier there are many widely used terms each with its own issues of defining. A more detailed discussion of the various terminology can be found in Butler (2006) and Berkes (2012[1999]). All definitions agree that the knowledge of resources and ecosystems is developed by living in and interacting with the ecosystem over long periods of time. The variances discussed in the literature on the terms and definitions of TEK are based on who holds the knowledge, the spatial locality and how the knowledge is transmitted. Many authors agree that traditional knowledge has to have a cultural rooting and terms such as "cultural continuity", "passed through generations" and "from historical experience" are associated with traditional knowledge (Johnson 1992; Berkes 2012[1999]; Butler 2006).

Indigenous knowledge is also used by some scholars when talking of TEK. IK is used for knowledge held by specific cultural groups and developed locally with little or no outside influence. For example, Butler (2006) use the term IK as her work focuses on a First Nation case study. As Johnson (1992) states similar knowledge may be held by non-indigenous groups interacting with the resources. I find the term local knowledge may be more appropriate to describe knowledge held by both indigenous and non-indigenous groups. This can also incorporate issues where it is hard to determine if the knowledge is traditional in the sense it is passed down through generations. Societies are continuously changing and evolving and thus new ideas will be entering into the already existing traditional knowledge base. These may be by community members or borrowed from other cultures. As Pollnac and Johnson (2005) point out, in today's fast flow of information it would be hard to determine which parts are traditional or indigenous. Scholars on TEK suggest that the term LK is useful for referring to more current knowledge and practices (Berkes 1999; Pollnac and Johnson 2005).

Based on the various definitions and applications of the above terms, I am opting to use the term LK to talk of knowledge held by island communities in the Maldives. The communities have extensive knowledge about the local reef environment they live in, the ecological processes of the system and have developed various use and management institutions based on this knowledge. Some elders in Maldivian communities predict the weather by looking at how the coconut trees bend in the wind and also by looking at the stars. Fishermen can tell when the bait would come and which seasons are for spawning based on the local calendar system called *nakaiy*. The names for the different periods in this calendar are very similar to those used by the Sinhalese indicating origins from another culture. So how can it be determined which kind of knowledge is traditional and local? As Pollnac and Johnson (2005) explain that LK can include both IK and TEK it is a more accurate term to use.

Scholars of TEK identify it as a complex multi-level concept which could be thought of as a knowledge-practice-belief system (Berkes 2012[1999]).This system is based on local and empirical *knowledge* of the environment; the species as well as the natural cycles. The *practice* comes in the way people interact with the environment for their livelihood and general living. These practices are themselves influenced by the *beliefs* held by people in relation to their role in the environment.

These knowledge-practice-belief linkages highlight the fact that "purely ecological aspects of tradition cannot be divorced from the social and the spiritual" (Berkes 2012[1999], p.6). Various scholars have identified different levels in this system. While there are subtle differences, the main components include a system of classification, a set of empirical observations about the local environment and a system of rules governing the use of the environment and its resources (Johnson 1992). Berkes (2012[1999]) gives a four-level model to analyse TEK (Figure 3-6). These include (1) local knowledge of land and animals, (2) land

and resource management systems that include the local practices, (3) social institutions that holds the social rules and codes of practice as well as the political aspects, and (4) the worldview which includes the ethics, morals and general beliefs.

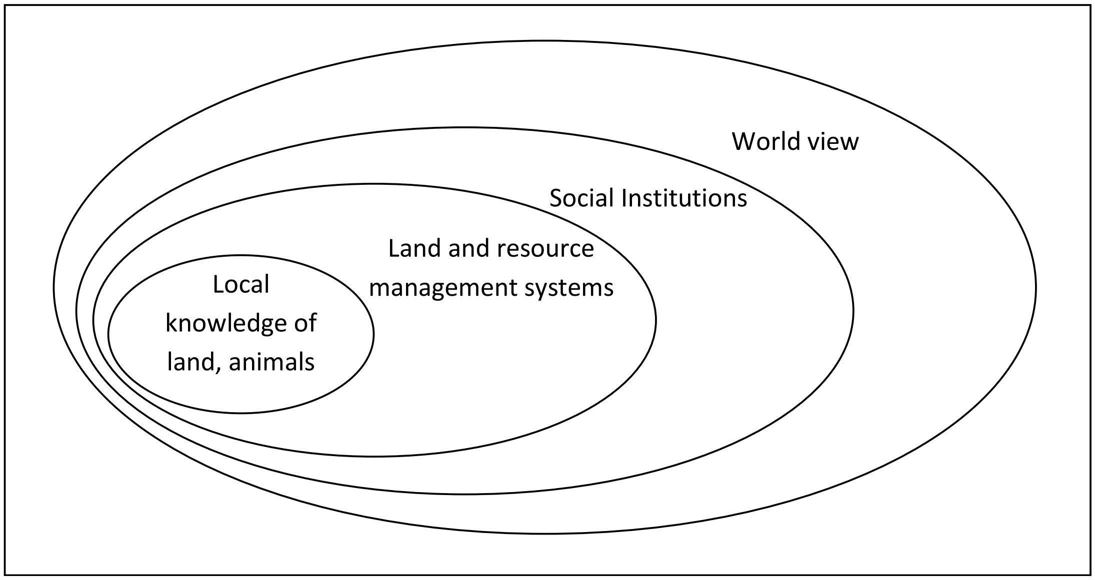


Figure 3-6 Levels of analysis in traditional knowledge and management system (Berkes (2012[1999], p.17)

This model emphasises the importance of worldview or belief systems. As is seen in Figure 3-6, the knowledge, resource management and social institutions are all embedded within this worldview. These concepts of TEK can be quite useful in understanding people's perceptions of nature and how they interact with it. These concepts assume that people are integrated into their natural environment and borrowing Ingold's terminology, are inhabitants rather than exhabitants. The understanding of how communities value their surrounding reefs as well as managing it as a common pool resource, both need to be understood through the particular cultural worldviews of the communities. I have emphasised the importance of this in earlier sections and would like to reinforce the idea again.

3.5 Chapter Conclusion

Theories of value, common pool resources and traditional ecological knowledge have been identified as the main over-arching bodies of literature concerning this research. It is difficult to find a single definition of values and hence, through the thesis a concept of value based on the discussions in this chapter will be used.Therefore, values are used as an enduring concept of worth which is formed through an individual's interaction with the social and physical environments he or she resides in. A main basis for the current research is that our actions are based on the values we hold. Scholars of value-behaviour relationships have theorised that basic values affect our behaviour through general beliefs or assigned values and attitudes. These theories are the underlying assumptions in the understanding of how small communities in the Maldives value their surrounding reefs and their resources.

Reefs and their resources are viewed by communities as a common pool resource and hence, it is important to gain an understanding of the different theories of common pool resources. The concepts of property rights, formal and informal management rules will be used in the analysis of the local management institutions for the use of the reef resources in the communities.

The literature on value and common pool resources alone is not sufficient in understanding the whole social dynamics of the resource use and interaction within the communities. In understanding the value of resources to communities, both people's interaction with the resource and with each other are important. Recent literature on management of natural resources emphasises the need to understand the different human-environment worldviews that guide people's perceptions and interactions with nature. In this respect, I find the local knowledge systems very useful in analysing the ways people in Maldivian communities interact with their surrounding reef resources.

The theories discussed in this chapter have guided this research process and helped in making sense of the information I received from the communities. There were many incidents when I was in the communities that single observations or a discussion with a participant would trigger briefly the literature I had reviewed. Sometimes I would find examples similar to what I had read and sometimes things which made me wonder more. Being in the field to conduct the research was a completely different experience where theory and practice merged. Once out of the field, I set to analyze the information I had gathered and the main findings from this analysis are present in the subsequent chapters. I have presented my findings in two main chapters, the first focusing on the stationary resources sand and coral is discussed in Chapter 4. The mobile resources fish in the lagoons are discussed in Chapter 5.

4. Sand and Coral within the House Reef

4.1. Introduction

Sand and coral are important features in the island ecosystem of the Maldives.[1] In addition to being vital for the existence of the islands, sand and coral remain as the most abundant and close at hand natural resources of the island environment. Hence, since traditional times island communities of the Maldives has found various uses for these resources. For these reasons, I have chosen to explore how sand and coral are valued in the communities. This exploration of values is done through an analysis of how these resources are used and managed in the communities. These exploration of values are discussed in light of theories of value, common pool resources and traditional ecological knowledge.

Sand and coral provide important ecosystem functions to the island communities. While they are the basic constituents of the small and low lying islands of the Maldives, sand and coral are vital for the continued existence of the islands. The extreme low lying nature of the islands means they are very vulnerable to effects of high waves, tides and storms. The house reef of an island protects the islands from high waves by acting as natural breakwaters, which lower the energy of incident waves.

4.2. Interaction with Sand and Coral

The interaction with sand and coral can be separated into two distinct time periods. These are based on the time of traditional use and the change to when these resources were used profoundly for building local houses. These two uses are discussed within this section.

---

[1] In a chronological context, and in the written text, the use of coral superseded that of sand but in my headings and the use of the terms together sand is put before coral. This is because this is the way the two terms are used in the local language, i.e. *veli-gaa*, literally meaning sand-coral

4.2.1 Traditional Uses of Sand and Coral

When people settled in the islands of the Maldives, they chose certain islands over others. According to Jameel (2007), characteristics such as availability of fresh water and the existence of nearby fishing grounds were some of the reasons for choosing particular islands. In addition historic writers tell of people settling in islands where the house reefs were so close and narrow that the islands did not have a large lagoon or natural harbour. The reason for this is believed to be that the difficulty of accessing the islands protected the people from pirates who used to come to the area quite frequently (Maniku 1990). Only those familiar with the surrounding reefs would be able to navigate and access such islands. These choices made by the earliest settlers reflect that they put thought to the various ecosystem functions provided by the reefs and made use of them in a way that suited them. The ways in which the communities made use of the physical characteristics of the house reef changes with the times and what concern is greatest at the time. For the early settlers protection from pirates is given more importance than having easy access for themselves.

In addition to these ecosystem functions, people from the communities regard sand and coral as important natural resources with social and cultural significance. As Stapp, Bennett, Bryan Jr et al. (1969) point out, the existence of any civilization is dependent upon the use of the natural resources in the environment. As humans learn to live and adapt to their surrounding environment it is inevitable that human societies would be going through many changes. This in turn influences how humans use resources from the surrounding environment. The use of sand and coral has gone through similar changes over time and has evolved with the Maldivian communities. From initial customary uses, now sand and coral are primarily being used for construction purposes. Goudie (2006) identify increased human populations and evolution of cultures and technology as important factors contributing to the changes in the natural environment.

4.2.1.1 The Use of Coral

Coral is the only available local building material in the country. Historically live coral from house reefs, dead coral rubble and boulders washed on the beach and beachrock were used by the communities. Within this thesis, I am using "coral" to include live coral, dead coral rubble and boulders as the local communities use the local name *gaa* for all these types of coral. Beachrock is considered under a different name of *aanu*. Slabs cut from the beachrock had been traditionally used for the construction of water wells. Plate 4-1 shows a the area left after a slab had been cut from the beachrock.

Plate 4-1 Exposed beachrock, in Thakandhoo, showing where beachrock has been cut for use

The traditional use of coral was especially reserved for important communal and cultural structures. This is evident in the ruins of Buddhist temples and other religious structures that exist in certain parts of the country. H.C.P. Bell in his 1940 monograph writes that the Buddhist ruins in the island of Gan in Addu Atoll had provided the islanders with a continuous supply, still available during his 1922 visit, of coral slabs for building their mosques and chief houses (Forbes 1983). More recently visible coral structures include mosques, tombstones wells in the mosques and communal bathing tanks called *veyo*. I noticed that these structures in the south were older than those in the northern islands. According to Ibrahim Ahmed Didi, a local historian from the island of Meedhoo some of the coral structures on Meedhoo are 700 to 800 years old.

"Mosques, wells, baths. These things were always made from coral slabs. This was about 700 to 800 years ago. Back then the Koaganu[2] had six mosques, at first. ... The six mosques are made from *hirigaa*. *Hirigaa* and *veligaa*.[3] It [beachrock] is sawed and cut into squares and then brought [to land] and levelled. ... *Hirigaa* is taken from the lagoon and cut to make slabs. Large corals are taken. They take it, cut it and make about ten to twelve slabs. Slabs of two by three feet and one foot, different sized slabs."

އިބްރާހިމް އަޙްމަދު ދީދީ: މިސްކިތާއި، ވަޅު، ފެންޑޯ، އެއްޗެހި ހަދާފައި ހުރީ ފުރިހަމަވީ އަބަދުވެސް
ހިރިގަލުން. އެއީ ގާތްގަޑަކަށް ހަތް ސަތޭކަ، އަށް ސަތޭކަ އަހަރުގެ ކުރިން. އޭރު ކޯގަނޑުގައި ހުރީ
ކޯގަނު ހަ މިސްކިތް ހުންނާނެ ފުރަތަމަ. ... އެ ހަ މިސްކިތަކީ ވެސް ހިރިގަލުން އަޅާފައި ހުރީ
ހަ މިސްކިތް. ހިރިގާއާ ވެލިގާ. ... އެތިރިއްކަން ހަދަ ލިއްސަވައިގެން ގޮސް ކަޓައިގެން
ހަތަރެސްކަނަށް ކަޓައިގެން ގެނެސް ބިމު ހަމަކޮށްލަނީ. ... ހިރިގާ
ނަގަނީ ފަޅުތެރެއިން ނަގައިގެން ކަޓައިގެން ގަނޑުތަކަށް. ... ބޮޑު ސިންގާހިރި
ނަގާނީ. ނަގައިގެން ކަޓައިގެން ގާތްގަޑަކަށް ދިހަ ބާރަ ގަނޑު. ދެ ފޫޓާ ތިން ފޫޓު
ގަޑު އެއް ފޫޓުގެ ގަޑު. އެކިވަރުގެ ގާ.

Plate 4-2. Koaganu Cemetery in Meedhoo (Photo by A. Fairoosh)

---

[2] The Koaganu is a historic site in the island of Meedhoo. It is an ancestral burial ground which is believed to be the oldest cemetery in the Maldives (Plate 4-2).

[3] These terms are used in the local language to avoid confusion over how these coral types are defined in other parts of the Maldives and also in the scientific reef terminology. Ibrahim Ahmed Didi defined the local use of the terms *veligaa* as beachrock and *hirigaa* as coral slabs cuts from the live coral in the house reef.

All structures that were built from coral were those used communally. Traditionally personal dwellings of people did not use coral but was made from thatch made from coconut leaves. It was much later that coral were used in building individual dwellings. This may be due to the intense labour involved in the use of coral. This is evident from Ibrahim Ahmed Didi's account of how coral and beachrock are cut into squares to make the mosques. The importance given to these structures may be the reason that people go to these lengths to make them more durable. Coral along with sand are the most durable material that can be found in the reef environment.

4.2.1.2 The Use of Sand

The use of sand has traditionally been for customary and religious purposes. Travellers to the Maldives have written about the use of sand for traditional festivals such as the *Mauloodh*[4], Eid and Ramadan, the Muslim month of fasting (Gray 1888). In order to prepare for these occasions sand is strewn on the roads and houses. In addition to the religious festivals, sand is also used for decoration in special celebrations such as weddings and circumcisions and also around graves. Many participants relate the white sand on the roads and in houses with cleanliness. The people of Dharavandhoo frequently highlight how the roads in the island look so much cleaner because they had been putting white sand on the roads. The clean, wide roads with the lightly coloured sand was something that immediately caught my eye when I arrived in Dharavandhoo. According to Tuan (1974) colours are among the earliest symbols linked to human emotions and white is often positively associated with light, purity, spirituality, timelessness and the divine. In Islam the colour white also symbolizes purity and holiness . The significant use of white sand in religious practices may be imparting these special meanings.

The use of sand for such customary purposes though has diminished over the years. Strewing of sand in preparation of the fasting month of Ramadan had continued till very recently in many of the islands I visited. The practice had diminished mainly due to the difficulty in getting sand following the government ban on taking sand from the island beach.

---

[4] The *mauloodh* festival is celebrated in the communities as a remembrance of the Prophet Muhammad (PBUH). The festival involves singing prayers and a festive meal called a *keyn*. A *keyn* is a meal of several courses which would usually serve 10-12 people. People from neighbouring islands will be invited for the festival which lasts several days. Some islands reported having similar *mauloodhs* for praying for bounty and a good fishing season.

Now people have to buy sand from miners who collect it from sites identified by the government. Despite the costs involved, in some islands putting sand inside houses is still practiced by some individuals. In Thakandhoo, people strew sand on the side of the road near the house wall instead of the whole road as before. People from Dharavandhoo reported that they used to strew the whole road but stopped only a few years back. Some households continue to strew sand in the courtyards. They find this makes the house appear clean and it is better for the children to play in this white sand. Rahmaan, a man in his late thirties from Dharavandhoo says that "when children get down and play there [in the sand] it is very satisfying".

> ރަޙްމާން: ދެން ކުޑަކުދިން ވެސް އެތަނުގަ މިސާލަކަށް އައިސް އުޅެ ފައިބައިގެން
> އެތަނުގަވެސް، ވަރަށް ހިތްހަމަޖެހުންލިބޭ.

During my visits I found that two of the communities still continue the traditional practice of strewing new white sand on the courtyard of the family home. This is done annually in preparation for Ramadan. I find this case of the two communities quite intriguing that despite the ban on taking sand from the beach people continue to use this sand for customary purposes. I was curious to learn more from the community members on why this practice had continued. It looked to me that this was something that was very important to these communities. As the discussions on this may be sensitive, to maintain anonymity of the communities I would refer to these communities as Community A and Community B in future discussions on this topic.

When I arrived in both communities one thing that struck me was that the courtyards in all the houses were lined with pebble or gravel, which I would call *akiri*. The size of the pebbles varied from house to house and I learnt that this was according to personal taste. Plate 4-3 shows these various sizes of pebbles used in houses. The pebbles had lost their shine and seemed to be just losing their white colour and starting to go grey. It had been some months since Ramadan when I visited. In some of the houses where people did not live anymore the pebbles had turned green from the moss growing there. Many queries about these pebbles went through my mind. Where did they come from? When do the people do this work? How is the community involved in this work? Do neighbours and friends reciprocate help? Most importantly I was curious about the existence of a tradition that has died in most islands.

I started asking Aminath[5], my hostess in Community A, with a simple query of whether everyone in the island put *akiri* in their houses. Aminath's immediate response was no that people did not use *akiri*. This answer confused me and also made me realize there was a lot more into this simple act that I needed to know. Then I explained about what I saw in the houses and Aminath corrected me saying it was *veli*, the general Maldivian word for sand. I was very sure this was not *veli*, at least the part of the country where I come from people would not call this *veli*. We call this *akiri*. I quickly guessed this was a difference in how the people from the capital and in these communities classified sand.

Aminath had spent a good part of her life in the capital and was aware of how people in the capital use these terms. Yet her insistence that the pebbles were *veli* and not *akiri* is an affirmation of how important the local terminology is to the people. Similarly, the people from other communities would be insistent on the different terminology they had grown up with. Perhaps, these differences in terminology reflect the cultural values that each specific community assigns to sand. As I find this distinction in classifying sand important, the way Communities A and B classify sand is compared with other islands I have visited and presented in Table 4-1. These classifications are based on descriptions given by the participants.

When I walked along the beach of Communities A and B it made more sense as to the difference in classification of sand. The deposits of sand I saw on the beaches of these islands are quite different from other islands I had visited in the Maldives. For example, Clark (2001) describes Maldivian beach sand as fine and well sorted. The sand that I saw on these islands could be described ranging from coarse sand to varying sizes of coral rubble (Plate 4-3). The classification in these communities are based on the physical characteristics of their local environment. In Saeed's (2003) work the term "gravel" is used to describe the sand from these islands. In this current work, I would like to keep the terminology consistent with the local usage. Hence, I will continue to use the term "sand" for the gravel/pebbles found on these beaches.

---

[5] To maintain anonymity of the community, I have used a different name to the one given in the participant list in Appendix 3.

Plate 4-3. Sample showing different sizes of sand (gravel) used to decorate houses

Table 4-1. Classification of sand in Maldivian communities

Name used in Communities A and B / in other islands	**Description**
*Dhon veli/Dhon veli**	the fine sand used in masonry and for making cement blocks
Fothi veli/Kashi veli	A coarse flat sand
Veli or sometimes called *kashi veli/ akiri* (small)	Fine gravel/coral rubble used to put in houses
Akiri/ bodu akiri (large)	Large gravel/coral rubble used as aggregates for making concrete

* Masons use further classifications of this *veli* based on use. These are *jahaa veli* (used for plastering), *raanaa veli* (for masonry) and *gaa alhaa veli* (for cement bricks)

This sand used in houses is found only in certain parts of the beach and during specific seasons and is usually covered by coarser gravel (*akiri*). The women of the communities collect the sand and through years of living in the environment they will know when and where to find this sand. The process by which women sift sand deposits, on the beach, into different sizes for strewing in houses is locally known as *veli-hedhun* (literally translated as making sand). Women and young girls will gather at the beach in the early mornings to collect the sand. When they find a good sand deposit they would scoop aside the top layer of *akiri* to reveal the finer sand. This sand is sifted, traditionally with the hand but now some people use a sieve, and sorted according to size. From the piles of different sizes the women would take the size they preferred leaving behind the rest. Walking on the beach I saw many such piles left behind. Each day the women will take home a small amount of sand and pile it in their houses. Day by day the pile of sand at home grows and by Ramadan they would have collected enough for laying the new sand. If there is more sand than needed they might give or sell to someone else who needs more. Saeed (2003, p. 103) describes memories of putting the new sand in preparation for Ramadan.

> The white gravel from the beach is collected months ahead to replace the old gravel in the courtyard and by the doorways, to bring in Ramadan. … I would go to sleep on the eve of Ramadan on clean linen in a scrubbed clean bed, in a sweet smelling home, proud of the white graveled courtyard, an achievement of months' of labor by the women and girl children of the island.

For many the white sand represents cleanliness in contrast with the black soil in the islands. From Saeed's account it is evident that the placing of white sand in the courtyard signifies more than mere aesthetic appeal. It is ceremonial sand symbolizing the coming of Ramadan and the effort put in by the community is to welcome this blessed and joyous month. It is perhaps these meanings of the month of Ramadan that people are associating with by using the white sand. Ramadan is one of the most important months in Islam and is a time when people pay extra attention to the spiritual. There is a whole aura of spirituality in the place during Ramadan.

The members of the community, especially the women talk of making sand with feelings of achievement and pride. The Island Chief of Community B echoes these feelings in the community. "The public believe if they don't put new sand for Ramadan, they don't believe they have done anything [in preparation] for Ramadan. ... It's a special preparation for Ramadan. "

[illegible]
[illegible]
... [illegible]

Just as there were feelings of pride over the accomplishment I was also met with emotions of anger and rebelliousness when discussing the state rules prohibiting taking of sand from the island beach with the women of the islands. Schroeder (1996, p19) talking of the value of natural resources says that "[v]alue and emotion are inseparable" and it is natural for the darker emotions such as anger to rise when highly valued things or places are threatened. These rules of taking sand will be discussed later in this chapter along with detailed discussions of the value placed on the resources by the community.

Communal gathering to collect sand serves for more than just extracting resources. Resource use and extraction cannot be truly isolated from the social aspects of the community. It is a social medium where women share their stories and often a string of social interactions take place. This is also an important place of learning about the land (Saeed 2003). Young children, accompanied by their elders learn about making sand. They learn the times when it is good to collect sand and where the best sand deposits can be found.

Embedded in the learning of this skill is a deeper knowledge, a knowledge of the surrounding environment. A knowledge of the way the sands move, how the tides and currents behave and what changes the seasons bring. This is knowledge the elders have gained by living in the environment and observing it. Saeed (2003) tells of how her mother and her friends, while walking on the beach, talked about the size and types of molluscs on the beach and how certain types had disappeared over the years. In time this knowledge will be passed onto their children, thus ensuring the continuity of the knowledge.

The continuity of such knowledge about the land is threatened as the younger generations continue to live away from the island. People who live away from nature would not have such an intimate understanding and relationship with nature as those who live in proximity with nature (Wildcat 2009). According to Nizar[6], an elder of Community A, many families migrated to the capital in the mid 1970s for jobs in the newly emerged tourism industry and an opportunity for better education for the children.. He says that about half the population of the island now lives on the capital, Male'. The subsequent generations settled in Male' and mostly the elders and a few families continue to live on the island. As I walked on the streets of the community, I could feel this emptiness from the many dilapidated houses falling to ruins and overgrown by bushes. Saeed (2003) acknowledges that by being away from the land she does not have as intimate knowledge of the island environment as her family who resides there.

> Now my eldest cousin tells me that the colour of the rising sun is different to when we were children. I do not have this kind of intimate knowledge of our environment, that I could tell slight differences /changes occurring in the environment or the land (Saeed 2003, p105).

Having grown up in the city I could identify with Saeed. Many times I am quite bewildered at the detailed knowledge that the participants held. Aminath would point to some sand and tell me that is a good spot, but I would think to myself what is the difference of that from just the next point on the beach. She could observe little differences that I could not see. Such local knowledge comes from continuously living in the environment. Berkes (1999) using the term TEK identifies such knowledge as a system of knowledge, practices and beliefs. Making and collecting sand is an example where the local knowledge of the ecological processes of the environment is used. Knowing where sand gets deposited and during which seasons allows the women to manage the use and extraction of this resource. This knowledge and practices are so much an everyday part of their lives that when asked about it the women find it hard to think of it as something special that they know. Responses to my queries on these management practices often include "We just know that sand will be there. Everyone will know". These things are seen as tacit knowledge and application of this knowledge is almost something subconscious and second nature. Centuries of resource use without adverse disturbances gives validation to the sustainable management of "making sand".

---

[6] In order to maintain anonymity of the community, the name used here is different to that given in the participant list in Appendix 3.

As this knowledge is viewed as common knowledge held by everyone there is no hesitation in sharing it among community members. The community members explain that there is always plenty and everyone knows where the sand is. I was able to observe one such transmission when I went with Aminath to experience how they make sand. On our way we met others already coming from the beach. Aminath asked how the sand was and they replied that there was not any good sand deposits that day. This openness and sharing of information instantly caught my interest and I asked Aminath if it was common to share such information. Aminath explained that asking and sharing is a social habit more like a form of greeting. Saeed (2003, p103) also tells of meeting women coming back from making sand and how they would "tell of locations on the beach where there was good gravel that day." Being for customary use only there is no incentive for people to take more than is needed and there is no competition for use either. It is a belief by the whole community that everyone has to perform this act to welcome Ramadan.

Although the traditional use of sand had continued in Communities A and B, in all other islands these customs are practiced by only a few individuals. Similarly the traditional use of coral is no longer continued in the communities. The construction of more durable dwellings made of coral marked the beginning of the construction era and the commercial use of sand and coral.

4.2.2. Sand and Coral as a Commodity

The construction of local dwellings using coral started more recently. Earlier housing was made from coconut thatch and locally available timber. The move towards construction of more durable houses was due to the improved standards of living. In the early 1970s the introduction of mechanized fishing vessels allowed fishing to be done at a larger scale than before. With this improvement in fishing more money was being generated in the communities and the building of coral houses became a growing trend (Naseer 1997). This is confirmed in discussions with people from the northern atolls and Baa atoll. According to participants from Hulhudhoo and Meedhoo the construction of coral houses in the south had started much earlier about 150 years ago. This can be seen from some of the older houses that still remain today.

Before the prohibition of mining coral from house reefs, coral for building had always been taken from the house reef or the shore. Apart from the communities of Hulhudhoo and Meedhoo, all other communities mined live coral from within their house reef. In Hulhudhoo and Meedhoo large amounts of dead coral boulders can be found washed on the shore. People from these communities said that as this was available on the shore there was no need to spend effort on mining live coral. Participants explained that rather than going to other reefs or islands, getting coral from the closest places, whether from the beach or the house reef, was the sensible thing to do. Going to further places would require more work and also the use of larger boats. Such commonsensical approaches to using man's surrounding environment is not new. Since the time of hunter-gatherers humans have been organizing themselves to use resources from their environment in the most efficient manner possible (Goudie 2006).

Many of the people I spoke with still remembered the times when coral was taken from within the house reefs. The large size of corals mined was always spoken of with amazement in their voices. a woman from Dharavandhoo, tells of how the sixteen by twelve foot kitchen in her grandmother's house was built from a single massive coral. Similarly, Fazna, a woman in her late forties from Dharavandhoo, says that the outer bathhouse in her house was built from a single porite coral. They relate these stories with wonder at nature saying that one would not believe such tales now but that they have seen and touched these massive corals. The amount of coral taken is another amazing story related by many. "So much! So much!" was a common phrase in the discussions on mining coral from the house reefs. Such remarks are directed towards the inexhaustible supply of coral in the surrounding environment. It is a common view among communities that the resources from the sea is a provision from Allah and cannot be exhausted. Similar views that marine resources are vast and limitless is often held by coastal communities (Pollnac and Johnson 2005). Nevertheless, many communities believed that mining coral from the house reef made the islands more susceptible to large waves and storms.

On taking the coral from the house reef, it is broken into pieces to be used as building blocks. Lime, made from burning coral rubble or *akiri*, was used as a binding agent for building houses. Rahma, from Dharavandhoo who is in her late twenties, said she remembers people making lime on the island when she was little. Describing the making of coral lime, Shaheedha, a woman in her early forties from Dharavandhoo, said that a large pit is first dug and this is filled with dry coconut leaves and firewood. The coral pieces are put on top and holes are made on the sides to put flames in. When the pit is full the flames are lit. The fire continues to burn, for up to a week and a half, and the heat makes the coral into a powder which is used as lime. While describing the making of lime Shaheedha and her friends said that one should be able to imagine the work and time involved in building a coral house at the time. This perhaps is a reason for the few and smaller sized houses built at the time. Shaheedha says that "then there are only few houses built of coral, isn't it! If houses were built like that now there wouldn't be a single coral left."

ޝަހީދާ: އޭރުގާގަނޑު ތޯ ގެކާނާކަ ހުރިހެއް. މިހާރު މިގޮތަށް ގެކާނާކަރުހިނަމަ ނޯހީސް ތޯ އެއްވެ
ގާ ކޮޅެއްވެސް.

As stated by Shaheedha the scale of construction today is very different to when coral houses were first built. The increase in population and improvements in living standards has meant that houses have become larger and more numerous. An important factor contributing to the increase in construction of large housing is the availability of cement which is cheaper and easier to obtain than coral. This meant that such laborious and time consuming tasks as mining coral and making lime were not required. Instead of coral, cement bricks made from sand and cement were used. Plate 4-4 shows extension work done on an older coral house using cement bricks.

On discussing the impact of coral mining on the island, many of the participants agreed with Shaheedha's view that when coral houses were first constructed the scale was too small to cause much impact on the house reef and the island. Expressions like, "back then we did not build such large houses" or “there weren’t so many people then” are all explanations for why it was natural to use the coral from the house reef. It is indeed only natural for human communities to make use of resources from their surrounding environment. Such relations with the surrounding environment are seen as everyday living for those dwelling in the environment. Without any visible adverse effects on the island system there was no reason to be concerned over removing coral from the house reef, especially when the level of use was low.

Plate 4-4. Outer wall of house in Dharavandhoo. Cement bricks have been laid over the older coral wall.

The interaction of humans and their environment has always been a learning experience through actions, outcomes and reactions. As Johannes (2002a) points out, communities that practice natural resource conservation at some stage in their history had learned that without such practices their resources would get depleted. For example, the many traditions of *tapu*, used by Maori, in the use of the natural resources stems from experiential learning of the impacts of their initial use of the environment (Harada and Glasby 2000; Ginn 2008; Bess 2010).

According to Scheffer, Westley, Brock et al. (2002) communities adjust their behaviour affecting ecosystems in response to perceived changes in these systems. It would be only after the effects of mining coral become apparent that the communities would realize and act to control their actions. The community of Kendhoo demonstrates this by their initiative in banning the mining of coral from the house reef even before state rules came into effect. According to the community members this was done as they noticed severe permanent erosion occurring in the island after they started taking coral from the house reef. The community instead chose to go to nearby reefs to collect the coral needed to build their houses. This would mean a little extra cost for sea transport and more cost in terms of time spent to get the coral. This shows that the safety of the island, provided by the house reef, is of foremost importance to the community. The logical reasoning for this behaviour is that there is coral elsewhere to use for building houses but the protective function of the corals in the house reef, once gone, would prove perilous for the island.

In response to severe erosion, many of the communities had built artificial breakwaters, made from coral, to protect the islands. All the islands I visited had such breakwaters indicating attempts to combat erosion. The coral for the breakwaters are obtained from nearby reefs. People from Dharavandhoo explained that they took coral from the house reef on the side which was not eroding but later they realized this caused more erosion. The labour involved in collecting the coral and building the breakwater is a community effort. All communities describe these events with much excitement and they view these as a festivity full of community spirit. Men and women working to bring the coral, putting up the breakwaters and women engaged in making meals for the workers are all contributing to a common goal of improving things in their island. These events help create cooperation and social bonds within the communities. Many elders express sadness that with such work being given away on contract basis, the community spirit has dwindled. Working for the betterment of the community has been replaced with monetary payment. As quoted below, Qadir an elderly fisherman from Dharavandhoo hints at the "awareness" in the communities as an additional reason for the people not working together. This awareness had been discussed by many participants as a growing trend among youngsters for any rule, regulation or order coming from the island office to be formalised by legitimacy to be accepted

> "Now such things cannot be done. Now such things are given on estimate basis. Everything. ... Now the people also will not work like they used to. Wouldn't come. Now how things are has become more clear for the people. Earlier very much earlier [the island officials] would blow a conch to gather people. After blowing the conch and bringing the people [they] would say you have to make lime. Then we made lime. Now there isn't anyone who would obey the officials. I am saying the reality of things, how they are."

> ޤާދިރު: މިހާރު އެކަހަލަ ކަންތަކެއް ނުކުރެވޭނެއެއްނު. މިހާރު އެކަހަލަ ކަންތަކެއް އޮންނަނީ ރައްޔިތުންނަށްވެސް އެސްޓިމޭޓަށް ދީފަ. ކޮންމެ ކަމެއްވެސް. ... މިހާރު ކުރީގަ ކުރާހެންނެއް ނުވެސް ކުރާނެ. ނުވެސް ނުކުންނާނެ. އެއީ މިހާރު މީސްމީހުންނަށް ކަންތައް އޮންނަގޮތް މާބޮޑަށް ސާފުކޮށް އެގިއްޖެ. ... ކުރީޒަމާނުގަ އެންމެ ކުރީޒަމާނުގަ ފުންމާން ސަންގެއް ރައްޔިތުން އެއްކުރުމަށް. ސަންގުފުންމާފައި ރައްޔިތުން ނެރެފާލާ ބުނާނީ ކަލޭމެން [illegible] އުފައްދަންވީ އޭ.

އެވީ އުވަދަވަން. މިހާރު ވެރިން އަންގައިގެން އެކަމަކު ކިޔަމަންނާވ މީހަކު ނުހުންނާނެ.
ރަށީގަނޑުވެސް އޮންނަގޮތަށް އަރަގެން މިދުބުނީ.

Ongoing erosion problems led to the government banning the mining of coral from the house reefs. This meant that now like the people of Kendhoo everyone had to get coral from nearby reefs by using boats. This also created a livelihood opportunity for those who owned boats. As mentioned earlier the availability of cement for building led to coral being replaced with cement bricks. This was the phase when sand from island beaches started to be used for construction. Sand along with cement were used as primary ingredients for making cement bricks. Initially, sand from island beaches were taken but this was banned by the government due to reports of severe erosion from many of the island communities. This forced people to put more cost, time and labour into obtaining sand. When sand was allowed to be taken from the beach people helped each other with the labour required for bringing sand to the houses. This labour is reciprocated within the community. Now people had to travel, by boat, to sandbanks in the atoll waters to collect sand. For most the option for paying at a fixed rate to the boat owner for fuel and labour was more convenient than putting in the time and labour themselves. Therefore, as with coral, boat owners had a livelihood opportunity by mining sand.

Various social norms, local and state rules guide the use of sand and coral in the communities. These management systems can help us infer what aspects of the resources are particularly important to the communities and why. As can be seen in the Kendhoo example the choice of getting coral from further reefs relate the importance of the protection provided by the house reef. In the next sections, I will be exploring these local management institutions for the use of sand and coral.

4.3. *Management Institutions for Use of Sand and Coral*

For small islands surrounded by reefs, sand and coral are among the few natural resources available in these communities. The use of these resources along with the many ways of managing them have changed over time. Like most resources in the surrounding environment, the management institutions in place for the use of sand and coral include both the formal rules which are legally acknowledged at local or state level and the informal ones which are unwritten rules and rights that have been formed by local acceptance. Within this discussion of management institutions, the terms "state rules", "local rules" and "norms" as defined in Chapter 1 will be used.

4.3.1 Norms and Local Rules

In all communities participants relate that as far back as they can remember there were no local rules for extracting and using sand or coral. Ibrahim Waheed, the Bodu Katheeb of Maarandhoo explained that this may be because traditionally people did not use sand and coral that much and so there was no need for many rules. As explained in earlier in this chapter, most of the traditional use of sand and coral were for customary or communal purposes. Individual houses were made of thatch and there was no need for taking large amounts of sand and coral like now for building houses. Even when people started using coral for dwellings, there were very few houses built and they were very small in size. Therefore, the amount of coral taken was not significant compared to the abundant resources. This may be a reason for the initial lack of local rules for use. Many participants related that everyone just went and got the resources from the beach and house reef when the need arose. Manik, a man in his late 40s explained that "how [they] can do, how [they] are able to do, how [they] want to do. [they] are allowed to do."

މަނިކް: ކުރާގޮތަކަށް ކުރެވޭގޮތަކަށް ބޭނުންވާގޮތަކަށް ކުރަން އޮންނަނީ.

There were no restrictions on where to take coral from, when to take it and how much. This is an example of how local rules are deemed unnecessary when the resource use is low compared to the relative abundance of resources. Population statistics show that in the early 1960s the population of the Maldives was less than one third of the current population (Ministry of Planning and National Development 2008). Therefore, the size of the island communities was low at the time reflecting very little resource use compared to now. According to Baland and Platteau (1996) communities living close to abundant resources with little competition over use have few use and access rules.

The lack of rules may also be reflective of the small size and homogeneous nature of the communities. The people in the island communities share a common culture, religion, language and social norms. In addition to such demographic homogeneity, the way of life in the islands leads people to have similar resource needs and uses. For example, as the whole community is Muslim, customary use of sand for strewing on the houses and roads for Ramadan is a common tradition for all families on the island. The efficient self-governance of resources by small and homogeneous communities is also identified in literature (Baland and Platteau 1996; Ostrom 1999; Aswani and Hamilton 2004). According to Ostrom (2006) if the resource use interests within a community differ, then effective self-governance and management may prove challenging. Baland and Platteau (1996) identify both heterogeneity in cultural or ethical divisions and heterogeneity of interests within a community as strong barriers to form a collective action.

Pagdee, Kim and Daugherty (2006) in their meta analysis identify the equitable distribution of resource benefit among community members as important in managing a resource. The fact that most traditional uses of sand and coral in the communities are related to the traditions and culture of the communities mean that these uses are compulsory for all members, whether they be the leaders, the elite or the commoner. Thus there is no concern over unequal distribution of benefits. Each member would take sand or coral only to the extent it is needed. For example, coral for carving a tombstone or sand for strewing in their houses. These issues are also linked with fairness in allocation of resources among the community discussed by Baland and Platteau (1996).

Based on the above it is fairly evident that local rules for the use of sand and coral were not needed in these small communities. Many norms existed within the communities for using sand and coral. These include practices and behaviour based on understanding and acceptance by the whole community. Although people can go to the beach or house reef and extract sand or coral without restrictions it is always taken when needed and not in excess. This may arise from the simple lifestyle of the islands at the time. Many of the elders I spoke to described earlier days as simple and practical with people having little materialistic wants and needs. Ibrahim Ahmed Didi described the simple foods, dwellings, and the few clothes people had. To give the extent of the simplicity in terms I could comprehend he said people did not even drink tea then. They only drank water. The religious views of the community calling for simplicity and not being wasteful may be seen as influencing this behaviour.

Discussions with community members also brought out more logic-based reasons for this. For example, extracting sand and coral requires very intensive manual labour. In addition to the task of extracting the resource, the transportation itself requires manual carrying of coral and sand bags from the shore or reef to the place of use. Although the distance in these small islands would be relatively small, according to the spatial perspectives of the locals the distance would be great especially with a heavy load. This would definitely limit the amount of resource extracted and also force people to take only the required amount. Today modern tools and vehicles are available for resource extraction. Fazna remembers, as a child, seeing her father extract coral for making tombstones.

> "Coral are brought from very far isn't it [to others in the group]. They will take and about two, three people will bring it in using rope. They will bring into water deep enough to stand and they will cut the coral in half. Then they will bring it to still shallower water and saw it [to smaller pieces] as much as they can. When they have the right size to put to the stone grinder then they will roll it and bring it ashore. You have to pour water when cutting otherwise you can't cut it."

> ފަޒްނާ: ހިރި އާ ވަރަށް ދުރުން ދޯ ނަގައިގެން ދެން އެއްކަލަ ދެތީރަކު މިސް ވީރަކުވެގެން
> ވާޖަހައިގެން ގެންނާނީ. ދީ އިސްކޮޅާހިސާބަށް ގެނެސްގެން ދެން އެތާ ތިބެގެން ކޮޅި ހަމަ
> މެދުން ފަޅާލާނީ. ދެން ގެނެއްސަ ދެން އައަރުވެރިއް ތިލަހިސާބުގަ ތިބެގެން ކިހާވަރަކަށް
> އަށެއްކާ ކަހާނީ. ކަހައިގެން ދެން އެ ހަމަ ހަރުގާ ހަރުވަރަށް ވިހަނދުވަ ދެން ފުރޮޅުވުން
> އެއްގަމަށް އަރުވާ ނަގައިގެން. އެކަހާއިރުގަ ޖެހޭނެ ފެން އަޅަން. އެހެންނޫނީ ނުކެހޭނެ.

The labour required is often not considered to be a cost in the small communities. They see this as something reciprocated or exchanged for other goods or services among family and friends. Fazna explained that even the poor person can build a house as there was no need to buy coral. They only have to do the work, with help reciprocated among community members, to get the coral. This lack of market demands and incentives for profits further limited the extraction of the resources. Hameed. the Island Counsellor from Makunudhoo, narrates how in the community everyone helps one another when someone wants to build a house.

> "In this island when a person wants to build his house he will not go alone and get the coral. Anyone in the island [will go] when asked. I will go when asked. Ask anyone. Like that everyone from the island will go to get coral."

> ހަމީދު: މިރަށުގަ ގާނަގަނީ އެމީހަކު ގޭހަދަންވީމަ އެމީހަކު އަމިއްލައަށް ގޮސްގެނެއްނޫން. ހަމަ
> ރަށުގެ ކޮންމެމީހެއްކަޔިފި ބުނެފިއްސ. އަހުރެ ކައިފި ބުނެފިއްސ. ކޮންމެމީހެއް ކައިފި
> ބުނެފިއްސ. އެގޮތަށް ރަށުގެ ހުރިހާ މީހުންވެސް ދާނެ ގާނަގަން.

This is a community spirit and relationship described by all communities I visited. Such exchange of services are typical of generalised reciprocity systems described by Sahlins (1972) and are based on strong personal relations, like those among close family. Island communities in the Maldives can be said to be a big family unit as members are almost always related to one another through kinship or marriage. In such communities people never regarded their exchanges as *quid pro quo*, these were just acts to be reciprocated when and if the other was in need. Through these exchanges goods and services get distributed and circulated in these informal gift economies. These spheres of exchange continue to operate even today, but to a lesser degree than before. The inevitable impact of modernization and market economy had hit the communities as strongly expressed by many elders. The boats which were previously given for free had to be given with a charge, the cost of fuel, when the boats became mechanized.

Another factor that contributes to the small scale use of resources on an island is that the resources within the house reef are only used by the communities which reside there. It is a commonly understood and accepted norm by all communities that outsiders cannot use the resources within their island house reef. Many people say that this is not a rule but people just do not go there, thus showing the emphasis on this being viewed as a norm in the community. Rasheed, from Dharavandhoo reasons that this understanding was based on doing what is most convenient and efficient. It did not make sense for people to go somewhere far off to get coral and sand when these resources were right in their own island. Each island would have enough sand and coral within their house reef for use by the people of that island. This perhaps is because sand and coral are stationary resources. A stationary and easy to store resource would be easier to manage than their counterparts (Moran 2006). For example, some of the communities have reported disputes among nearby islands over mobile schools of dense scads that enter the island lagoon. This is discussed in more detail in Chapter 5.

These views and statements saying that people simply do not go and use resources from another island is recognition of the island and its resources as being a common property belonging to the people who occupy the island. The communities consider the lagoon surrounding the island and bounded by the house reef as a seaward extension of the island. Therefore, outsiders would not have a right to use the resources within the house reef of an island. According to Karl Marx, the distinction of land as property is always mediated through occupancy of the land by a tribe and the acceptance and realization by others on the rights of the tribe to that land (Bologh 1979). In this regard, the rights of a community to use and regulate the resources within the house reef of their island is accepted by all other communities.

Presently, two property rights regimes exist with regards to resources within the house reef of an island, local and state level. Traditional ownership and governance of individual islands was exercised by the local communities prior to the first written constitution being instituted (Saeed 2005). Hence, at the local level rules of use and regulation of reef resources within the house reef was controlled by the communities. Ibrahim Ahmed Didi of Meedhoo mentioned that before the island became state owned, the island and its resources had belonged to the families who cleared the land for habitation. The state did not intervene in the local governance and the families of the island gave a predefined share of the produce to the island chiefs to conduct communal duties such as leading prayers and burying the dead (Saeed 2003).

Despite the change in legal ownership status, the unwritten laws and traditions continued to be used with regards to most resources. Local communities still continued with the operational level rights to use and regulate resources such as sand, coral and fish that come into the island lagoon. Most importantly, the community exercised the right to exclude outsiders from the use of resources within the house reef. This is thanks to the effect of being seen as an informal territorial system. Cashdan (1983, p.47) following Carpenter and MacMillan (1979) define territoriality as "the maintenance of an area 'within which the resident controls or restricts use of one or more environmental resources.'" Although this territorial exclusion is not seen much over the use of sand and coral, it is clearly seen by the cohesive way in which community members act to exclude outsiders from accessing scads that enter their island lagoon.

Although legally ownership of land and the lagoon of an island belonged to the state, there was little assertion of this property right with regards to reef resources. This can be seen by the few rules for use and management of sand and coral when these uses were predominantly traditional. State interference and regulation of the use of sand and coral only came due to the islands facing problems of erosion. The state controlled the access and withdrawal rights as well as rights to regulate. The island officials play more of a role in enforcing and monitoring the state rules. It is inevitable in all property rights regimes that some rights may be shared by different groups and in other cases different groups may exercise different levels of control over a resource (Starrett 2003). In the local communities, this level of control varied across the type of resources too. For example, as discussed in Chapter 5, in the case of fish in the island lagoon the rights to use and regulate were predominantly controlled by the community.

Increases in population and improved standards of living meant more demand on the resources. Slowly some local rules were starting to form in the extraction of sand and coral. Some of the measures reported include assigning and rotating sites on the beach and more monitoring by the island office of the amounts taken. Sometimes if the island needed a boat access channel the island officials will ask people to take from the area where they need this channel. Mahmoodha, a woman in her mid forties from Dharavandhoo describe some of the changes in local rules that had taken place on taking sand.

> "[Initially] people could just take [sand] from the beach. From this side [indicating to the beach] and even from [the beach] near your house. Even when the seawall [at the harbour] was not built. after the seawall was built also. After the seawall was built we were told to take sand from the end of the Dhigu Magu [the main street]. After taking from there then we were asked to take from another area. After that we have to go to the [Island] office when we need to take sand. Someone from the office will go with us and show where to take sand and how much to take. It was like that and later it was fully banned."

> މަހްމޫދާ: ގޮނޑު ދޮށުން ހަމަ ބޭނުންވިހާ ނަގަނީ، ދެން މިދިމާލުންވެސް ހަމަ ގެއާ
> ދިމާލުންވެސް ވެލިނަގަން. އޭރު ފާޅަރު ނުލާއިރުވެސް. ފާޅަރު ލުމަށްފަހުވެސް ނަގޭ. ފާޅަރު
> ލުމަށްފަހު ދެން އޮތީ އަންގާފަ މިހަރު ދިގުމަގު ކޮޅުން ނަގަން. އެކޮޅުން ނަގަމުން ދެން
> އަންގައިދީ ދެން އަނެއްކާ އެހެން ދިމާލަކުން ނަގަން. ދެން އޮފީހަށް ދާންޖެހެން
> ވެލިނަގަންވީމަ. ދިޔައިމާ އޮފީހުން މީހަކުވެސް ދައްކާން ނަގަންވާ ތަން ނަގަންވާ އަދަދު.
> ދެން އެހެން އޮވެފަ ދެން އަނެއްކާ މި މުޅިން ހުއްޓުވީ.

These measures, according to some islands and participants, came after government rules banned mining of coral. The accounts I got from different communities, government officials, the general public as well as written documentation I have found regarding the local rules and state rules did not match chronologically as to when each rule was formed. For example, I found a written state rule formed in 1978 which declared that before any coral or sand, except coral rubble for making lime, is taken from islands permission has to be obtained from a body appointed by the Ministry of Atolls Administration. The existence or awareness of such a state rule was not mentioned by either the officials or the public from any of the communities. This is not surprising as poor dissemination of such information by the government has been identified as an issue in resource management in the Maldives (United Nations Development Programme 2004). For example, consultation with community members in Baa Atoll showed that many were not aware of the Marine Protected Area in the atoll which was established in 1999 (Mohamed 2007). The main problem identified by Mohamed (2007) in the dissemination was that after the initial informing of rules and regulation there is no follow-up on them and these remain as filed pieces of paper.

I presume the 1978 state rule has been lost in transit from paper to implementation. In addition, with the informal nature of implementation of rules it is easy for people to forget about these rules or confuse them with local rules. For example, the ban on using nets to catch fish in the island lagoon has been reported by people as both a state rule and a local rule. I find it is the rules that are more easily accepted and implemented by the community that are more contested in this way. According to Fahmee, an Assistant Prosecutor General at the Maldives Attorney General's Office, the earlier state rules on resource use are often based on norms and local rules practiced in the communities.[7] Contestation may arise if rules have been formed independently and simultaneously. For example, the increased demand for sand may have been identified as an issue by the community and they had been discussing about how to manage this better. If a state rule were to come at such a time then a contestation might occur. This hypothesising on my part to explain the difference reported by the communities both in terms of chronological order of rules and what were local and state rules are not random thoughts; they are based on my observation of the community, discussions with them on how local rules are formed, judgements of validity of reported information from different sources and also my own experience in environmental management in the government.

Setting aside the issue of whether the local or state rules came first I would like to focus on the local rules identified by the communities. Although in some communities local rules of taking sand and coral had existed earlier, too many of the later rules were in response

---

[7] Fahmee has also worked as an Atoll Chief in Gaaf Alif Atoll in 1976 and has over forty years of legal experience in the Maldives.

to the community noticing more permanent erosion of the islands. From discussion with different participants I gather these were just before the state rules of 1992. All the communities, in hindsight, acknowledge that mining corals from the house reef had contributed to erosion of the islands. The people of Thakandhoo say the island is now more exposed to strong waves on the side where a lot of coral was taken and that side had eroded a lot.

Sand mining as a cause of this erosion is still largely debated among community members. This is based on their years of experience and observation of the environment they live in. There are people who say they have seen sandbanks which have continued to be there, throughout their lifetime, despite the large amounts of sand taken. At the same time there are others who describe having seen islands disappear when sand was taken. However, there is local consensus that destroying the house reef caused erosion of the islands. According to Readshaw (1994) as cited in Shaig (2006), causes of erosion in the Maldives include among others, increased exposure to incident waves due to historical mining of house reef and changes in the natural sediment balance. The loss of protection from the house reef may have exposed the beach sand to be permanently taken away by large waves. Seasonal erosion where sand spits move to different sides of the island is common in all the islands of the Maldives. The concern is for permanent erosion when the beach completely disappears.

Evidence of concern by communities for erosion can be inferred from the effort spent by communities in building artificial breakwaters. As mentioned earlier, the community of Kendhoo is an example of community initiative in addressing this issue. People from the community noticed that taking the corals caused erosion of the island and that stronger waves came in. The people discussed the issue and brought it to the attention of the island office. This was followed by consultation among island officials and members of the Island Development Committee and a ban on taking coral from the house reef was implemented.[8] Mohamed Saeed, the Island Chief of Kendhoo describe the initiative taken by the community.

---

[8] Survey of quantities of sand and coral mined in Baa Atoll done by Clark (2001) report no records of coral mined in Kendhoo as mining had stopped on the island six years earlier.

> “At that time, everyone believed that taking coral from the reefs was a harmful thing. Because everyone believed so we put a self ban. That became a public rule imposed by the island office.”

> މުޙައްމަދު ސަޢީދު: ދެން އޭރު [illegible] [illegible] [illegible] ފަރުން ގާނެގުމަކީ ގެއްލުން
> ހުރިކަމެއްކަމަށް. [illegible] [illegible] [illegible] [illegible] [illegible] ދެން [illegible]
> [illegible] [illegible] ހަމަ އާންމު ޤަވާއިދަކަށް [illegible]

A similar example can be seen in the island of Hulhudhoo. As described by the Ali Anwar, the Katheeb of Hulhudhoo, since the 1970s, the community had put in place local rules on taking of sand from the beach.

> “Approximately in 1970, by then beach erosion was beyond hope. At the time there was no government regulations. But the people of Hulhudhoo initiated and through the island office and island [development] committee made it a prohibited thing. From that day [we] managed it in this way. We, the island office from that day - since 1970- had identified a place [to take sand]. As such [sand] was taken from a designated area in the south western side of the island.”

> ޢަލީ އަންވަރު: 1970 ވަނައަހަރު ގާތްގަޑަކަށް އެހާ [illegible] [illegible] [illegible]
> [illegible] [illegible] ދެން އޭރު ސަރުކާރުން އަދި ވަކި ޤަވާއިދެއް ހެދިފައެއްނުވޭ.
> އެހެންނަމަވެސް ހުޅުދޫ ރައްޔިތުން އަމިއްލައަށް ރަށުއޮފީހާ ދެމެދުވެރިވެގެން [illegible]
> [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
> [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
> [illegible] 1970ން [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
> [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

In both cases the officials reported that compliance by the community was good. Many scholars on management of common pool resources agree that cooperation is better achieved when rules are developed locally among the user groups (Baland and Platteau 1996; Agrawal 2001). Baland and Platteau (1996) further add that the rules should be kept as simple as possible and should be perceived as fair by all members of the community. Many of the community members had pointed out that these bans posed equal disadvantages for everyone as they now had to go further to get the resource. Everyone helps each other when collecting these resources. In a community with such strong social capital, inequalities in capability are irrelevant. Development of such local rules also is an example where the community places a higher value on the protection provided to the island by the resource.

Local knowledge of the island and reef environment plays a significant role in the development of these local rules. For example, the linkages of the seasonal changes, the movements of the currents and tides and the movement of the sand spits are things the local community have observed for a long time and knows well. Such knowledge would be possessed by everyone living in the environment. The women who go and make sand possess this knowledge as well as the island chiefs or other elders. Through experience they all know. I was so surprised by the detailed description that Faheem, a man in his late forties from Meedhoo, who has been involved in mining sand and coral for over 30 years, gave about the formation and accretion of sand on the beach. As he described the movement of coral fragments using terms like rolling, doing somersaults I could visualise lessons I had learnt on how sediment gets transported in the ocean (Hearn 2008). What he was describing from his observations in the environment was so consistent with what I had learnt from books and lectures. I was very much amazed by the many such stories from people.

4.3.2 The Role of the State

In contrast to other resources inside the house reef there exist more state rules for the use of sand and coral. There are almost no state rules governing the catching and use of fish that come inside the house reefs. This may be because unlike fish, sand and coral are stationary resources which remain in the house reef environment and provide valuable protection for the islands.

The earliest records of state rules on the use of sand and coral from inhabited islands were in the form of a government law formed in 1978. According to the law people had to obtain permission from a state body appointed by the Ministry of Atolls Administration before sand and coral could be taken. Coral rubble for making lime were exempt from this law. The formation of this law corresponds with the initial emergence of coral housing reported by the communities. Therefore, this law may have been in response to the rapid demand for sand and coral by the community.

Ostrom (1999), on self-governance of forest resources, expresses the likelihood of the resources being degraded or destroyed unless an appropriate form of regulating by users or an external authority exists. The success of different types of governance regimes has been much debated in literature (Baland and Platteau 1996; Agrawal 2002). While some believed state and markets to be the better management institutions, others were of the view that a common property regime would be more suited. Field evidence has shown that conventional theory cannot predict whether one management regime is superior to the other (Ostrom 1999; Berkes 2005). All these management regimes have had their share of successes and failures (Acheson 2006). The correct combination of factors in a given situation make a regime successful, while it may not be appropriate for another situation.

Scholars of common pool resources agree that when there is high resource demand for livelihood or other similar variables user groups organise themselves to avoid losses to the community associated with an open access situation (Wade 1994[1988]; Baland and Platteau 1996; Ostrom 1999; Agrawal 2001). Sand and coral in the Maldive communities hold many other design factors which authors have identified as needed for successful governance of common pool resources.[9] These include small size of resource, having well defined resource boundaries, low resource mobility and a small user group living in close proximity with the resource. Compared with the previous customary uses of sand and coral this sudden change in use for housing would have elders foreseeing large amounts of coral being extracted from the islands and issues of resource use arising among users. The 1978 state rule may have been in anticipation of such issues arising in the future. Hence, this overarching law gives each user group autonomy and flexibility to manage and monitor their resources.

The rules claimed by community members as being locally developed hold more weight under this directive which gives autonomy of rule-making to the communities. Many scholars agree that management institutions are more successful when the rule of access and management are developed locally (Agrawal 2001). "Co-operation is enhanced when small groups live close to well-delineated [common pool resources] CPRs and when they are able to lay down access and management rules in their own way" (Baland and Platteau 1996, p.344).

---

[9] A detailed list of these factors are given in the literature review in Chapter 3.

Despite the evidence that small user groups can effectively manage the resources some findings support that state intervention may be necessary in some cases. Baland and Platteau (1996) identify that some state intervention is needed if (i) the actors do not fully understand the ecological processes, or (ii) they cannot protect the resource from intruders, or (iii) the poverty of actors drives them to overexploit the resources.

The issue of understanding of ecological processes, identified in (i), is a complicated and contested one. The major concerns are over the level of understanding of the ecological processes and the validity of the knowledge. The understanding of ecological processes both in terms of traditional ecological knowledge and western science has often been compared and discussed in literature (Johnson 1992; Berkes 1999; Barnhardt and Kawagley 2005). Poverty as a cause of resource over-exploitation or environmental degradation has also been much contested in literature (Guha and Martinez-Alier 1997; Duraiappah 1998; Ravnborg 2003,). While some studies have shown a link between poverty and environmental degradation scholars argue that this cannot be seen as a direct cause without exploring other causal relationships. They believe poverty to be vested in a more complex set of variables, such as demographics, culture and institutions, that are important in the poverty-degradation nexus. Agrawal (2002) on the basis that all people, and rich people especially, depend on and exploit natural resources recasts the poverty condition in terms of low opportunity cost of degrading the environment.

The role of the 1978 state rule is more facilitative and could be termed almost as absent based on the role it played in governing the extraction of sand and coral. As mentioned earlier none of the communities I visited remembered or mentioned the existence of this rule. The level of state involvement was further increased with the Preliminary Sand and Coral Mining Regulations introduced in 1992.[10] In examining this increased state role in light of the conditions identified by Baland and Platteau (1996), I find that the condition of communities not being able to protect the resources from outsiders is void given that there are well defined resource boundaries together with the common understanding that outsiders cannot access the resource.

---

[10] The regulation in the local language is available online from www.fishagri.gov.mv. The regulation is not available in English.

The 1992 state rules were originally initiated in response to reports of large scale erosion problems faced by many islands in the Maldives. Environmental degradation is the root cause for this intervention. Would not the local communities have enough knowledge about the resources and ecological processes to foresee and address this? I presumed that the 1978 state rules reflects such foresight and is a law cautioning on the use of sand and coral. This brings to the condition of the actors not fully understanding the ecological processes involved. I believe the issue is not of communities not understanding ecological impacts but more a lack of understanding of the scale and timeframe of the impacts. Extracting of coral from the house reef had not occurred so widely before. Therefore, the community may not have been aware of how much or how quickly erosion may occur on the islands. Acheson (2006) states that particularly during the early stages of resource extraction people may not be aware of the resources being under stress. Therefore, a lack of full knowledge of ecological processes may have caused the continued use of coral without further rules to manage the issue. This is evident as state regulations for the extraction of sand and coral was initiated almost fourteen years after the initial state law.

In examining the poverty leading to over-extraction of resources argument, I would apply the interpretation of Agrawal (2002) for the island communities. This is as I agree with the literature which shows that poverty cannot be a generalized cause of environmental degradation. I also believe poverty, as identified in the literature, cannot be applied to the island communities of the Maldives. In the case of traditional Maldive communities where there is abundant natural resources to sustain livelihoods combined with the simplistic lifestyle reported by participants this monetary definition of poverty does not hold.[11] This is especially true in a society where everyone is related either by kin or marriage. These social relations warrant caring and helping within a community. As participants had mentioned, everyone can build a house as they did not need to buy coral for building. Labour is not paid with money but is reciprocated within the community. Coral and sand were being used as a way to improve living conditions taking them from the basic need of a thatch house to more permanent dwellings. As explained by Naseer (1997) the building of coral houses followed improvements in socioeconomic conditions in the communities.

---

[11] Here I refer to the simple lifestyle as the the time prior to the emergence of coral housing. Today's lifestyle is marked with need for material things. The modern day gadgets within every household or held by an individual today is symbolic of the materialistic change.

Rather than poverty, the possible reason again goes back to the communities not fully understanding the impacts of extracting resources. As the immediate effects of taking coral cannot be seen it might not be of initial concern to the community members. The long term benefits of island protection tends to be given low importance over the immediate benefit of getting coral. Yet, once the effects of erosion were noticed by communities there was easy acceptance of state rules banning extraction of coral from house reef. Some communities like Kendhoo and Hulhudhoo took initiative themselves to develop local rules to address erosion issues, when no rules existed. In considering these observations, I believe the extraction of coral from the house reefs is more of a convenience for the communities and the continued extraction was because they were not aware of the impacts occurring at a short timeframe.

State intervention would be needed in such circumstances where communities have realized the impact of resource extraction but communities are not able to organize among themselves to address this. Although the communities of Kendhoo and Hulhudhoo had organized action this kind of initiative is not common in recent local governance. This is due to the centralised governance structure of the Maldives. As described in Chapter 1, the state is assumed as a formal rule-making body responsible for giving directive. The island offices take a passive administrative role in terms of governance. Discussing resource use and management with the community, especially the elders, I had come to learn this has not always been so. The elders talk of great leadership and autonomy of governance which had existed earlier in the islands. The local rules and norms which had existed earlier are being rapidly eroded by the need for formality and legitimacy.

The governance of resources by local communities, the state and local governance relationships and how local people come to care about and act in relation to their environment has been studied in literature (Nadasdy 2003; Agrawal 2005a; Agrawal 2005b; Willow 2009). Nadasdy (2003, p.1) discusses on the Canadian state's efforts to incorporate First Nations peoples into the state "by granting them a significant role in their own governance and say in the management of local land and resources". Nadasdy (2003, p.2) further discusses the making of subjects, through such modes as resource co-management initiatives, schooling and government programmes and highlights that the new relationship between First Nations people and state is only made possible through "bureaucratization of First Nations societies". Agrawal (2005a; 2005b) also looks at the making of environmental subjects in his study of Kumoan villagers and their interaction with the state, the forest and its resources. Agrawal using the term "environmentality" proposes the idea that "environmentalist logics, projects, and movements are forms of governmentality in the Foucauldian sense" (Cepek 2011, p. 501).[12] As community members became involved in these programmes they begin to internalize the beliefs about the environment and therefore, regulate themselves according to the wishes of the distant state.

In the island communities of the Maldives, the role of island offices and the IDCs, form the intimate government. Although IDCs play a similar role to the Forest Councils of Kumoan villages, their consultation role goes beyond the reef resources to all aspects of local governance in the community. In the case of Maldivian communities, the involvement of the state seems to be taking away the earlier leadership of the communities. For example, many communities described that the communities had chosen the island chiefs and the community had "paid" them through fish shares from the fishing boats. At most, the state would be notified by the communities when a new chief is chosen. According to participant narrations, later island chiefs were appointed by the state and also given a waged salary by the state.

Looking at the recent involvement of the state and historic accounts of management institutions present for the use of resources, I do not think concern for the environment is because of the creation of environmental subjects by the state. The ready acceptance of state rules on sand and coral mining is not a sign of the creation of subjects as described by Agrawal (2005a). Rather, I believe it to be an awareness and acceptance of the impacts of sand and coral mining on the island.[13] The initiative taken by Kendhoo and Hulhudhoo communities demonstrate them to be an autonomous body acting out of concern for the safety of the island rather than out of concern instilled through the state. Another example that demonstrates, earlier autonomy in resource governance is the state rule banning the use of nets for catching scads from the island lagoon. This had earlier been a local rule which became formalised as a state rule.

Nevertheless, attempts at creating environmental subjects have been ongoing in the Maldives. Schooling as described by Nadasdy (2003) has been one way for creating

---

[12] Although popularized by Agrawal, the term "environmentality" was coined by Steven Luke in his chapter for *Discourses of the Environment* (Cepek, 2011).

[13] While not all members from communities agreed on the contribution of sand mining to erosion, all members unanimously agreed that mining coral from the house reef contributed to erosion in the island.

environmental subjects, and a successful one, as can be seen by the concern that young school leavers show for the reefs and their role as giving protection to the island. From interactions with these youngsters, who mainly live away in the capital, and those residing permanently in the island, I know that both are concerned for island protection. Despite the common goal, the difference is in that one has been taught to be concerned for nature in a particular way, while the other has learnt through experiencing the impacts of their actions; one through western scientific knowledge and the other through local knowledge. For one the environment is a distant imagined place where they are exhabitants and for the other it is a place they live in as inhabitants.

Another seemingly successful way of creating subjects has been the many awareness programmes held locally by government officials. Here local community are taught key terminology relating to environment and its protection. Nadasdy (2003) describes how First Nations people had to learn new ways of speaking and thinking, like the bureaucrats, to take part in land-claims negotiations and co-management initiatives. Similarly, local people learn new jargon and they talk back with the government officials using this jargon. This does not mean they have been converted to environmental subjects. My interactions with community members show that this is far from the truth. Initially, participants talked with me in a similar manner using the correct words like "protected", "not polluting" and similar environmental jargon they had learnt through state programmes. After spending more time with participants and in informal settings as well as making more clear my identity as a student outside state involvement, I got to hear less of such terminology. People were more open to share their views on these awareness programmes held by the state. Naasih, a fisherman in his mid forties from Hulhudhoo, shared his views regarding the awareness information given by staff from the Ministry of Fisheries, on proper handling of fish when out at sea.

> "They gave [information] on how to handle fish while out fishing in the boats. They explained. But even if they are educated they can't know more than us. They cannot have more experience than us in handling fish in a fishing vessel like this."
>
> ނާސިހު: އެމީހުން ދިނީ މަސްވެރިކަމުގެ ތެރޭގަ ދޯނިފަހަރަށް އޭގެތެރޭގަ މަސް
> ގެންގުޅެންވީގޮތް. އެމީހުން ކިޔައިދިނީ. އެހެންނަމަވެސް އެމީހުން ކިޔަވައިގެން އައިސް
> އެމީހުންނަކަށް ނޭގޭނެ އަހަރުމެންނަކަށް ވުރެއް ވަކިން. ވަކި ތަޖުރިބާއެއް އެމީހުން ގާތަކު
> ނުހުންނާނެ މީގެ މަސް ދޯންޏެއްގަ މަސްގެންގުޅުމަށް.

Naasih explained that he would be more aware of the importance of proper handling of fish as he knew the importance of fish being fresh. If the fish had gone bad then he is not able to sell it to the collector vessels. As his livelihood is at stake then would he not take utmost care in ensuring the freshness of the fish. For Naasih, the information is useless, especially coming from someone who does not understand or feel the importance as he does. There are other similar examples of their personal views which contradict the front they show to the state officials. Such examples include their views on sand mining and impacts on beach erosion, climate change and associated impacts like sea level rise and impacts on coral. These contradictions are based on their experiences and understandings of the local environment, rather than information from global sources.

As can be seen people living within the environment do not necessary hold the same environmental views they appear to show to government officials. Things are not as simple as they appear on the surface, and before I undertook this research and spent time with the communities, I had been under the impression that the local awareness workshops I had taken part in had been quite a success. Learning there is more than what is superficially seen, I find this an interesting area to focus more research. Research into traditional local governance systems and how their relationship with the state has changed is an area in which future work could be directed.

4.3.3 State Rules and Local Implementation

In this discussion of the implementation and enforcement of state rules I would like to use a general reporting which does not identify specific communities by name. I had discussed with the community about reporting sensitive information I find in the field and if such a topic had come up during discussions I had at the time specifically asked if they would like me to not report these things. I was always given a response to the manner that what they wish to remain hidden they would not share with me. Despite this, I feel obliged not to refer to specific communities in the following discussion.

In 1992, preliminary state regulations banning mining of coral from island house reefs and regulating mining from other permitted areas were introduced (Latheefa, Jameel, Mohamed et al. 2005). Coral mining was also prohibited on atoll rim reefs and common bait fishing reefs. Under these regulations anyone intending to build any structures requiring coral has to lodge an application for coral with the Atoll Office (Latheefa et al. 2005). Thus, the amount of coral needed by the person is estimated by the island office. All island offices are also required to keep a log book of the amount of coral mined and used. More stringent controls and regulations including the banning of sand mining were introduced in 2003.

Through a combination of government regulations, public awareness and a reduction in import duties on aggregate, mining of coral was stopped. However, this led to an increased use of sand for making cement blocks. With the support shown for the stopping of mining coral most of the state rules and local implementation focused on the taking of sand. I observed that in each island the rules were enforced to a way most compatible with the needs of the people.

After discussion among the officials and members from the different communities I came to realize that the implementation of these state rules varied among the communities. These differences included the way of informing the community members, levels of implementation and enforcement, monitoring of state rules and even interpretation of rules. After spending time in the communities, I came to understand these different ways of implementing as a necessity based on the individual characteristics of the community. The history of resource use and extraction, community size, the abundance of the resources and location of alternative areas for extraction are all relevant factors for the way in which communities accept and implement state rules.

First looking at ways in which information about the state rule was communicated the communities were informed at different times. In one community people were only formally told of the ban as taking effect on the day announced. The reason provided by the island chief was that this was deliberately done based on his experiences with banning coral mining in the community. News of the future ban on mining coral from the house reefs was met with people stockpiling coral before this came into effect. This was confirmed by participants. Clark (2001) also reported seeing such stockpiles during her visit to islands in Baa Atoll and Vaavu Atoll. The chief also added that the news of the sand mining ban would not be a total surprise as the approach used by the island office was to spread a rumour on the likelihood of such a thing happening. A lot of uncertainty about it actually happening was also included in the rumours. In most islands people were aware of such a thing happening even before the formal announcements. This allowed many people to complete the houses they had started to build.

The role of gossip in resource management and environmental regulation has been discussed to some extent in literature. Gossip, especially negative gossip, is seen as an informal way for monitoring and enforcing regulations and to ensure cooperation, especially in small, close-knit communities (Hayami 2001; Gibson, Williams and Ostrom 2005; Jenny, Fuentes and Mosler 2007). Compliance through the spread of gossip on non-compliance by individuals is not limited to natural resources only. It is a norm-based enforcement system which is essential for all aspects of compliance in small communities (Jenny et al. 2007; Leeson and Coyne 2012 (forthcoming)). This is especially low cost and effective as "members can observe the behaviour of others fairly effortlessly as they go about their daily lives" (Singleton 1998, p.24). According to Hayami (2001), the rules have to be well defined and developed by people's consensus if such mechanisms are to be effective. Gossip has been discussed in literature mostly in relation to its role as a way for enforcement using "everyone’s fear of the eyes and mouths of their fellow community" (Hayami 2001, p. 297). In the case reported above, it is the island chiefs who are making use of this informal communication system in the implementation of resource management rules. The use of these informal enforcement mechanisms in this manner is not discussed much in literature. Singleton (1998) suggests such social norms can be a useful mechanism for enforcement of state rules when a level of trust is established with state personnel.

The level of strictness by which the rules were implemented and monitored varied among islands. For example, initial regulations required careful monitoring and reporting of the amount of sand mined in the island by the island office. In some islands reporting involved community members informally telling the island chief or other official that they will take some sand. In others more information is sought on how much sand is required, but these still remain verbal exchanges with no written records. There were also communities where the monitoring and reporting were done more formally. Officials from the island office from one island used a system where the person intending to take sand had to provide a receipt of purchase of cement when asking for permission to collect sand. By knowing the amount of cement purchased island officials were able to permit the correct amount of sand. Officials would also go with the person to show where to take sand and later see how much was taken. I found in islands with smaller populations the implementation and monitoring of state rules was less formal. This may be a result of the close knit nature of the community and increased levels of trust. Even if there were any violations it will be known almost immediately due to the efficient system of news spreading in the communities.[14] The basic understanding in all communities was that sand was only used for personal use and not as a business for making and selling cement blocks.

Following the ban on taking sand from the island, alternative sites in the atoll were provided to the communities. In all islands it was reported that the identification of these sites was done after consultation with the community. The chosen sites were sandbanks where sand accrued. Consultation at island level also ensured local bait fishing grounds were not disturbed and fairness in access by all island communities in the area.

All island offices reported good support and compliance by the communities. Three of the communities reported taking sand for ceremonial purposes even after the ban, but only two communities still continue the practice. These communities are mentioned as Community A and B in Section 4.2.2. In the community where taking stand had stopped, initial taking of sand was allowed so that this can be phased out slowly. This is as the people have been used to the custom for a long time. A similar thinking is applied in Communities A and B too for stopping the taking of sand. The chief of community A brought out the example of the prohibition of alcohol in Islam as an example of how rules should be applied. He explained that as drinking alcohol was a big part of Arab culture when the Prophet Muhammad (PBUH) was sent with the message of Islam, the prohibition came gradually step by step. All three communities where the taking of sand continued were communities where the customary uses were still carried out. Where traditions are firm it would be a heavy impact to suddenly stop them. The ban on getting sand from the island meant people would have to spend time and effort and even tangible fuel costs to get sand. This would pose a problem for people to continue with their traditional use. Therefore, it seemed reasonable for the island leaders to accommodate these needs of the community and adapt their implementation of the state rule.

---

[14] I was surprised at how quickly news spread in the islands. News could be about anything, even trivial things. I thought everyone knew what everyone else was doing every minute of the day. When I arrive on an island the very moment I seem to find everyone knows who I am, what my business is, where I am staying or where I was having my lunch.

In this regard, where sand is taken for customary use, the island authorities do not regard this as actually violating the state rules. They have within the communities redefined the banned sand to be that taken for building houses or commercial purposes. This is necessarily not a formal definition but an informal and unspoken acceptance by the whole community, between the people and the officials. The island chief of Community B explained taking sand is not done by a permit as such but is something that everyone does by local custom. In a similar vein the island chief of Community A stated that traditions are unwritten laws and perhaps even above the state rules. This shows the importance given by the communities to customary use of sand. Any reports of sand being taken for other purposes are investigated by the island office and prompt action is taken. In islands where the customary use has already been phased out this issue of taking sand did not arise and people had accepted getting or buying sand from miners.

Ambiguities in the formal definitions of sand have also allowed the continuous taking of customary sand. The Island Chief pointed out that under the definitions of the state rules "*veli, gaa* and *akiri* (sand, coral and coral rubble)" are prohibited to be taken from island beaches but the taking of *kashiveli* is not strictly defined.[15] Therefore, under the technicalities of terminology and specificity, the state rules are not broken. He adds that this type of sand is only found in their region and only used by the people of that atoll and the adjoining one.

> "Maybe that is why in the Environment Protection Law there is no mention of *kashiveli*. It is an issue isn't it. *Akiri, gaa, veli, kashiveli* is there [in the sand classifications]. But *kashiveli* is not something that the people of Maldive islands know about. [They] haven't seen it. They don't even use it."
>
> ކަތީބު: އެހެންވީމާވެސް ކަންނޭގޭ ކުރީގަ މި ތިމާވެށިރައްކާތެރިކުރުމުގެ ޤާނޫނެއްހަދުނުއިރުވެސް ކަށިވެލީގެ ވާހަކައެއްނެތް. އެހެންވީމަ މައްސަލައެއްނޫނުދޯ އަކިރި، ގާ، ވެލި، ކަށިވެލި މިވަނީ. އެކަމު ކަށިވެއްޔަކީ މީ ދިވެހި ރާއްޖޭގެ ރަށްތަކުގެމީހުން ދަންނަ އެއްޗެއްނޫން. ދެކޭ އެއްޗެއްނޫން. އެމީހުން ބޭނުންކުރާ އެއްޗެއްވެސް ނޫން.

The island chief adds that this tradition of putting new sand for Ramadan is fading away on its own. First, there is a limited area available for sand to be collected and second, people are opting to lay cement blocks on the courtyards. "In about two to three years this

---

[15] See Table 4-1 for definitions of the different local classifications of sand.

will go away completely. So we don't keep so much to the laws on this one. They are the public." A further reason I can see is that with many of the younger generation now living away from the islands and the resource, the importance of traditions will fade. Those who upkeep them are the elders who stay on the island. So when their generation is gone the newer generations will not have the same attachment to these customs and hence, would not see the difference in a sand laid courtyard and a paved one.

Other than the special case of customary use of sand, both island officials and other community members agree that people almost always comply with state rules. There have been very few or almost no occasions of violations. In cases where there were, the officials can count them to a couple of incidents since state laws were enforced. Apart from one of the communities there is no formal police located in any of the islands. As said by one official, the island office is the multi-function place of authority.

> "When we were little we were very scared to come to the office. ... The [island] court is there. People are given penalties from there. In Male' the court house is somewhere else, the police is somewhere else, president's office is another place. In the islands all these places are the [island] office."
>
> ކަތީބު: އަޅުގަޑުމެން ކުޑައިރުގަ މި އޮފީސްތެރެއަށް ވަންނަންވެސް ބިރުގަންނާނެ. ...
> ކޯޓުވެސް ހުންނާނީ އެތާ. މީހުންނަށް އަދަބުދޭނީ ވެސް އެތަނުން. މިހާރު މާލޭގަ
> ފާޑިޔާރުގެއަކީ އެހެންތަނެއް، ސިފައިންގެއަކީ އެހެންތަނެއް، ރައީސްއޮފީހަކީ އެހެންތަނެއް.
> މިހުރިހާ ތަނަކީވެސް ރަށްފުށުގަ ރަށުއޮފީސް.

Although island offices have these multi-function roles they work with a limited number of staff. Thus, they do not have the staff to monitor formally for illegal sand mining from the island beach. Therefore, enforcement of the state rules as well as other local rules are dependent on self-policing and reporting by the community. All communities mentioned that the community members do report anyone not complying. In a small community it is very easy to know when something has happened and who has done this. "In a small community everyone is watching everyone. Gossip about one’s misconduct is circulated by word of mouth faster than modern communication means" (Hayami 2001, p.297).

Discussions with participants suggest initially there was high compliance to the state rules for the use of sand and coral. Participants mention that in each community or group there would be the odd person who might not obey. Ostrom et al. (1999) identify them as free-riders. Due to the characteristic of non-excludability of common pool resources it is easy for people to free-ride (Tang 1991). The acceptance of the rules by the island communities as a whole ensures good monitoring and reporting for these violators. Literature cites that gossip can be an effective, low cost mechanism to enforce rules in such small, close-knit communities (Singleton 1998; Jenny et al. 2007; Leeson and Coyne 2012 (forthcoming)). Rules enforcement can be effective through the acceptance of the rules by community members (Hayami 2001).

Reporting of non-compliance are done in an informal manner where the information is passed to the community officials outside the island office. In very few cases people may go and report formally to the island office. In one community, the island chief explained that having to come to the office was among the reasons people did not report on violation of state rules. In such a small community having to come to the office loses the anonymity of the reporter and this is something people do not like. This is because once you report someone, it is the same person you have to face and live within the community, and it is better for relations not to report them. Allowing the use of mobile phones for discretely and confidentially reporting to the island chiefs had increased reporting of violations of state rules.

According to island officials it is not very common to have violations and for those which get reported it is never possible to find evidence pointing to a certain person or group. When island officials arrive at a reported site the only concrete evidence would be signs of taking sand and piles of sand left behind. In a small community, it is easy to guess who these people are but harder to take action legally without proper evidence. So at most, the suspected person(s) are asked to come into the island office and to advise them on the bad effects of such offending. This may include advice on the impacts on the island, the starting of a trend where the community starts to break these rules and being a responsible member of the community and leading by example.

The enforcement of any harsher penalties reported by islands was about one or two. The penalties enforced are gradual increases from advice to taking written statements, issuing fines and in very rare cases banishment from the island for an appointed period. Banishment is one of the harshest penalties and was reported in only one island and this was a single case.

Banishment has been reported as the ultimate punishment for free riding in traditional Japanese villages and Marovo, Solomon Islands (Baland and Platteau 1996). Island chiefs further added that they are quite reluctant to give harsh penalties for the very first time a person offends. Initially advising seems to be sufficient to prevent repeat incidents. According to the Island Chief, if anyone was found with sand they are asked to put it all back. This is also seen as a form of punishment. They spend double the time and effort and in the end get nothing.

> "About sand. If they have to take and put back [the sand] they took with their own hands and put into bags that is also a big punishment. Our decision to impose fines was not because we needed money. To stop these things. When we set the fines between Rf 500 to 5000 it was not to fine them Rf 5000. If the fine is large this will definitely help stop the behaviour. In addition to the fines we decided not to give [the sand] they took so this will not be repeated. Not for any other purpose."

ކަތީބު: ދެން ވެލީގެ ކަމުގަ. އެބޭފުޅުން އަތުން ނަގައިގެން ގޮނޑަށް އަޅާފަ ހުންނަވާތި
އެބޭފުޅުން އަތުން ގޮސް އެތަނަށް އޮއްސާލީމަ އެވެސް ވަރަށް ބޮޑު އަދަބެއް އެއީވެސް.
އަޅުގަނޑުމެން ޖޫރިމަނާ ކުރުމަށް ހަމަޖެއްސީވެސް ކޮންމެހެން ފައިސާ ބޭނުންވެގެންނެއްނޫން.
އެކަން ހުއްޓުވަން. އެހެންވީމަ 550 އާއި 5000 ރުފިޔާއާދެމެދު އަދަދެއް ހަމަޖެއްސީ
5000 ރުފިޔާއިން ޖޫރިމަނާކުރާކަށެއްނޫން. އެޖޫރިމަނާ ބޮޑުވީމަ އެކަން ހުއްޓުވުމަށް
މަގުފަހިވާން ކޮންމެ ގޮތަކަށްވިޔަސް. ދެން ޖޫރިމަނާކުރުމުގެ އިތުރުން އެބަޔަކު ނެގިއެއްޗެއް
ނުދިން ހަމަޖެއްސީވެސް ތަކުރާރުނުވުމަށް އެކަން ކުރިއަށްނުދިއުމަށްވެގެން. އެހެން އެއްވެސް
ބޭނުމަކުނޫން.

It is often said to young children if they are misbehaving that they will be taken to the office. Therefore, people grow up conditioned to the idea that going to the office means you are in trouble. One island chief said that having to come to the island office itself is seen by the community as a punishment.

> "They will ask why were you summoned to the office. What crime did you commit? At that time these services given by the office was not given. Most times [people] will be summoned to the office due to some fault. Or regarding some issue."

ކަތީބު: އިހުރުން ސުވާލު ކުރާނެ ކަލޯ އޮފީހަށް ހާޒިރުކުރެވުނީ ކީއްވެހޭ. ކޮން ކުށެއްކުރީ ކަލޯ
ހޭ. އެދުވަސްވަރަކީ މިއޮފީހުން ދޭ ޚިދުމަތްތަކެއްނުދެވޭ. ދެން ގިނަފަހަރަށް އޮފީހަށް
ހާޒިރުކުރެވުނީ ކޮންމެވެސް ކުށަކާ ގުޅިގެން. ނުވަތަ މައްސަލައަކާ ގުޅިގެން.

Therefore, this social questioning on why the person was summoned to the office is felt as an embarrassment by people and they do not want this to happen again. Studies in small village communities have found, loss of reputation has a deterrent effect on breaking rules (Wade 1994[1988]). According to the Chief, the island office now provides other services such as banking facilities, collection of pension and retirement funds for the people. Therefore, this view is slowly changing with the generations and times.

These social sanctions and policing ensure that state rules are monitored and enforced. I found that the level of monitoring and enforcement of these state rules were much better than for those state rules governing reef resources within the atolls. For example, fishermen from many communities reported that despite the ban on using scuba gear for harvesting sea cucumbers people still continue to do so. As these resources are not near or belong to part of an island there is no one responsible body to monitor these illegal activities. The fishermen who attempt to report these cases were blocked by various reporting barriers caused by the lack of a reporting mechanism. For the case of sand and coral mining it may be easier to implement the state rules as the island offices are given the mandate to monitor the resource use. Baland and Platteau (1996) found that monitoring is easy and successful when the resource is located close to the user group and is highly visible.

4.4. How Do Communities Value Sand and Coral?

In this chapter I have looked at how sand and coral have been and are being used in these small island communities. The formal and informal rules and behaviours of the people for using and managing sand and coral have also been explored. The ecological, cultural, social and economic values of the resources are important factors influencing how the resources are used and managed. In this section I would like to examine further the uses and management institutions in order to interpret the values placed by the communities on sand and coral inside the house reef.

4.4.1 Traditional Values

Looking at the traditional uses of coral and sand the uses are linked to cultural and social aspects of the society. The use of sand is especially reserved for religious festivals and significant occasions like marriage celebrations and circumcision ceremonies. Coral is most often used for important buildings like the mosque. The use of these resources for only these special occasions signifies the special value of these resources. For example, wearing a special dress and not just any everyday clothing marks the specialness of a wedding day. At the same time the dress is special and valued as it was used for the special occasion.

In addition to the spiritual significance these festivals are important social interactions within the communities. The preparations as well as the actual festivals bring together the community members. Whether it be a communal festival or an individual occasion, family, friends and neighbours work together. For example, although traditionally the *mauloodh* festival were for singing praises of the Prophet Muhammad (PBUH) the narrations of the *mauloodh* from participants was focused on the social interactions among the communities. All participants remembered with great joy and fondness of the preparations for the *mauloodh*, the many visitors that come from other islands and the great friendships that are developed through these social interactions. As described by Fazna, below, the preparations start with fishing to make food and decorating of houses and roads with sand. This festival shows much community solidarity among the members. These social ties are extended further when visitors come from other islands.

> "In this island too when it is *mauloodh* time people will first go fishing. ... After going fishing everyone, every household will have to cook a meal. For example each five person household will make one set meal. ... We invite all people from near this atoll."

> ފަޒްނާ: މިހާރު މިރަށުގަވެސް މައުލޫދުކިޔާއިރުގަ އެންމެފުރަތަމަ މަހަށްދާނީ. ... ދެން ހަމަ
> މަހަށް ގޮސްގެން ހުރިހާ އެންމެން ނަރްވެސް ކޭންކޭން ހަދަން ހުންނާނެ ގޭގޭގަ ވަކިވަރަކަށް.
> މިހާރު ފަސް މީހުން ތިބޭ ގެއެއް ވެއްޖިއްޔާމު ކޭތަށެއް އެކޮޅަން ހަދާނީ. ... އަޅުގަނޑުމެން
> ދެން މިރަށުން ދެން ކިޔާން މި އަތޮޅުގެ ކައިރީ މިހުރި ހުރިހާ ރަށްރަށުމީހުންނަށް.

Strewing new sand in the houses for Ramadan is a long standing tradition that has almost died due to the difficulty in getting sand. From observations and discussions with community members I see that the letting go of these traditions is done with much reluctance. I had discussed earlier about Communities A and B which, despite state bans, still persist in keeping the traditions of strewing sand in the houses for Ramadan. They continue taking sand from the beach for customary use yet buy sand for building their houses. I began to wonder why traditional values of sand had not eroded away here like in the other communities. One reason may be that the sand on the beach in communities A and B is different to other islands and also different to that used for building. Perhaps the need for this specific sand is why people continue to take sand from the beach.

Another plausible explanation that I could think of was that these two islands were physically very different to the other communities. They were bigger and the type of sand deposited on the beach is different and the island system was more as an interconnected group of islands than single separate islands. This might vary the level of erosion impacts felt by the communities. For example, communities live comparatively closer to the shore on small islands, where taking sand has been stopped.[16] Therefore, for those small communities protecting the island from the threat of erosion may seem more valued than the continued use of sand for customary uses.

As can be seen there is no single value for these resources. The values regarding sand and coral change with environments as well as the social actors within them. Both our natural and social environment impact how values are formed and at the same time our values influence ways in which we interact with these environments (O'Brien 2003). The difference in the traditional use of sand in Communities A and B and other communities may reflect how the differences in the physical environment of the islands have led to the formation of different values towards sand.

Pluralist views of value acknowledge that multiple values exist. These values are competing and often conflicting (O'Neill et al. 2008). Sometimes values between our individual self and our community self may be in conflict. According to Simmel (2004[1907]) humans, throughout their whole lives, are constantly making value judgements. In making these judgements we compare the different values we hold and we prioritize them based on which values are more important to us; making value trade-offs (O'Neill et al. 2008). The work on human values done by Rokeach (1973) and Schwartz (1992; 2006) use this fact that humans are always prioritizing or ranking the importance of various values.

---

[16] These are based on my observations of the physical attributes of the islands I visited and some knowledge I had gained of ocean systems during my earlier studies. Perhaps a study of these differences and erosion impacts would be useful as future work for someone interested in physical geography.

4.4.2 Use Values vs. Protection Value

A finding for me at this point is that values are multiple, complex and keep changing with time and human experiences. There exist multiple dimensions to this change. Each new interaction or an experience a person has adds to their construction of value regarding the reefs. As the communities evolved the ways they interact with sand and coral has changed too. For example, through the times, sand valued for its customary use, has become more a commodity useful in the enhancement of individual lifestyles. Increased economic costs for purchasing sand has seen a disappearance of the cultural and social values of sand in many communities. All these reflect changes in the use value.

The increased commercial use of sand and coral led to increased rules for their management. These increased rules and the subsequent banning of the extraction of these resources reflect an awareness of the impacts, on the island, of taking sand and coral from the reef system. It is also a realization by the communities of the importance of the protective function provided by the house reef. Loss of the protection meant permanent eroding of the sand from beaches. In the judging and prioritizing minds of the people the values to be judged are the use that they get from the coral and sand as opposed to the protection provided by the reef. The banning of taking sand and coral and the acceptance by the communities of this rule is an affirmation that for the communities, although they needed coral for building houses, the coral from the house reef is more valued for the ecological benefit. With plentiful reefs, more coral can be obtained with a little extra cost to build their houses.

Small coastal communities understand the perils of the seas and value their ecosystems with this increased understanding. Pollnac and Johnson (2005) describe an Indonesian fishing village, renowned for using underwater explosives during fishing, but they do not practice these methods in the reefs off the coast of their village. The reason they provide for this is because the coral reefs protect their village from seasonal high waves. The villagers also do not cut the mangroves behind the village, for similar reasons, but they cut mangroves from other areas. In this example, the community places a higher value on the ecological function of the resources near their village, while for resources away from their village exploitation for economic benefit is given prominence.

In both cases preservation of ecosystems is not the main priority of the communities. It is the benefit, in terms of continued existence on the island that is given priority over the use value or economic benefit of extracting coral and sand. Without the existence of the island where do people build their houses of coral and sand?

4.5. Chapter Conclusion

Sand and coral are important for the island communities of the Maldives as it is these resources which ensure the existence of the islands formed from sediment from the reef environment. As a relatively stationary resource sand and coral had been easy to access and use for these communities. These resources had been traditionally used for customary purposes. Sand had been used decoratively for religious and cultural festivals and coral had been used for the construction of communal structures such as mosques and also for rituals such as making of gravestones. The limited number of resource users and the low resource use compared with the abundance of resources meant that resource use was able to be continued without the need for management rules. Social norms guided the use of these resources.

People living in the communities do not intentionally set out to destroy the environment they live in. The environment and its resources are seen as gifts for them to make use of for improving their lives. So any resource which is of use will be used to fulfil the needs of the society. The norms among the communities showed that these resources are not used in excess. Limitations on time and cost also contribute to this conservatory approach. The value of a resource comes from the way that people interact with it. Thus, as the interactions change, the value also changes and vice versa.

Increased socioeconomic conditions of the communities meant that these resources were used on a larger scale for construction of individual dwellings. This also resulted in the need for more rules in the management of these resources. Among the many resources within the house reef, the use of sand and coral is the resource which is most governed by state rules. This perhaps is due to the stationary nature of the resource. It is also because the severe impacts of erosion on these islands require some level of outside influence. As such state rules remained as an over-arching rule which is implemented locally. In this regards the ways the state rules were implemented varied among communities, based on the level of experience they had with the erosion impacts, the level of use of the resources, the types of use as well as the physical characteristics of the resource. It should be noted, that the communities of Kendhoo and Hulhudhoo, on being aware of erosion problems had taken initiative in forming their own rules to manage the extraction of coral and sand, respectively.

The many ways communities use and manage sand and coral are used to infer how the communities value these resources. A common value I found in all communities is the importance of the physical protection function of the corals and sand. Without the land the community would not exist and loss of coral and sand from the island environment cause this existence to be threatened. The survival and protection of the community is valued above all. Benefits and costs cannot be measured in the same units. Dollar costs cannot be compared with the unquantifiable benefits from island protection. "Money is not a neutral measuring rod for comparing the losses and gains in different values" (O'Neill et al. 2008, p.79).

The environment does matter, not merely for its economic benefits but also for the intimate connections that binds a community to its environment; generations of a community living in a particular environment holds a history linking the people to its environment. The process of *veli-hedhun* (making sand) for strewing in the houses for Ramadan shows this cultural and traditional links to the land. With the interactions that occur in making sand, the elder passes a part of the history and knowledge to the younger generation and thus ensures the continuity of this links to the land and its history.

An exploration of the values that the communities have for these resources show the difficulty in inferring values for natural resources. Human-nature interactions are complex and this is reflected in the difficulty of inferring human values towards nature and its resources. It is impossible to identify which values are more important for a particular resource. In each case we have seen the values changing temporally and spatially. In addition, changes in value are also dependent on the community characteristics as well as the physical characteristics of the island. As can be seen, identifying one true value is a near to impossible task. Sometimes it is hard to identify which function or use is more valued. The communities are continuously making trade-offs between each value and gives prominence to that which in that time and space seem most important to the community. As can be seen in Communities A and B for them traditional values of sand are deemed important enough to find ways to evade the rules banning the extraction of sand from the beaches.

Sand and coral are relatively stationary resources within the house reef. When it comes to more mobile resources, scholars agree that the use of mobile resources are harder to manage (Schlager, Blomquist and Tang 1994; Pollnac and Johnson 2005). Mobile reef resources such as fish are often found in the island lagoon and these are important resources for the communities. In this chapter I have shown the difficulty in identifying single value for the stationary resources, sand and coral. While this is so, I do not think it is a reason to hinder such inquiries. In the next chapter I explore the use and management of some of the mobile reef resources in the island lagoon to identify the ways in which communities value these resources.

5. Fish in the Island Lagoon

5.1. Introduction

The island lagoon, bounded by the house reef and the sandy beach of the island, is used and enjoyed by the people who dwell on these islands. The lagoon is the swimming area enjoyed by the young, the men and the women of the community. An important reef resource for the community is the fish in the lagoon. Unlike sand and coral, fish is a mobile resource and hence their availability and duration of stay varies from island to island. In this chapter I will be exploring how communities interact with fish in the lagoon in order to understand how this mobile and unpredictable resource is perceived and valued.

All fish in the lagoon are mainly reef fish and the communities make distinctions based on physical characteristics of the schools of fish and how the communities interact with them. In my visit to the communities I observed three main distinctions of reef fish. These are (i) reef fish that reside in the lagoon all year through, which will be called "lagoon fish" (ii) schools of dense "scads" that come to find shelter in the island lagoon and (iii) schools of mature reef fish that occasionally enter the island lagoon, which will be called "community fish".

5.2. Interaction with Fish in the Lagoon

Lagoon fish have not been significantly used in the communities. Even today in most communities, lagoon fish are caught by young children for recreation but there may be a few who catch them for food. Such fishers mostly existed in the larger communities of Hulhudhoo and Meedhoo. Any excess fish are sometimes sold in these large communities but not in the smaller communities. Mohamed Jameel, the Bodu Katheeb of Hulhudhoo summarises well about how lagoon fish are used in the community.

> “Now there are people who go as a habit because of their nature. Go and throw nets by habit. Some go for fun too. Sometimes there may be two or three purposes. That is go as habit and at the same time get some reef fish for the family to eat. Isn’t it?”

> މުހައްމަދު ޢަލީ: މިހާރު މީގަ އުޅޭތީ ތަބީޢަތުން ވަސްނިޔާވުމުން އުޅޭތަ.
> ތަބީޢަތުން ޢާދަކަން. އެކިފަހަރު ކުޅިވަރަށް ދަތުރުކުރާ ގޮތުން. ބައެއްފަހަރު އަތޮޅުން ދާ ދިޔަން
> ފަހެއްކުރުވެސް. އެއީ ތަބީޢަތުގެ ގޮތުން ދާނެ އާއިލާއަށް ކެއުމަށް ފަރުމަސް ވެސްލާ. އެހެންނުންތޯ.

According to participants, even in the larger communities, the use of lagoon fish is not significant. The communities relate scads and community fish as significantly more important. Therefore, the discussions in the remainder of this section will be mainly focused on scads and the schools of mature reef fish.

5.2.1. Schools of Dense Scads

Schools of dense scads are locally referred to as *vehimas* or *mushimasgandu*. These scads are small in size and include fish such as mackerel (*mushimas*), bluestripe herring (*gunbalha*) and silversides (*thaavalha*). It is common for schools of scads to find shelter in the lagoon of reef islands. Local fishers explained *vehimas* as large schools of fish that come into the lagoon when the sun comes up and leaves when the sun sets. Like this the fish will remain, coming in and going out daily, for a lengthy period. Scads do not come into all islands and even when they do the time of season it comes and the length of stay may vary, on average staying a couple of years. The island of Thakandhoo was where the scads had stayed longest. "For about fifteen years. Continuously every day. [The fish] come in at dawn and go out at sunset" said Abdul Raheem the Katheeb of Thakandhoo

> ޢަބްދުއްރަޙީމް: ގާތްގަނޑަކަށް ފަނަރަވަރަކަށް އަހަރު ވާންދެން. މެދުނުކެނޑި ކޮންމެ ދުވަހުވެސް.
> ފަތިހު ވަންނާނެ އިރުއޮއްސުނީމަ ނުކުންނާނެ.

Participants explained that initially juvenile scads come in. Plate 5-1 shows a school of young scads that have come into the island lagoon. This is how the initial coming of the scads would appear. According to participants the school will continue to increase every day until "the whole lagoon is black". Women from Dharavandhoo said that sometimes when they go to wash the pots and pans at the beach, the fish would jump into them. The scads will remain in the lagoon and grow to maturity in the shelter of the lagoon. Scads are considered to be a common pool resource for the whole island community to use. In some communities these fish were not taken until they reached maturity. Such rules and norms of use will be discussed later in 5.3.2Section 5.3.2.

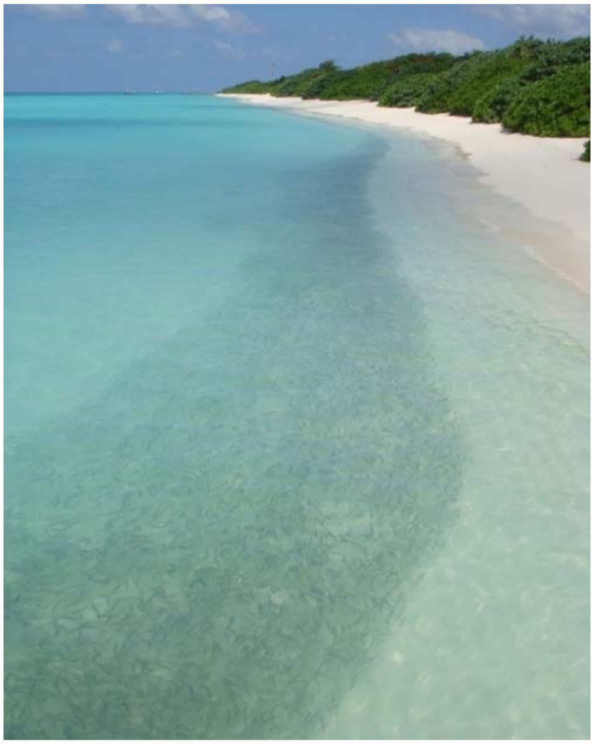


Plate 5-1. A school of young dense scads in the island lagoon of Hanimaadhoo.

The scads are mainly used as food for home consumption. When scads used to come in plenty they provided a continuous supply of fresh fish that people could go and take when needed. Although I was not able to see scads in any of the islands, I was fortunate to have seen them previously during a visit to my grandparents, in Haa Dhaalu Nellaidhoo. Having seen the community of Nellaidhoo use and interact with the resource I was able to have a greater understanding of the discussions with participants. Just before lunch time people would be in waist deep water fishing with a line and hook and a container to put the fish in. When they had caught enough for lunch they would return home. I remember my aunt making fish soup and deep frying the fresh mackerels for lunch. As participants explained the fish is there to take whenever it is needed for meals. There is no hurry to catch all the fish as they remain in the lagoon for a long period of time. In fact, people work to ensure they stay there for a long time.

In Thakandhoo and Dharavandhoo participants told of cooking and preserving scads. The main reason for preserving scads for the people of Dharavandhoo was to send the fish to their families who live in the capital, so that they could enjoy it too. Many people from Dharavandhoo moved to the capital for employment and education. The reason for processing in Thakandhoo was due to its abundance in the island lagoon. The people cooked and preserved them for use when the tuna fishing season was over. The people of Thakandhoo also made a thick paste called *rihaakuru* with the stock left after cooking the scads. Usually in the Maldives, the paste is made from the stock left after cooking tuna. *Rihaakuru* can be stored for a long time and is used when fishing is poor. All households would have a stock of *rihaakuru.* Thaufeeg, a reef fisherman in his forties from Thakandhoo, remembers a year when scads were so abundant that people had enough *rihaakuru* to sell. As a general rule scads or its products are not sold in the communities. Scads were more valued for home use than for their value as a commodity. In fact, this was the only island in my visits that people told of selling scads *rihaakuru* and this was also due to the abundance of scads. Some people saved enough to go on the pilgrimage to Mecca that year. It is a year fondly remembered by many on the island.

Fishing is something that is also enjoyed by almost everyone in the communities. For example, the work involved in tuna fishing is hard work but the fishermen describe fishing from a large school with much excitement and joy. The excitement is always there in their narrations of fishing stories. Therefore, the presence of the schools of scads literally in their front/back yards is considered something to be enjoyed. Fishing from the school of scads can be done at a leisurely pace and does not involve the long hours of being in a boat under the blazing sun. This is also ideal for the young children to enjoy their hand at some fishing. The recreational aspect is more in Hulhudhoo and Meedhoo. People from the communities said that it is common for children accompanied by their mothers to go and fish in the harbour in the late afternoon. In all islands this is a time for relaxing and socialising after the day's hard work. It is common for women and children to go and spend time at the beach for socializing. The importance of lagoon fish as a food is less here, and this may be because the island has a good tuna fishery. In both Dharavandhoo and Thakandhoo women reported catching scads in scoop nets. When groups of trevallies come into the lagoon to feed on the scads, the scads move towards the shore in panic and they would come on the shore in large numbers. The fish that come on shore are scooped out using scoop nets.

The large amount of small sized scads are sometimes used by fishermen as bait. Scads that are in the lagoons of uninhabited islands are mostly used in this way. For scads in inhabited islands prominence is given for use as food by the community. If they are plentiful, like in Thakandhoo, then fishermen would use scads as bait. People of Thakandhoo reported giving scads as bait to fishermen from neighbouring islands too. I should note that people from Dharavandhoo were very insistent that any kind of live fish would not be given away to people from other islands for fear that they would make *fanditha,* a form of dark magic practiced in the islands, to lure the scads away from the island. The use of *fanditha* is an important element in the interaction with scads and this is discussed in Section 5.3.1. The use of *fanditha* indicates the importance of scads to the community. It shows the lengths the community is prepared to go to keep the scads in their lagoon.

In all islands the participants reported that the scads do not come in often now. If they do come it is very rarely and they do not stay long like they did before. According to Saeed, the last time he remembers scads came into Hulhudhoo was about fifteen or sixteen years ago. There are a few different views on why the fish do not come any more. Many of the elders are of the view that the fish do not come because present generations have no respect for the fish and harm them. Some believe it to be because the islands are too brightly lit now and when going out at sunset the fish gets confused as to where to go. Some fishermen say that the fish are attracted to the strong lights used for bait fishing. Shaheedha and Fazna tell of a large boat that used to be near the Royal Island Resort and how people from Dharavandhoo used to go and catch lots of fish from near this boat. They believe the lights from the boat attracts the fish and use similar reasoning for their theory on scads going away.

Another reason given for the disappearance of the scads was the decline in tuna fishing in most communities. Earlier when fishermen came back from fishing they would cut and gut the tuna on the shore and throw the waste into the lagoon. Now tuna fishermen mostly sell tuna to the collector vessels and do not bring the tuna to the island for cooking. These would be available as food for the scads. For example, Thakandhoo used to be a top fishing community but now there are no tuna fishermen in the island. These are all plausible explanations, perhaps all valid depending on their experiences and beliefs. Some use logical reasoning while others consider mystical beliefs to make sense of why the scads do not come any more. This shows that there are different ways of making sense of people's surroundings and how they interact with it. These different views cannot be captured by quantitative methods and hence, reiterates my belief that a qualitative approach is more suited for this research.

5.2.2. Community Fish

Some communities discussed with much excitement schools of mature reef fish that enter the island lagoon. Such schools usually include sea bream (*filolhu*), triggerfish (*rondu*), parrotfish (*landaa*), barracuda (*farutholhi*), mackerel (*mushimas*) and streaker (*giulhu*). These are usually one-off occurrences which may happen once or twice a year. These are schools which come to shallower water mainly by accident and would go away when tides start to rise. Like scads, the movements of these fish are unpredictable and as they stay for only a short time the communities collectively work together to catch the fish. Based on the way of catching the fish collectively, this type of fish is called "community fish" within the thesis. The communal effort in catching the fish create strong community values among members.

This discussion on community fish does not include the islands of Dharavandhoo and Kendhoo in Baa Atoll as I was not aware of this type of fishing at the time of my visit. I first became aware of this type of fishing in Maarandhoo, and thereafter I was able to inquire about it in the remainder of the communities in which I did this research. After coming from the field, I contacted members from Kendhoo and Dharavandhoo to inquire about community fish. They were able to confirm that such community fishing was carried out earlier but is not done now mainly as the fish do not come into the lagoon often. Even when it does the same level of involvement is not present among community members. This may be as many of the families now live away in the capital.

People from the northern islands, Maarandhoo, Makunudhoo and Thakandhoo gave detailed accounts of these fish being caught as a community activity and shared among the community. It seems about three hundred to six hundred reef fish may be caught from a single school of fish. Although such schools of fish do come into Hulhudhoo and Meedhoo it is not done as a community activity. According to Ahmed Shafeeu, the Katheeb of Hulhudhoo, individuals take the fish and use them.

> "If a school of [reef] fish come in, those who go to take it are the owners of it. They will deal with it. They will take and those who catch will give to whom they want. To bring, keep [it] to the office to distribute among the

> people, or to go and catch it as a community, things like that was not done here at any time."
>
> އަހްމަދު ޝަފީޤު: މަސްގަޑެއްވަދެއްޖިއްޔާ މަސްގަޑެއް ނަގަންދާމީހުން އޭގެވެރިންނަކީ.
> އެމީހުން [illegible] އަމަލުކުރާނީ. [illegible] [illegible] [illegible] [illegible] ބަހާ. އޮދީހުގަ
> ގެނެސް އޮދީހުގަ މަސް ބަހައްޓައިގެން އެ ރައްޔިތުންނަށް ހިއްސާވާގޮތަށް ބަހާދިނުމާ،
> ރައްޔިތުންގެގޮތުގަގޮސް މަސްނެގުމާ، އެކަހަލަ ކަންތައްތަކެއް މިތާކު އެއްވެސް ދުވަސްވަރެއްގަ
> ނުހިންގާ.

The communities are always prepared for these events and the preparations were also done communally. Preparation mainly included making the equipment used to catch the fish. Abdulla Adam, describing preparations in Makunudhoo said that each household will be asked to contribute two bundles of coir rope for making the net. The officials will determine a working day and call the community together to weave the nets, which takes about two months per net. The two districts in Makunudhoo island, each make their own net and people are appointed to maintain and store the nets. Ibrahim (1989) describes the work done by women in Raa Atoll in preparation for a similar kind of fishing but done further out in the atoll waters using boats. He claims this kind of communal fishing is unique in that it involves equal participation and labour by both genders.

The narratives about community fishing were accompanied with much excitement from the participants. I could sense the buzzing activity and excitement of the people and hear the hustle and bustle of people going about the different tasks assigned as if I was transformed to this place in time.[1] I felt a similar excitement reading Seedhee's (1995) account of this fishing in Makunudhoo. The first excitement comes when a person spots the school of fish coming into the lagoon. Anyone who sees a school of fish come near the island will go shouting across the island that a school of fish had come in. Today's technology such as mobile phones allow much faster communication and even allows people to go and seek such schools outside their house reef. Seedhee (1995) describe children running to announce the arrival of community fish.

---

[1] Perhaps this spur of feelings comes from remembering my own experiences with other community activities in other places and knowing the spirit and fun with which such activities are carried out.

> Child 1: "They say the fish is here!"
>
> Child 2: "They say it's in the harbour! [people] have gone to cut coconut fronds!"
>
> Child 3: "... The elders have gone too! It's like the whole sea has come in! Come quickly with the nets to the harbour!" (translated from Seedhee, 1995 p.17).

The group will continue running and giving the news to the whole island. This is a well rehearsed procedure and everyone know their cues well. Some would go to cut the coconut fronds, some would get the nets and the boats out, some would go in the boats or wade into the water and others would position themselves near the shore. Everyone, except the weak, sick or too young, had a task to do. In all three islands there was much emphasis made that this activity is very intense work and requires a lot of time and people. There are many components happening simultaneously and therefore, requires a lot of teamwork. Various forms of community fishing, involving similar collective effort, has been described by local writers (Ibrahim 1989; Seedhee 1995).

The fish catch is divided among the households and generally consumed individually by households. Shares are allocated to everyone whether they participated or not. As participants often point out it is a big task and cannot be done without involvement of the whole community. While all communities emphasised that fish was shared among all members of the community, slight variations on share allocation were reported from the communities. In Maarandhoo, Ibrahim says that those who actively take part in the days work get an extra half share. In Thakandhoo some participants said everyone gets an equal share but in recent times when participation is less, extra shares are allocated for those who worked.

Seedhee (1995) describes the fish being initially divided into four shares and then distributed accordingly. This share system is based on the level of involvement in the activity (Table 5-1). For example, there is a "wet share" for those who go into the lagoon. According to the share system described, some people would get more than one share. Any person who participated would get at least two shares; one from the participation and one from the head share. It is highly probable that everyone would have got a net share too. In a way the saying of the participants that everyone gets an equal share is correct. The extra share in Seedhee's description also is going to those who went into the lagoon.

Table 5-1. Distribution of fish shares among community as given by Seedhee (1995, p. 21)

Share Type	**Description**
1. Wet share	Distributed equally among all who went into the lagoon
2. Net share	Distributed equally among all who supplied the rope for making the net
3. Participation share	Distributed equally among all who went to take part on the day
4. Head share	Distributed equally among all men, women, child and non residents alike who are on the island that day

Note: I have used a translated term that suits the description of share types given by Seedhee in Dhivehi.

Seedhee's description may include the more detailed technicalities of earlier share allocation, which many say they have forgotten now that this type of fishing has not been practised for a long time.[2] Ibrahim Waheed, of Maarandhoo says this was last performed on the island around 1988. So the way shares were allocated in these times would have changed considerably compared to the traditional ways. In all narratives what people remembered as important about the allocations was that everyone in the community gets a share. According to Pyrad, although a foreigner, he was also given a share when he participated in community fishing activities (Gray 1888).

Although not commonly done, in later times Maarandhoo people have sometimes decided to collectively make salted reef fish and then sell it. The men will clean and get the fish ready and the women will salt and process the fish. The money obtained would be distributed among everyone who contributed to the work. Conflicts do not occur as everyone gets a benefit. As this type of work usually required the involvement of everyone a person from each household would be involved. This is also done as a fund raising activity by the island office and school for development activities. The work done is similar to the community salt fish making but the only difference is the money earned will go towards the community development activities such as building or repairing community infrastructure. I came across selling of community fish in this community only. The most important use for

---

[2] Although Seedhee's book was published in 1995, the work was written in 1943 and is based on Seedhee's experiences when he lived in Makunudhoo.

community fish is for home consumption. As people reported that the shares could be quite large, people would sometimes cook and dry the fish to be used later. This is also described by Pyrad who says that there is no selling of fish caught by the community and it is processed for long term storage (Gray 1888).

Another kind of community reef fishing is also practiced in Thakandhoo. This used to be an annual culturing and harvesting of reef fish in the mangrove area of the island. When the young larvae (*fani*) comes into the lagoon in *vihaa-nakaiy,*[3] the spawning season, the community collects this larvae and puts it into the fresh water in the mangrove. The water body sometimes, due to erosion, open to the lagoon and then the larvae can be guided in. Other times a channel is cut to do this or people transfer the larvae in buckets.

Trevally and grouper are commonly cultivated in the fresh water. When the fish has matured the community is called and they collect it together. This time large pieces of thin cloth and nets are used to catch the fish. The catch could range from three to four hundred fish. This is done during the seasons when tuna fishing is low. Abdul Raheem the Katheeb of Thakandhoo remembers this being done for a long time in the community. "This has been done in this island since I can just barely remember. People say. I can remember people saying [this was done]. It’s a routinely done thing."

> އަބްދުއް ރަހީމް: ކިރިޔާ ހަދާން ހުންނަން ފެށިއްސުރެއްވެސް މިރަށުގަ ކުރަމުން އަންނަކަމެއް.
> މީހުން ބުނޭ. ބުންޏޭ ބުނަން އަހަންވެސް ހަދާންހުރޭ. އެހެން ހަމަ ޤަވާއިދުން ކުރަމުން
> އައިކަމެއް.

As with fish caught with *fanrodhu*, this is also divided among all the people on a per head basis. Any extra ones after dividing is given to those who worked. Abdul Raheem said that this is not done anymore but an attempt was made quite recently, late 2007 or early 2008. As only some people come to do the work now the fish is divided among the people who come and do the work.

All islands reported that community fishing is not carried out at a similar scale now. Schools of fish still come in but there is not enough interest from the people. Ibrahim from

---

[3] *Vihaa-nakaiy* is a season in the local nakaiy calendar based on the seasonal division of stars. Fishing, agriculture and important festivities are related to this calendar.

Maarandhoo says the main reason is that with the population of the community being large now the individual return is very small compared to the intense task. He adds that the same community spirit is also not there. In all communities it is left as an open situation where anyone who wishes to can work together and take the fish. Abdulla from Makunudhoo said that some people now keep their own nets. From accounts from different community members I understood it is still a cause of excitement and those who are able to would still participate but it just is not like earlier times. A friend of mine was recently in an island in the north when community members thought a school of fish was nearby. She described the community as buzzing with excitement with many people, including women and children going on boats to the spot. Some women even ground the spices for cooking the fish. In contrast to the changes people acknowledged in Maarandhoo and Makunudhoo, in this case, the arrival of community fish is still a cause for great excitement.

5.3. Management Institutions for Use of Fish

Both scads and community fish are considered a common pool resource available for all members of the community. Since traditional times, everyday norms that is understood and accepted by community members had governed the use of these resources. In addition the communities have developed local rules, which are the acceptable behaviours for use, through community discussions. Often these locally developed rules varied among the communities. Unlike the use of sand and coral, there are almost no state rules for the use of fish in the lagoon. This lack of state rules may be due to the mobility, and hence the unpredictability of the movement of scads. They are not a resource that is in all islands and do not stay in the same island constantly. The discussions in this section will focus on these norms and local rules for the use of fish in the island lagoon.

Many uses and rules engaged in the use of the resource have changed over time. This being mainly dependent on the availability of the resource. Due to their mobility, marine resources such as fish are "more unpredictable in time and space than terrestrial prey" (Pollnac and Johnson 2005, p.36). The discussion of norms and rules in this section is mainly based on when scads and community fish came more frequently to the island lagoons. The changes to these management institutions will also be included in the discussion.

5.3.1. Norms for the Use of Fish

Questions on how fish in the lagoon, such as scads, were used and what rules people use in their management was always met with replies that there are no rules for using these resources. The continued use of resources without cause for much conflict indicates that there are certain practises and behaviours of resource users that avoid a tragedy of the commons as described by Hardin (1968). As an outsider to everyday community life I was more aware of these norms than the community members who are oblivious of these practises. The following are some of these norms that I believe contribute to the management of these resources by the communities.

5.3.1.1 Resource Boundaries and Conflicts

One of the commonly understood norms is that any resource inside the house reef of an island will be used by its residents only. This view is accepted and expressed very strongly by all communities. Even people from Maarandhoo and Thakandhoo, communities with a big feud over the use of scads, accept that the resources within the boundaries of the house reef are for the local residents.[4] Easa, an elderly fisherman from Maarandhoo explained that they would catch bait outside the house reef of neighbouring Thakandhoo. According to Easa, as long as they do not go inside the house reef of Thakandhoo it is acceptable and people from Thakandhoo will not oppose this. This was confirmed by participants from Thakandhoo also. The house reefs in this case provide the communities with a natural boundary marking the territory of the community. The identification of clear boundaries has always been a main problem in the management of mobile marine resources (Pollnac and Johnson 2005). Like the house reef, well identified boundaries make it easy for communities to manage the use of resources and exclude outsiders (Baland and Platteau 1996; Agrawal 2001).

Since traditional times, local communities have regulated the use of resources within their house reef and they exercise the right to exclude outsiders from using the resources. Rights to access and withdraw scads and community fish come through lineage and belonging to the island. An outsider can gain access and use rights through personal links or

---

[4] I had later found this norm to be a formalized state rule under the 1993 General Fisheries Regulation. The communities distinctly refer to this as a commonly understood norm and did not mention the state rule.

long-term residence in the community. This may be the case when an outsider, male or female, marries into a family of the island or by employment for specialised jobs such as teachers and doctors. Access by short-term visitors are also quite flexible as the person would have gained entry through kinship or friendship with members of the community. In the case of my visits, I had got introduced to the community through family or friends. As a visitor, I was invited by community members to take part in activities such as catching reef fish from the lagoon and also collecting sea food from the house reef. Research on common pool resources has many examples of outsiders gaining access to local resource through similar personal links (Baland and Platteau 1996).

Many such informal property rights regimes operate with a common understanding and adherence to traditions among communities. Examples of such systems include the Maine lobster fishery and the traditional management systems of Japanese fishing villages. (Ruddle 1987; Acheson and Gardner 2005). Similarly, in the Maldives, as all communities accepted these customary property rights, there are very few incidents of people actually going and fishing in the lagoon belonging to another island community. In spite of this, the use of scads is often a cause of conflict between islands which are very close by.[5] As community fish come in quite suddenly into the lagoon and does not stay for long such conflicts are not reported for community fish.

With the strong understanding of exclusion rights people of one island would not go to another island to catch scads. The conflicts over scads reported in Thakandhoo, Maarandhoo and Dharavandhoo occur when one community tries to lure the fish away from the lagoon of the other community. Hence, it becomes a case of if we cannot go to the fish then we will bring the fish to us. The mobility of scads makes it possible for the community to do this and still not break any informal rules. People do not see the luring of scads as breaking norms or rules. This is their way of working within the loopholes of the unwritten rules and understandings. As Pollnac and Johnson (2005) point out, the mobility of fish across boundaries is a factor which complicates the management of marine resources. As seen in Chapter 4, there are no such conflicts over the use of sand or coral which are a stationary resources.

---

[5] The discussions of these conflicts are based on accounts from the islands, Thakandhoo, Draravandhoo and Maarandhoo, that I visited. Each community talks of their being in the right and so it is not possible to say who started the conflict and when. So the accounts I am writing are in no way meant to be judging who is right.

Many people, especially elders believe that *fanditha*, black magic, is used to lure the fish. Those who do not believe in *fanditha* give alternative reasons such as lighting bright fires on the beach to attract the fish, going by boat and shining bright lights or even polluting the lagoon of the other island. These evidently lead to back and forth attempts at luring the fish and unavoidable conflicts between the communities. At most these are verbal exchanges with very few acts of violence happening. In Thakandhoo and Maarandhoo, the conflicts had escalated to low levels of violence, such as throwing stones, between youngsters from both islands. But now, with the fish more permanently gone, there is no conflict over the scads.

Such conflicts only occur when islands are very close together as in the case of Dharavandhoo and the neighbouring island of Dhonfanu which is about three and a half kilometres away.[6] Thakandhoo and Maarandhoo which are about one and a half kilometres away is another example of long standing feuds over the use of scads. Geographic proximity is a consistent condition for conflicts as it provides the opportunity for conflicts through increased interactions between members (Vasquez 1995; Robst, Polachek et al. 2007). Rasheed, from Dharavandhoo, also point to this when he says that due to the islands being physically separated by oceans the conflicts are not ongoing. Arguments usually occur when people from one island visit the other or close to an incident occurring. They are never a part of everyday life. In addition to the physical separateness of communities, people of nearby islands are often related by blood or marriage. Kinship is a very important factor in the social organization of small communities. Kinship ties are important in the use of dispute resolution and the management of conflict (Murchison 2010). Examples of this include the kinship networks that support conflict resolution mechanisms in Oromo, Ethiopia (Edossa, Awulachew, Namara et al. 2007).

According to Acheson and Gardner (2004) territories are often motivated when the benefit of excluding others outweigh costs of exclusion. It is obvious from earlier discussions that the communities enjoy many benefits, such as for food and leisure, when the scads are in and exclusion of outsiders is possible with little or no costs due to the presence of the natural house reef as a barrier. My discussions with community members and my own observations impart the idea that these benefit-costs do not seem to be the primary motivation for the

---

[6] The distances were found using island coordinates from Wikipedia and then converting it to distances using an online conversion software.

exclusion of outsiders. There is lots of emotion attached, especially by elders, to discussion on scads. Many people remember the days when scads were there with great fondness. At the same time there is much anger and bitterness towards people of the neighbouring island over the feud over scads.

Baland and Platteau (1996, p,192) assert that in communities where resources are abundant access restrictions to outsiders are often symbolic of a link that "imparts a specific identity and emotional feeling to the residents" (Baland and Platteau 1996, p.192). Discussing marine boundaries and the use of coastal resources in the Torres Strait, Schug (1996) states that traditionally, a common sea space shared by a particular community imparted the social identity and unity of the community. For Thakandhoo people the presence of scads for years seem to have become part of the community's identity. In some ways this is true as I had come across people from other communities who still associate Thakandhoo with plentiful scads.

5.3.1.2 Fish is not Sold but Shared

It is a commonly accepted norm that scads and community fish are used as food by the communities. The community members consider this to be the most important use of these resources. As a norm scads or community fish are not sold within or outside the community. Sometimes cooked scads are given as gifts to relatives or friends in other islands. Historic accounts on the use of community fish by Pyrad relates that "[a]ll this fish is used for their food in banquets and treats, there being no traffic in this kind" (Gray 1888, p.194). Traditionally, selling any kind of fish, even tuna the most economically depended resource, within communities is unheard of. It is always shared or given to relatives, neighbours and friends. Easa, an elder and retired fishermen explains that "Tuna[7] is not sold [in the community]. Tuna is sold to Malé. In the island we might sell to the *kaaduge*[8]. That is when food is scarce. Otherwise won't sell."

---

[7] Mas is the general term for fish in the local language. Mas is often used when talking of tuna as in this case.

[8] *Kaaduge* is a community food storage for staples like rice, flour and sugar that was used earlier. In times of food shortage the fishermen of the community will exchange fish for food items. According to some communities supplies to the *kaaduge* are bought with a weekly community fish share, *kaadu-mas* (literally staple fish), taken from fishermen. This share is cooked and processed and the products are sold to either the capital or Ceylon in the south in exchange for essential staples.

އީސާ: ވަރަށް ނުވިއްކާނެ. މަސް ވިއްކާނެ މާލެ. ދެން ރަށުގަވިއްޔާ ކާޑުގައިން ވިއްކަފާނެ.
އެއްކަލަ ކާއްޗަކީ ނުލިބޭނެ. އެހެންނޫނިއްޔާ ނުވިއްކާނެ.

As mentioned by Easa people have sold fish in special situations. This is also true for scads and community fish. According to the communities the selling of scads and community fish occurred in recent times when exchanges using money had become more common. Of the communities visited, Thakandhoo was the only island where *rihaakuru*, made from scads, was sold to outsiders. The selling of *rihaakuru* is linked with the plentiful and continuous supply of scads in the island. *Rihaakuru* is not made intentionally for selling but is a by-product of cooking the scads for long-term preservation. The *rihaakuru* which is sold is that in excess to the use of the community. This is another norm in the communities that resources should not be used wastefully.

With regards to community fish, the community of Maarandhoo was the only one where selling of salted reef fish was done. The main reason for selling the preserved community fish again is when there is a large catch, in excess to what can be used by a household. In these cases people join together and collectively prepare the fish for selling. Again such selling is also done for raising funds for community activities. I believe in this case it is the availability of a market that creates this exchange value. Perhaps it is a lack of such an opportunity to gain monetary benefit that traditionally community fish was not sold.

Despite the available markets for selling fish, in most communities prominence is given to communal sharing and consumption by households for food. The collective effort in catching community fish leads to the unwritten rule of sharing. Similar norms of sharing exist in foraging communities where food is gathered collectively (Sosis, Feldstein et al. 1998; Hill 2002). Many participants relate that if a person catches some scads or reef fish from the lagoon, they would often give some to the neighbours. If a household does not have an able person[9] to go and catch scads, a neighbour or family member would bring some when they go to catch fish. Mahmoodha, a woman who often catches fish from the lagoon, says that people would often ask her for a fish when she is coming home and that if there is lots of fish she would give to neighbours and friends even without them asking. "When I bring a big catch I give to people, isn't it. I give to this house too. The house in front too [I] give. Regularly."

---

[9] This may be due to sickness or being temporarily away from the island.

މަހްމޫދާ: ގިނައިން ބާނައިންގެނެސް މިހުންނަން ދީދޯ. އަހަރެން މިހިރަ ގެއަށްވެސް ދެން.
ކުރިމަތީ އެހެރަގެއަށްވެސް ހަމަ ދެން ގަވައިދުންމަސް.

Fish has always been given. Even when the introduction of market exchanges in the communities, this form of community exchange continues to operate on a sphere of its own. This is considered a gift which need not be reciprocated, although it often is with gratitude. But at other times it also gets paid forward. For Mahmoodha, her neighbours and others of the island are people she has many personal interactions with and depends on. For example, when she had to go to the capital for medical purposes, it was her neighbours who brought food for her children and kept an eye on them and the house. Similarly, another family that was away had their courtyard and road swept daily by their neighbour. Some acts, like the sweeping, are done without even asking for it. It is simply a view or norm understood that the other will do the same for you. Many similar reciprocal exchanges occur in small communities.

Gombay (2009) discuss the strong belief held by Inuit communities on sharing of country foods. Sharing is encouraged in Inuit communities with the understanding that ideally this would get reciprocated (Gombay 2009). A similar underlying view can be seen by the behaviour of sharing in Maldivian communities. Although sharing can be seen as a future insurance policy it has become such an everyday norm that people tend to forget the underlying expectation of reciprocity. Many respond to my queries of sharing saying there is no particular reason for this giving, this is how things have been. In small communities where most are related by kin or by marriage, it is again a given for members to care for one another. Some, like Nafeesa, a woman in her late sixties from Dharavandhoo, respond with rational explanations that sharing of fish is a way for communities to take care of one another and insuring that others will help when you are in need. "Now if you are helping me I will also help [you]. If you are giving me [food] I will also give [food]. Isn't that how it would be? No one will pour water into a bottomless vessel[10], isn't it?"

ނަފީސާ: މިހާރު ކަލޭވެސް މަށަށް އެހީ ވަނިއްޔާ އަހަރެންވެސް އެހީވާނެ. ކަލޭވެސް
އެތިކޮޅުފޯރަނިއްޔާ މަވެސް ފޮނުވާނެ. އެގޮތަށް. އެހެންނުވާނީ. ފޫނެއްފަޅަކަށް އެކަކުވެސް
ފެނެއްނުފުރާނެއެއްނު.

---

[10] A Maldivian proverb to express doing a fruitless task.

Such social exchanges based on reciprocity and personal relations have been described as a "gift economy" by economic anthropologists (Mauss 1966[1923]; Sahlins 1972). Mauss (1966[1923]) views these exchanges as social contracts where the act of giving creates a social bond on the part of the receiver to reciprocate the gift; the gift being any good or service that is given. Through my discussions with participants and observations in the communities I find that every giving does not necessarily imply indebtedness and reciprocation as suggested by Mauss. Many exchanges are as Malinoswki (1960, p.135) says "giving for the sake of giving" and intended to create social ties. Traditionally it is common for family members, neighbours and friends to bring gifts of food during circumcision celebrations. The *mauloodh* festival is another example of such exchanges which improve social relations and extends beyond the boundaries of the community. Although many of these gifts get reciprocated in some undefined time, it is not through indebtedness. The narration, by participants, of the festivities associated with the above examples shows that the giver receives as much joy through the festivities and friendships it creates.

The concept of obligations and reciprocity is though, not new in Maldivian societies. It is present in everyday social and family relations. This circulation and exchange of gifts in traditional communities is a common practice and is often captured in orally narrated stories. These stories have examples of exchanges, sometimes between humans and sometimes between human and the spirit world or even animals. For example, the popular children's tale of Anga-gadha Mithuru (Talkative Friend) and Anga-madu Mithuru (Quiet Friend) tells of how Santhi Mariyambu, a sprit person who carries a bag of teeth, gifts them with new, clean teeth when they sleep without brushing their teeth. The story also gives some lessons on the etiquette of gift receiving when Anga-gadha Mithuru asks for gold teeth and Santhi Mariyambu in her surprise at finding him awake dumps the bag of teeth in his mouth and runs away. Another story that captures the role of exchange and reciprocity in the communities is *Maakanaa kaloa vaahaka* (the story of the crane). The story also tells of community life and the dependence communities have upon each other and the surroundings (Saeed 2003). The story as narrated by Saeed (2003) is included in Appendix 7.

These reciprocal exchanges that occur in the communities have no finite time bound to them and it does not matter if the same good or service does not get reciprocated. Such exchanges fit more with Sahlins's (1972) system of generalised reciprocity where the giving is that of a pure gift which may involve the return of an assistance, in some non-bound timeframe, if needed. This type of exchange according to Sahlins is among close family members and this is fitting for island communities where almost everyone is related by kin or marriage.[11] The communities also engage in balanced reciprocity, described by Sahlins, but with those outside their community. Participants describe exchanging tuna for essential needs in the capital or Ceylon. Seedhee (1995) gives an account of Makunudhoo people exchanging tuna with a trader from outside the community.

Perhaps in the application to Maldivian societies it is best to separate the idea of a "gift" and "reciprocity" as done by Gudeman (2001). A gift as one which is given for the sake and its purpose more to build social relations than the expectation of another in return. This brings to mind the narration by Hawwa, an elderly woman from Thakandhoo, of giving a gift to visitors by the host families during the *mauloodh* festival. Hawwa says it could be anything, a bar of soap, a piece of cloth. Hawwa explained that this was the way things were done and there was no expectation of gifts in return. Each household has to prepare a gift for a visiting family. Reciprocity on the other hand, involves those goods and services given with the understanding of unbound repayment. As many from the communities point out everyone will be ready to help another when they are in need, whether they are in need to collect sand and coral for building a house, a bowl of rice or even in need of minding the children for a while. There are no tabs as to who owes what and the exchange is never measured in absolute terms.

Many participants, especially elders who had lived through the non-market economies, express views that the introduction of money has deteriorated the social relations which has been bound together by sharing and caring among the community members. There are many similar examples on the impacts of money on traditional communities and how people adapt to the new markets (Johannes 1978; Cheal 1988; Gombay 2010). Nizar tells that even when there was no money people had everything they needed. Fish from the sea and fruits and vegetables from the land was available.

> "If this house gets tuna all houses gets. There was no money [involved]. [It was] very easy. No headaches. We find fish, people were much better then.

---

[11] I was invited to a family night fishing trip by a friend, Rahma, whom I met during my fieldwork. It was a trip arranged by the in-laws of her sister. On the trip I tried to figure out how the over thirty people on the boat were related to each other, I soon lost count of the relations and concluded that everyone except me was somehow related.

> Toddy, banana, screwpine, we get these things. Money causes anger ... close friendships, family ties are distanced."
>
> ނިޒާމު: މީގެ މަސް ލިބިއްޖެއްޔާ ހުރިހާ ގެއަކަށް ލިބޭނެ. ފައިސާ ނުލިބޭ. ވަރަށް ފަސޭހަ.
> އެއްވެސް ބޮޑަކަށް އުދަގޫވެއްނޫން. މަސް ހޯދައިގެން. މީހުން ގާތަގައު. ކާބަދަވެސް މިބާވަތުގެ
> އެއްޗިހި ލިބޭ ހަމަ. ދޮންކެޔާ. ކަށިކެޔާ. ފައިސާ އާ ހެދި ރުޅިވެރިކަން ... އެކުވެރި ރަހުމަތްތެރި
> އާއިލާކަން ދުރުވެދަ.

Introduction of waged labour meant changes to this practice of not selling fish in the community. While those who held waged jobs were able to pay with money for tuna it also created the concept of paying for what you got and hence, distanced community members. Today people view things as obligations to be repaid measure for measure. Money can settle all accounts without any further obligations. This reminds me of the encounters and a discussion I had with a young woman, Sakeena, an account of which is given below.

Sakeena is a young woman in her early thirties. Sakeena usually lives in the capital but my visit coincided with when she was visiting her father in the island. I was frequently invited to her house for meals. Despite tuna being abundant in the island and her father being a leading fisherman, I noticed Sakeena cooked with canned tuna bought from the store. Always curious I could not resist asking about this. She explained she felt more comfortable buying the canned tuna. This puzzled me as her father went fishing everyday. Sakeena explained that usually it was her mother who cooks and dries the tuna that her father brings home but her mother was temporarily away and her father took the fish to her aunt's house where her aunt cooked it for him. Her father had said to get tuna from her aunt's for cooking and her cousin had also come and reminded her to get some tuna when she needed it. Sakeena told me she did not feel comfortable to just go and bring the tuna and she felt better to pay money and buy canned tuna from the shop at the corner. That is despite the fact that the tuna is the share that belonged to her father from his fishing efforts.

This discussion was something that became more relevant as I engaged more deeply in the different stories from the communities. Sakeena was one among many others who had similar views. There were relatives of fishermen who, despite being given fish would insist on paying as it was work their relatives do for a living. Beneath these changes of placing a monetary value on our exchanges are social ties and family relations that have become strained. The preference of Sakeena, to buy tuna from the store is evidence of this. I wondered whether it was her living in the city, where exchanges are more impersonal and market based, that has brought about such changes.

The mixed feelings felt by Sakeena is not uncommon in people living amidst parallel spheres of gift and market economies. Marcoux describe the hesitation of Mira to ask family and friends to help with moving and "preferring to pay professionals to do the job" (2009, p.671). Marcoux (2009) shows Mira's example as negative feelings of embarrassment and dependence that can emerge in an individual involved in a gift economy exchange and how such individuals might prefer the market as a means of escape. Based on my observation as in the case of Sakeena, I believe it is the availability of an alternative in the market economy that brings out these "dark sides" of the gift economy for Mira. I am not saying that reciprocal exchanges run like clockwork and are free of emotional pressures among members. These darker emotions would be like any that comes with personal relations. Does there exist any family which does not have its share of family woes? Had there not been an option for Mira to hire professionals would she consider it? If obtaining help from each other when needed was the commonly accepted norm, would Mira have these feelings of embarrassment? This brings to mind one evening during my field visits, my hostess went with me to meet a participant. Her children were asleep alone in the house but while going with me she popped her head into her neighbour's and simply said "I'm not in the house. The children are asleep." There was no need for further explanations as to what she wanted and no thoughts given to whether her neighbour might be busy and definitely no feelings of embarrassment or indebtedness. This is a norm and in turn, she would do the same for her neighbour and probably has done many times before. These exchanges may not necessarily have been in similar services.

Present day, Maldivian communities exist as a mix of gifting, reciprocal and monetary exchange. With regards to fish from the lagoon, monetary exchanges sometimes have to be made out of necessity but where such need is not present, the gift takes precedence. In contrast to the smaller communities, lagoon fish which is in excess to home consumption is now sold in the larger communities of Hulhudhoo and Meedhoo. I believe this difference is due to the larger size of the communities and the lowered level of interpersonal relationships that occur, compared with smaller communities. The lowered personal ties combined with the growing impacts of market exchanges, make it is easier to sell fish within the community.

Although fish from the lagoon is not sold in the smaller communities they still distinguish fish that is caught from the outer reefs. While fish from the lagoon is caught without much absolute costs, fish from outer reefs bear costs of fuel for transport. Therefore, when fishers come with a catch people from the community would not ask for a fish as in the case of fish from the lagoon but would ask to buy a fish. Even in this case the fishers may choose to give to friends and family or even if the fish is sold the fishers would not add costs of labour to the market price of fish. This is in contrast to Marx's beliefs that labour is the source of profit in an exchange (Avineri 1968; Gudeman 2001). This disregard for labour to be equated in the valuing further validates the precedence of the gift exchange within the community. These views on labour by the community may reflect the difference between alienated and unalienated labour.

Reef fish in this example is changing in value; its value as a gift when from the lagoon and as a commodity when caught with cost from the outer reefs. As pointed out by many scholars, in societies where gift and market economies co-exist, things continually move in and out of commodity state and people are continuously trying to make sense of the place of goods in these two spheres of exchange (Appadurai 1986; Kopytoff 1986/1998; Gombay 2009). As can be seen there are two distinct spheres of exchange operating in all communities. The gift exchanges where personal exchanges of gift and reciprocity are occurring and the commodity exchanges where the impersonal monetary exchange of goods and services can occur. Parry and Bloch (1989, p. 24) describe these on a temporal scale as "two related but separate transactional orders: on the one hand transactions concerned with the reproduction of the long-term social or cosmic order; on the other hand, a 'sphere' of short term transactions concerned with the arena of individual competition".

Although these short-term and long-tem spheres are often regarded as a dichotomy and one as the antithesis of the other[12], these distinctions seem to be less clear in today's Maldivian communities. The exchanges cross boundaries and interactions and occur across the spheres too. Traditional exchanges are getting mixed with modern commodity transactions as can be seen in the case of making gifts of preserved food described by Saeed (2003). It is ironic that this "gift" of food is now sometimes a commodity available to be purchased for a market price and gifted to another. This movement of gift foods among

---

[12] See Gregory (1982), Parry (1986) and Trias i Valls (1999) for discussions on this.

spheres of exchange is an example of how the communities have adopted and adapted to the market economy. Kopytoff (1986/1998) discusses examples of similar movements in terms of changing between commoditization and singularization. Thus, the process of commoditization cannot be regarded as an all-or-none state (Kopytoff 1986/1998; Gombay 2009). Gombay (2009, p. 122) illustrates this ambiguous nature in the discussion of the Inuit Hunter Support Program where country foods take the form of "part-gift and part commodity".

In explaining how people make sense of these exchanges in their daily lives, Gombay (2010, p.157) states that "[i]n societies that place a premium on [gift and] reciprocity, short-term, individualistic transactions are morally acceptable as long as they do not threaten the long-term cycles of exchange that focus on the collectivity". As can be seen in the communities, those exchanges and interactions which contribute to long-term relations continue to be practised. The fishermen, who sell tuna in the community, often sell for a lower price to his relatives and friends and would also give a few extra fish. The boat owner will give his boat to bring sand but the cost of fuel has to be borne. It is a delicate balancing act between the gift and the commodity.

5.3.1.3 Resources are a *Rizq* from Allah

The traditional ways of living and belief of the community give further insight into these norms and behaviours towards resource use. Islamic principles and beliefs play an important part in the everyday life of Maldivian communities. Scholars describe Islam as a way of life and it does "not differentiate between the sacred and the secular and neither does it place a distinction between the world of mankind and the world of nature" (Khalid 2002, p.332). In the Muslim way of life, *rizq* is a very important concept or belief in the use of natural resources. *Rizq* is not a word that could be easily translated as it is a complex concept. *Rizq* can be loosely translated to mean sustenance or provision. *Rizq* is all that Allah has granted for His creations to benefit from and includes all aspects, both spiritual and bodily, of a person's subsistence. In addition to material wealth *rizq* also includes knowledge, faith, health, good character, family and off-spring among other forms of sustenance.

As most religious concepts have their own cultural adaptations, so does the use of *rizq* in Maldivian communities. In the Maldives, *rizq* is more widely used to include the non-spiritual forms of sustenance and the plentiful marine resources often get referred to as a *rizq* by the people. This view of marine resources as a *rizq* stems from the belief that all things are created by Allah and belong to Allah. According to Khalid (2002), this belief of Allah as the sole owner of the earth and everything in it is among the guiding principles for environmental law in Islam. As coming from Allah, *Rizq* is plentiful and without any limits. These beliefs are in contrast to some modern economic assumptions that man's wants are unlimited and the means to fulfil them are limited. Elders such as Anwar would often state that "[We] use as we get [it]. It is a rizq given by God. You cannot use it up. Cannot. If so the fish we catch from the oceans should get depleted."

އަންވަރު: ހަމަ ލިބޭވަރަކުން ބޭނުންކުރަނީ. އެއީ މާތް ކަލާނގެ ދެއްވާ ރިޒްގެއް ވިއްތަ.
އެއެއް ހުހެއް ނުކުރެވޭނެއެއްނު. އެނުވާނެ. އެހެންވިއްޔާ ކަނޑުން ބާނާ މަސްވެސް
ހުސްވާނެއެއްނު.

An important belief of the resources as *rizq* is that these resources are not for the use of one person. These resources are there for everyone to use. Part of the belief in *rizq* is that an individual's allocated *rizq* has been already determined before his creation. The amount and the right time for receiving *rizq* is also predetermined. Therefore, each individual must be content with that which he or she gets. This is pointed out by Riyaz, a fisherman in his thirties, from Dharavandhoo, that there are no conflicts when one person catches more fish than another. Manik adds to this that there are those who will catch more and those who will catch less. This is something everyone accepts. Often those who catch more will give to others after taking what they need. Despite this concept of having one's *rizq* predetermined, Islam has obliged every individual to seek his *rizq* in a lawful (halal) manner. Seeking worldly gains is also considered a divine and religious matter in Islam. Many elders from the communities pointed out to me that catching fish for a livelihood is considered a religious obligation similar to praying and fasting.

It is a common belief that it is not permissible for a person to take from the *rizq* of another. Many elder fishermen believe that Allah will continue to give *rizq* as long as people are respectful towards others using it and not take unjustly from another's *rizq*. Therefore, such beliefs of accepting each individual's *rizq* leads to consideration of others needs and lowered competition among users. This is contrary to the earlier seminal works of Gordon (1954) and Scott (1955) that resource users would only consider their own gain and would not take into account the impact of their actions on other users.[13] Gordon's belief (1954, p.135) that anyone who waits "for its proper time of use will only find that it has been taken by another" would be alien to the local beliefs as an individual's *rizq* is pre-appointed. I acknowledge that Gordon's (1952) and Scott's (1955) theories were developed for common pool resources which had more economic value and in contrast fish from the lagoon is given more importance as subsistence by Maldivian communities. Nevertheless, I found that the beliefs in *rizq* and acceptance that each individual will be able to get different amounts of a resource extend beyond this subsistence use. Behaviours, consideration and this acceptance are common in the main economic activity, tuna fishery too. Examples can be seen in catching of bait and first comer rights to a school of tuna and even sharing of information on where fishing is good. Unfortunately, with the slow eroding of religious values these kinds of behaviour and norms are fading away.

5.3.1.4 Scads are Sentient Beings

Many elders are of the view that the scads are creatures just like us humans. They have been created by God just like us humans. The scads would be conscious and understanding of our behaviours towards them. Therefore, they have to be treated with respect and make sure no unnecessary harm is done to them. Elders say that earlier people caught fish in ways that did not harm the fish. Mufeed (a man in his early forties) and Idrees (a man in his late seventies) from Kendhoo express strong emotions over the harming of scads. Just like us the fish would also feel the pain when it is harmed.

> "The younger generation [harms the scads]. Earlier [people] will not do something like that. … If it is getting beaten it will not come there."
>
> "They will know to some extent. [They] will not come to where [they] are being disturbed."

> މުޙައްމަދު، އިދްރީސް: އާ ޖީލު ގެ ކުދިން. އިރަކު ނުކުރޭނު އެކަހަލަ ކަމެއް ކުރާކަށް.
> އެނގޭނު ވަސްވަރު ... [illegible]
> [illegible]

---

[13] Later work by scholars of common pool resources critique these views as not taking into account the ability of appropriators to find ways to communicate among themselves. See works from Baland and Platteau (1996) and Ostrom (2006) for discussion on self-organization of communities.

އިދްރީސް: ކޮންމެސް ވަރަކަށް ހާއްޗިރިވެސް ދެނެގަންނާނެއެއްނު. އުނދަގޫކުރާލާކަށް
ނުވަންނާނެ އެއްނު.

Communities who view this inter-relatedness between humans and animals would not needlessly harm the animals. They cannot justify taking more than needed for such taking always involves a sacrifice on the part of the animal. These values are deeply rooted in traditional Maldivian communities and is linked to their religious beliefs. For example, any unnecessary pain even to a sparrow, let alone anything greater is a sin for which the offender will be questioned by God on the Day of Judgement (Haq 2003). The accountability of humans for their actions towards the surrounding environment is rooted in the Quranic doctrine that humans were placed on earth as vice-regents and thus has the role of trustee and custodians of the earth (Khalid 2002; Faruqi 2007).

Many traditional hunter societies also tend to view nature in ways where the human-animal relationship is seen in a spiritual manner and creatures are associated with personhood (Berkes 1998; Gombay 2010; Helander-Renvall 2010). Hallowell (2002) coined the term "other-than-human persons" in describing those entities which are ascribed person characteristics by many non-globalised cultures. Hallowell describes that the Ojibwa people interact with all persons, including the other-than-human, through the principle of mutual obligation. As such when hunting animals, humans are expected to treat the animals in the proper manner. Berkes (1998) describe a similar relation between Chisasibi hunters and their prey. Oral traditions of the Chisasibi hunters tell of the disappearance of caribou for years from the Chisasibi Cree area due to hunters shooting them wildly without respect and killing more than needed (Berkes 1998). The elders of the community predicted that they would return. "The caribou would return one day, but the hunters had to take good care of them if the caribou were to stay" (Berkes 1998, p.107). When the caribou did return the hunters were able to keep them by listening to the elders. It took a similar mishap, where the behaviour of hunters reduced the number of caribou which returned, for the hunters to believe in the stories of the elders.

Similarly, native people of the Northwest Coast of North America believed fish to be sentient beings (Losey 2010). They believed salmon if treated improperly could refuse to return to be caught by humans. The intentional dismantling of durable fishing structures practised after the fishing season, described by Losey (2010), was among such measures to ensure proper treatment and return of the fish. This dismantling ensured that the fish did not get trapped in them when there were no humans to use the fish. The work by Losey (2010) is among a few examples where personhood is extended to fish (Langdon 2006). Most related literature focuses on land animals. A reason for this may be that compared to land animals fish and their behavioural patterns are less easily visible.

Literature on this human-animal sociality describes reciprocal relationships where the animal or fish gifts itself to the hunter or fisherman (Nadasdy 2007; Losey 2010). The accepting of such gifts indebts the humans to certain practises and rituals. Such practises include food taboos, ritual feasts, respectful ways of hunting and disposing of animal remains among others (Nadasdy 2007). Although elders of Maldivian communities view fish to be sentient beings endowed with emotions, the idea of the fish gifting themselves to the fishermen are not part of this worldview. This made sense in light of the Islamic beliefs of the community such as all that is in the heavens and the earth belong to God and it is by God's will that all things happen. Therefore, thinking of the fish as such beings would be part of the respect for the fish, and showing respect for God.

After trying to make sense of these views I could not help but wonder if the earlier pre-Islamic generations of Maldivians had such a view of human-animal sociality as described in the literature. Had these views been replaced by later Islamic views? Thinking further about this I remembered the story of how the skipjack tuna came into being, that I had heard during my visit to the communities (Appendix 8). It was mostly the elders who knew this story and even they could only remember bits of it.

In the story the skipjack tuna is fashioned out of dough by a princess[14] and it comes to life as she lets it go into the sea. She sends it away to go and dwell in the sea and multiply in numbers and she asks the fish to let her people catch some of its children for food. This request is granted by the tuna on certain conditions that the people should fulfil. These are mostly conditions on the gear to be used, such as the pole and line, for catching the tuna. This is an almost forgotten story but could it be support for the existence of a belief in a relationship of reciprocal exchange between humans and the tuna? As Nadasdy (2007) points out, whether to treat this as a metaphorical construct or as valid depends on the worldview of

---

[14] The different versions varied on who the young girl was, but a commonality is she was a young girl of noble status.

the individual. What is interesting for me in relation to this story is that even today tuna is caught by this traditional pole and line method described in the story. I had wondered about why in this advanced age of technology and markets, fishermen continue to use this traditional methods. I posed this question to many fishermen and the answer was always that this was the way their forefathers fished. This is how it has always been done.

5.3.2 Rules for the Use of Fish

As mentioned earlier, the use of fish in the lagoon is mainly managed by the local communities. There were few, almost no, state rules for the management of fish in the lagoons. The only one mentioned by the communities was the prohibition of using nets for catching the scads. Even in this there were disagreements as to whether it was a local or state rule. Many of the participants believed this also to be a local rule. According to the participants, this rule has been there for a long time, as far back as even the elders could remember. On inquiring further into this issue from state authorities I found that the ban on use of nets for fish in the lagoon is a state rule but the origin of the rule itself is from traditions and practices of the communities (pers. comm. with Assistant Prosecutor General A.H. Fahmee on 21 September 2011). According to Fahmee, the practice was formalised as a state rule in response to requests by the communities. I believe the lack of state rules is due to the mobility of fish. It cannot be predicted if fish such as scads or community fish would be in all islands and at all times.

In terms of local rules, I found that such rules are virtually non-existent for lagoon fish and community fish. According to participants the low level of lagoon fish use is a reason why there are no local rules for its use. This is similar reasoning to why local rules did not exist for traditional use of sand and coral. I believe that in the case of community fish that a combination of factors, the mobility of the fish and short duration, is the reason for the lack of rules. This causes the fish to be hunted opportunistically. Hence rules on restrictions of gear or timing does not apply. The only unwritten rules being to cooperate fully in catching the fish and in turn dividing the catch in a fair manner among the community. The lack of rules is not from a lack of importance but as these are one time interactions where the well known procedures and norms are sufficient in the management.

In contrast to lagoon fish and community fish, there are many local rules developed for the use of scads. Scads are a resource continuously used by all members of the community. According to all communities, a main objective in the use of scads is to ensure they stay in the lagoon for a long time. This needs careful use of the resources in a manner that the scads do not go away. The need to ensure the continued stay of scads is the main reason for the many local rules for their use. This view is captured by Mohamed Naseer, the Kuda Katheeb of Dharavandhoo in his statement that "it is the people of our island, we, who will eat from it. If [the scads] leave tomorrow, we will be the ones at a loss. If it remains the benefits will also come to us."

މުހައްމަދު ނަސީރު: އަހަރުމެން ރަށުގެ މީހުން އަހަރުމެންނޯ ކާންލިބީވެސް. މާދަން
ނިކުމެގެން ދިޔައިމަ ދެރަވާނީވެސް އަހަރުމެންނޯ. އޮތިއްޔާ މޮޅުވާނީވެސް އަހަރުމެންނަށް.

The local rules developed are centred on controlling access to the resource and the type of equipment used. Most participants say these rules have been there for as long as they remember and they have been there for generations. These local rules varied slightly among communities but the objective, of ensuring the stay of scads, remained constant. Table 5-2, at the end of the section gives a summary of the local rules in different communities. Details of how such local rules are formed is provided in the background to local governance presented in Chapter 1.

All participants described the local rules as being initiated by the community, often when an issue arises. Concerned individuals, mainly elders and fishermen, from the community bring it to the attention of the island leaders. Manik stated that those who interact with the resources more would have a deeper knowledge of their behaviours. Therefore, they will know what kinds of practices would ensure the scads are not harmed.

> “A person who goes fishing will know that fish will not bite at that time. Fish will not bite at that time. So it is not a good thing. That is what it is. They [fisherman] will go to the leaders and say this is not being done in a right way and close [this area] like this. At certain times like the flood tide.[15] Allow to catch fish at high tide at low tide they can’t go in. If [the fishermen] ask, then the [island] office will inform [the people]. Inform and ban.”

---

[15] The Dhivehi term used here is foo-dhiya but foodhey-dhiya is more widely used.

މަނިކު: އެ މަސްބާނަންދާ މީހަކަށް ވިއްޔާ އެގޮތް ދޯ އަގުބޮޑުގަ މަހެއް ނުގަންނާނެކަން. މަހެއް
ނުގަންނާނެކަން އަގުވީގަ. އެހެންވީމަ އެއީ ހިފަހައްޓަމުންދާ ކަމެއް. އެއީ އަދިހުނިމާން
ފިރިހެނުން އަރަން ގޮސް ބަނދަރު މީހުން އެއީ އެކަނިވެރިކަމުގައި ހިފަހައްޓަމުން. މިކަން މިގޮތަށް
ބަނދުކޮށްފައިވޭ. މިއަދުގެ ބިޔަކަން. ދެރަ ޖެހިގެންވަނީ. ބޮޑު ދިރިއުޅުމަށް މަސްބާނަން އެހެރިގޮތަށް.
ހިކިދިރިއުޅުމުގެ ނުހިފާވާކަށް. މިގޮތަށް ހަދާދަނީ ބޮޑުމަ ދުވަ އެޅުމުގެ ފައިދާތައް ދުވަހުއްކަލަމު އަންނާނީ.
އަންގައިދެން މަސްހުރިނަމަ.

Many conservation practices in traditional communities are similarly based on the local knowledge that the communities possess. According to Turner and Berkes (2006, p. 496), "traditional ecological knowledge systems are infused with practices and concepts, and modes of teaching and learning that can be related directly and indirectly to resource stewardship and conservation".

5.3.2.1 Limiting Access

One of the ways that the use of scads has been managed is to limit access to the resource. These include setting times when scads can be accessed and caught and also periodic closures. Limiting access to resources is one of the most common ways of managing the use of common pool resources (Ostrom 2006). One well known case is the traditional practice of *sasi* in Moluccan societies of Indonesia (Thorburn 2000; Harkes and Novaczek 2002). *Sasi* is a traditional system which puts spatial and temporal restrictions on the harvesting of certain natural resources (Thorburn 2000). Similar restrictions can be seen in the use of marine resources as well as other terrestrial resources (Johannes 1978; Aswani 1998; Berkes, Colding and Folke 2000, Cinner, Marnane, McClanahan et al. 2006).

In Thakandhoo periodic closures were practiced when the scads came in. According to community members people are not allowed to take the scads when they first start to come in. The community has to wait for about two to three months before they can fish. The rule was developed to allow the scads to mature and also grow in number. Years of experience with the scads show that when the scads are fished immediately more scads do not come in and the school of fish gets depleted very quickly. If the scads are allowed to mature they stay for longer. Yoosuf, a man in his thirties from Thakandhoo, gives the analogy of a plant which if used for timber when small may only be good as firewood but if left to mature you could get better use as timber or a continuous supply of food. Based on the in-depth local knowledge of the users the size of the scads is an indicator of when to start fishing. The island chief will check the size of the scads and then give the permission to start fishing once the right size has been reached.

The island of Thakandhoo is one which has reported the longest interaction with scads and hence, has more local rules in place than other communities. Once fishing is allowed there are further rules determining when people are allowed to fish and when they cannot. The reason for this is so that the scads will not get harmed. The fishermen and elders have through experience learnt that once the scads get harmed they go away and do not come back to the island. Under these rules people are banned from fishing during low tide. It is difficult to hook scads during low tide and this often results in the fish getting away injured. The community at Dharavandhoo also has similar rules on not allowing people to fish at low tide. The long-term goal, as stated by many, was to ensure the fish is there for people to use for a longer time.

5.3.2.2 Gear Restrictions

Placing restrictions on the gear allowed to catch scads played a vital role in managing their use in all communities. An important feature of gear restriction is to limit the extraction of the resource. This is aimed at ensuring scads stay for a longer time in the lagoon. This also ensures that many people can make use of the resource. In a study involving 33 fisher groups, from various countries of the world, Schlager (1994) found that the restrictions on the type of technology used was the second most employed local management rule. Such gear restriction is common in traditional management practices of Pacific island communities (Johannes 2002b).

A common rule to all islands was the ban on the use of nets. As mentioned earlier this had been formalised to a state law by request from communities. An exception, also mentioned earlier, is the use of scoop nets when the scads rush up to the shore when chased by larger trevally. According to participants this prohibition of nets was to ensure that the scads are not caught at a single go by one or few people. Thus, they are available for the whole community for a longer time. This again is in line with the view that the scads are a *rizq* for use by everyone. Almost everyone in the communities are horrified at the thought of using nets to catch scads. Nizar, an elder from Hulhudhoo exclaimed when asked about use of nets, "nets are not used. *La ilaaha!*"[16]

ނިޒާރު: ދާނުޖަހާނެ. ލާއިލާހަ.

In all islands using equipment and techniques which would harm the fish are prohibited. These include use of bare hands, spears, multiple hooks and quick sharp pulls using large sized hooks. Fishermen explained that when these things are used many times the fish is not caught but gets away injured. Soon the whole school of fish goes away. Fazna talked of how fishermen get angry if they use multiple hooks, "when we go to catch mackerel if we use hooks in a certain way they [older fishermen] get angry."

ފަޒްނާ: މި މުރިމަސް ބާނަންދާއިރުގަވެސް ވަކި ގޮތަކަށް ބުލި އެއްލައިގެންގޯސް
ގެނެސްހަދަންނާވެސް އެމީހުން ރުޅިއަންނާނެ.

Shaheedha and Fazna explained that the men get very angry and upset when youngsters throw rocks and scare away the fish. This is because the men know that the fish will not stay if rocks are thrown. The elders specially get upset if the fish get harmed. This is as they believe it is not right to harm the fish as they are also Allah's creatures. Participants from Dharavandhoo said that the person who does *fanditha* to bring in the scads now refuses to do it as people nowadays harm the fish. The person who taught him *fanditha* had asked him not to do things that harm the fish.

In all islands pole and lines were allowed to catch scads. This is preferred as in this way all the scads are not taken at one go. Instead, people can continue to use it over a long period of time. If large amounts are caught in a single attempt this does not give the fish a chance to mature and hence, the scads do not return. Yoosuf says that once fishing of scads start, people could see different sizes of scads in the lagoon. The smaller ones stay closer to the shore and the larger ones stay further out and sometimes has to be caught by going in a small *bokkuraa*, a small rowing boat. Yoosuf explains that the use of pole and lines allows some of the scads to mature. Yoosuf's explanations are from the local knowledge people

---

[16] La ilaaha literally means no God and comes from the beginning of the Muslim Shahaadhaath "there is no God except Allah". In the Maldives many people shorten this and say "la ilaaha!" as a way of exclaiming surprise or that something is unheard of.

have gained about the behaviour and growth patterns of the scads. It is this knowledge that is used in developing the rules to ensure continued use of the resources.

Table 5-2. Summary of local practices controlling the catching of scads.

Rule types	**Dharavandhoo**	**Kendhoo**	**Thakandhoo**	**Makunudhoo**	**Hulhudhoo**	**Meedhoo**
Closed periods	-	-	✓	-	-	-
Restricted access times	✓	-	✓	-	-	-
Ban use of nets	✓	✓	✓	✓	✓	✓
Ban multiple hooks and hooking	✓	✓	✓	-	-	-
Other harmful gear restrictions	✓	✓	✓	-	-	-
Use of pole and line	✓	✓	✓	✓	✓	✓

Notes: Practices as reported by participants.

5.3.3 Enforcement of Local Rules

Both island officials and community members agree that people almost always comply with these local rules. There have been very few or almost no occasions of violations. Emphasising the level of compliance Ibrahim Rasheed, the *Kuda Katheeb* of Thakandhoo said that "ever since I can remember, when the fish start coming no one will even go near the fish until the office gives permission. Not even a fishermen."

އިބްރާހީމް ރަޝީދު: އަޅުގަނޑު ހަދާން ހުންނަންފެށިއްސުރެއްވެސް މަސްގެ ވަންނަންޏާ
އޮފީހުން އަންގަންދެން ކައިރިޔަކަށް އެކަކުވެސް. އެއްވެސް މަސްބާނާމީހަކުވެސް.

Island officials from all communities reported that there were few incidents reported regarding the breaking of local rules for the use of scads or lagoon fish. Any non-compliance report is usually relating to the taking of sand. This may be because the local rules for scads have been developed by the community and therefore it is more acceptable to them. In the first instance, the rules have been formed because of the importance felt by the community to keep the scads in the island for the community to use. Therefore, the community understands the benefits to them from the compliance to these rules. Mohamed (2007) identifies the lack of information of benefits as one of the reasons why fishermen from Baa Atoll do not take initiative in complying or enforcing state rules on a local MPAs. The fishermen believe the protected area has been established for the benefit of tourists only.

Scholars on management of common pool resources agree that cooperation is better achieved when rules are developed locally among the user groups (Baland and Platteau 1996; Agrawal 2001; Ostrom 2006). Ostrom (2006, pp. 333-334) on the farmer-governed irrigation systems studied by Lam say that "farmers with long-term ownership claims, who can communicate, develop their own arrangements, establish monitors and sanction those who do not conform to their own rules, are more likely to grow more rice, distribute water equitably and keep their systems in better repairs than appropriators using government systems".

Participants from the communities explained that there may be the occasional people, mostly young children, who might throw a few stones for fun. When something is thrown into the school the fish will quickly move away and then reorganise again. Seeing such a large body of little fish move is quite enjoyable and fun for the young children who yet do not understand the importance of the fish. Such incidents do not get reported as any elder on the shore would call out to the children and explain that they should not harm the fish and it will go away. At worst the children would be scared off a little by the prospect of being taken to the island office if they continued or repeated such an action. It would be more accurate to use the term self-policing for this monitoring of local rules. Participants mention that earlier if anyone sees a person violating these rules, for example fishing at a banned time, others will call out and remind him. For more serious things like people using nets they do get reported. But all communities said this was very rare in the earlier days and the need for harsh penalties had not come. As the local rules were developed by them every member felt responsible to monitor and take appropriate action.

According to the Magistrate of Makunudhoo it is rarely that these matters go to the island office or the magistrate. He informed that penalties for local rules can be legalised under the law by treating this as a case of disobeying the leaders of the community. He added that so far there have been no such cases.

The importance of scads to the communities can be seen by the request to the government to formalise the local rules banning the use of nets to catch scads. The use of nets would cause the scads to be extracted at a faster rate and also it allowed only few members to use the resource. The communities felt that legitimizing the rule gave it more weight for enforcement. This legitimizing seems good forethought considering today's upheaval in law enforcement where everything has to be formal to be accepted. This will be discussed later in this section.

Although compliance with local rules was good in earlier times, many reported that this is not the case now. From the discussions and observations from the communities I can guess the changes in the availability of scads to be a main reason for this. This lower frequency of scads coming in to the lagoon is changing the level of interaction with the resource. For example, the people of Thakandhoo said that earlier they did not remember when the scads were not there. Whereas this was an important food source earlier the community cannot depend on it now. Therefore, the usage has changed to a less dependent resource which could be caught more for leisure than a permanent source of food. Those who provide food for the family seek more permanent sources and the youth find scads purely as a recreational activity. Many of the youth actually live in the capital, for education or employment, and return to the island only for holidays. This is a time when they are looking for enjoyment and fun. Catching scads is a pastime for them and they do not understand the importance of the scads to the elders.

The elders who had seen the harsh times of famine and have also undertaken the hard labour of daily fishing still have the same regard for the scads and the local rules made for their use. In all communities it is the elders who talked of the youth not paying heed to these local rules. Many of the women I talked to often said the youth do things just for fun. They do not actually mean to harm the scads or send it away. Many believe that this is because they are not as aware of the consequences of their actions. This is referring to the younger generation having less interaction with the resource and hence, being unaware of the problems compared to those who interact with them more. The women showed an understanding of the views of the youth as well as that of the elders and the men.

In more recent times, the local rules have been mocked by youth as not being "real". Rasheed, a man in his thirties from Dharavandhoo, sarcastically pointed out that now there is too much "awareness" among the public. He explained that everyone now knows that just because the island office informs of a rule, it cannot be enforced without a formal law. This awareness, especially regarding the constitution and the law, which Rasheed refers to is a recent trend after the political changes in the country. Overnight everyone had become experts on the constitution and the law of the country, on what is legal and what is not. Youngsters are using this increased awareness to defy local leaders and rules. In this chaos, local rules are now losing their place. Everything has to be a formal rule to be accepted by them. Sadly, this claim for legitimacy is trampling these local institutions that have existed and succeeded in managing local resources. Such impacts on local rules and their implementation, I believe, is not by design of the government or politicians. This is a result of the political rivalry and the many confrontations by political parties who use the law and constitution in their accusations and justifications.

In present day, community officials are often accused of being slack in their enforcement of local rules. This accusation mainly comes from elders who reminisce about earlier levels of compliance and enforcement in the community. From discussions and also observations in the communities, I can view this more as an issue of a change in the society. The officials are faced with a more heterogeneous community than before, in terms of their view on the resource, its use and management (Figure 5-1). Heterogeneity of interests within a community is identified as a strong barrier to form a collective action (Baland and Platteau 1996; Ostrom 2006). The elders have firm beliefs in the local rules and conservation of the resource whereas the youth think local rules are not real and others who remain more or less neutral regarding the issues. Those who fit into this neutral group generally seem to be women or mothers. This may be for two reasons. One being that women are not as involved in catching scads as the men and secondly, the youngsters who misbehave are their children and hence, they prefer not to have so strong opinions of enforcing local rules. While these observations are general changes within communities over time, some specific changes between study islands have also been observed. These are provided in the discussion of changing values in Chapter 6.

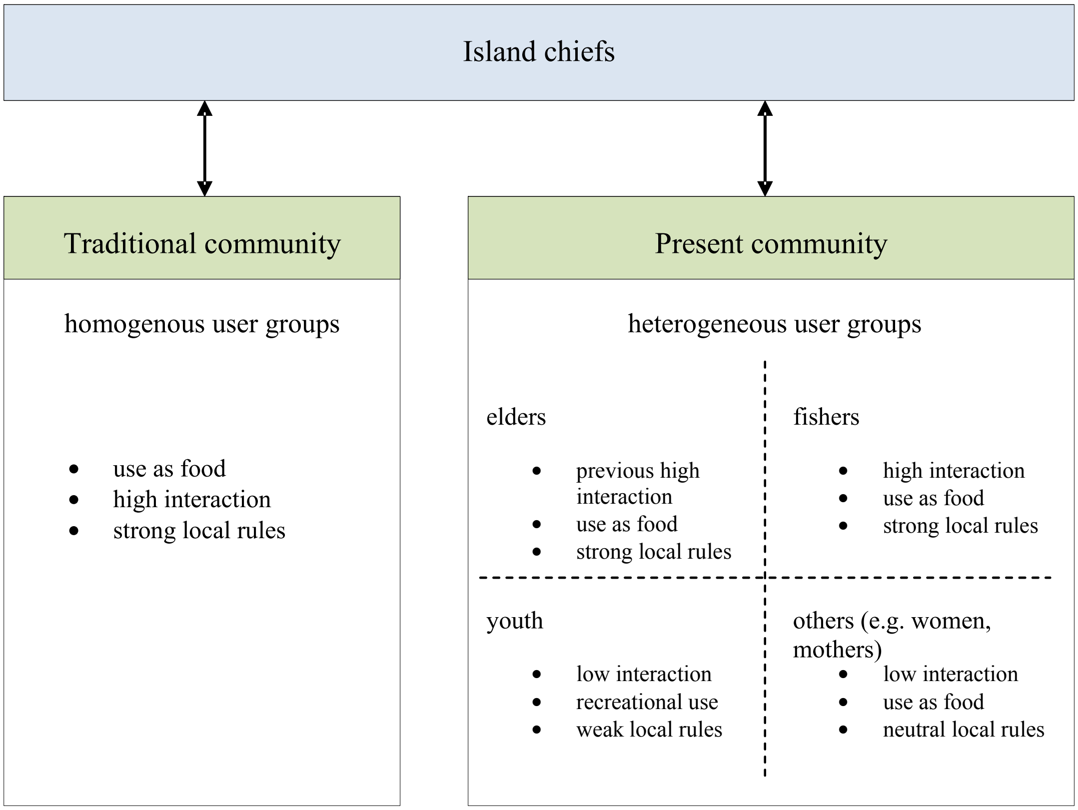


Figure 5-1. Changes in the perception of user groups towards the use and management of scads in the community.

It should be noted that the reason the local rules worked earlier was because the whole community believed in them and worked together to enforce them. Traditional resource management systems describe communities who live in close proximity and interact with their surroundings on a regular basis. Many such examples can be found in literature (Johannes 2002b; Turner and Berkes 2006; Gombay 2010). In a recent study of values people assign to their natural surroundings, Seymour et al. (2010) found that people who lived in closer proximity had a wider variety of values than those living farther away. On a similar note, if interaction between resources decreases then the importance of managing the resources will also be reduced. Geographic distance has often been identified as a cause of lowered interaction and more passive environmental values relating to resources (Brown, Reed et al. 2002). Perhaps this is the reason for the changes in the management views held by the younger generations in the Maldivian communities. Their extended stay away from the islands means changes in the amount and ways of interaction with the reef resources.

5.4. How Do Communities Value Fish in the Lagoon?

This is a question that can be answered by careful exploration and understanding of how the fish in lagoons are used and managed by the communities. According to Kennedy and Thomas (1995) resource values are expressed in the various actions humans formulate in their interaction with the resource. These include the formal and informal laws, sanction systems, nature programmes and property rights allocations. In this section, I further explore these management institutions and discuss what these relate about the value of these resources to the communities.

5.4.1 New Values for Old

Accounts of usage of fish in the island lagoon reveal that although traditionally, lagoon fish were not used much, scads and community fish were most importantly considered a food source. Scads and community fish were a fresh supply of food, the catching of which provided a recreational element too. This view was expressed by many of the elders and fishermen who used words such as *hiy-hamajehun* (content or joy to the heart), *ufaleh* (joy) and *majaa* (fun) in describing the coming of the scads and community fish to the island. Thus, the importance of these resources comes from their use value which provides the need for food and at the same time gives enjoyment.

Among the norms for their use, scads and community fish were mainly for home consumption only and they did not have a market exchange value. This lack of an exchange value is mainly because everyone in community has access to these resources and thus, there is no need to buy fish. The recognition that values are cognitive representations and transformations of human need has been well established in value literature (Rokeach 1973; Rohan 2000; Mei 2009). In addition, due to the unpredictable nature of these resources they are considered a secondary source of food, which is used when available. The communities traditionally preferred skipjack tuna as the main staple. The importance of skipjack as a food and as an exchange commodity has been well established in the communities as can be seen from historic accounts of travellers such as Ibn Batuta and Pyrad.

Any exchanges were in the form of gift exchanges, where fish is shared with neighbours, family and friends either by giving or sharing of cooked meals. Such sharing is more in line with Malinowski's (1960[1922]) thinking of a gift intended to build social ties as opposed to Mauss's (1966[1923]) view of a social contract obliging the receiver to reciprocate. This is the distinction presented by Gudeman (2001) of a community realm and market realm. In this community realm, gifts often get reciprocated or paid forward. Though these exchanges may not necessarily be of equal kinds and community members would not even view this as reciprocating a favour.

These examples show the strong community values and social ties that are created through the use and sharing of fish. Thus, such sharing annihilates the need for value equivalence as there is no expectation of an exchange of one for another of similar value.[17] How can the bowl of fish soup given by a neighbour be valued against watching over her house when she is away? The same applies in the exchange of labour. In these communal exchanges labour is never considered as a commodity that creates value. In this case of catching fish from the lagoon, the labour involved is often viewed as a recreational activity. Hence, the fisher is getting two use values.

Changes to the predominant community realm through the introduction of markets meant some changes to the norms of not selling fish from the lagoon. These changes were only observed in the use of scads in Thakandhoo and the selling of processed community fish in Maarandhoo. As discussed earlier both situations were a market created out of necessity due to the abundance of the resource. It is the norms of using without wasting that also provides an economic benefit. I would again like to stress that it is the existence of the market realm that selling is considered by the communities. Looking at the long term stay of scads in Thakandhoo and the lead up to the creation of a market commodity, I wonder if similar circumstance in other islands would have created the same new value. Would these situations have converted use values to exchange values? This seems a question left for pondering as present interactions with scads seem to be short lived as they do not stay for long even if they chance to come in.

In more recent times, fish in the lagoon are valued more for recreation than for subsistence use. Fish in the lagoon has become a resource fished as sport, especially by young children. One of the reasons for this I believe is that fish such as scads and community

---

[17] The problem of exchange and commensurability has been a well discussed topic (Kopytoff 1986/1998).

fish do not come in as frequently now. Therefore, people cannot depend on it as a reliable source of food. The lowered return periods of fish combined with the lowered interaction with the fish is perhaps the reason for this change to recreational use. In all communities, many families have migrated to the capital and they to the island for holidays only. This means that the youngsters who live away do not interact with on an everyday basis, and hence, their interaction with the reefs is recreational than for livelihood.

This recreational element in turn formed new social interactions and values within the community. Catching of fish is done in groups and these lead to social sharing of the cooked fish. The cooking further involves the mothers and other family members, thus leading to the food being shared among them too. Rahma, a young woman in her twenties from Dharavandhoo, who fishes from the lagoon for fun, stated that if there is a lot of fish caught they give to other family and friends too and sometimes they cook the fish and eat together. Overall, this has triggered a build of social interactions in the giving of fish as well as the cooking and sharing of a meal. These events are often restricted to school holidays. The changes in use of fish from the lagoon have found a place of new value within the social realm of the community.

5.4.2 Collective to Individual Values

From birth people are learning about values and to make value judgements, what things are good and what are bad or what is desirable. As their individual experiences and social interactions increase, these further shape the individual value processes. In this sense the common values of a community will influence an individual's valuing (Gruen 2002). In an interplay of relations it is the individual values that form the collective values of the community too. It is the day to day values of the individual that shape the norms and traditions of a community.

This link of individual and collective values is prominent in the use and management of fish in the lagoon by the community. For example, the catching of community fish is a unique activity where the collective preparation and smoothness of the activity indicate the high value placed on this activity. Many social interactions occur in the catching of this resource. The initial preparation of nets brings together members working for long periods for a common goal. A lot of cost in terms of time and labour is incurred by the community. As described by Ibrahim (1989), the ropes for making the nets were also made locally, by the women, from coconut fibre. If accounting in a modern economic sense, the return of benefits from fish shared would not be comparable to the cost each individual incurs. Here, again I see the difference in worldviews and its impact on how we value things. Underneath the "costs" of time and labour are many hidden social benefits in community building. Like in the case of the Ache, described by Hill (2002), all the activities that immediately relate to the hunting and food sharing fit into a larger infinite summation of daily life in the community. Thus, I believe it is foolhardy to attempt to account the costs and benefits of community fishing in a modern economic sense.

I infer the value of this resource to be much deeper than the immediate use value of the fish by individuals. The cooperation in this activity can also be related to the cooperative behaviour present in all aspects of life. For example, participants had described the building of an individual's house as something done collectively by friends, family and neighbours. From the taking of raw materials such as coral and sand, to processing of these and the completion of the house, these are all activities done by mutual cooperation among individuals or a group. Similarly, the carrying out of communal work was described as people working together with much joy and community spirit. Linked with this earlier cooperative behaviour is a strong social capital stemming from a sense of community which shares similar norms and belief or values.

Scads in the lagoon is another example of the link between individual and collective values. Although scads are caught and used individually, it is the collective interest by all members to maintain the school of scads in the island that lead to the social norms and rules. Many community members echoed this view through statements like there is a benefit to everyone if the fish stay in the lagoon. Thus, emphasising the importance of everyone working collectively. The full support by the community in monitoring and enforcing the local rules also show this collective regard for the maintenance of the resource. Every member of the community valued the resource and felt the responsibility to teach these values to the younger generation. If a group of children happens playfully to throw stones at the scads, each member of the community feels it a responsibility to intercede and tell them not to do so and inform that it is against local rules.

Many participants reflect on these earlier ways and express sadness that these things have changed now. The scale of such communal fishing has greatly diminished with fewer groups engaged in the activity. In contrast to the earlier dividing of the catch among all, now it is divided among those who work only. I believe it is the removal of the social element which causes more importance to be given to individual gains. Giddens (1990, p. 21-22) views the "'lifting out' of the social relations from local contexts of interaction" as a "disembedding of social systems". Giddens (1990) further identifies money as a form of disembedding mechanism in societies shifting towards modernization.[18] It is the monetary gain that people are now concerned with as can be seen with the recent processing of community fish for selling in the market.

The changes in present day communities itself is a main cause for the changes in how the resources are valued. As can be seen by the lower cooperation among community members, and explicitly stated by them, the reason is the low returns of benefit from the catch. A modern view of accounting costs and benefits have replaced the earlier system of gift giving and reciprocity. This change in community fishing is an example of adaptation to the market economy. Perhaps this is an example of interactions between the short-term and long-term transactions described by Parry and Bloch (1989). These changes in the immediate short-term transactions are acceptable to the extent they do not interfere with the long-term sphere of social norms within the community.

A factor contributing to the social disembedding is also the migration of families to the capital, leading to lowered personal interactions within the community. Reduction of such personal interactions make it easy to make market transactions. At the same time the heterogeneity of the community also contributes to these changes. As discussed earlier in this chapter, traditionally the communities were more homogeneous in their resource use and needs (Figure 5-1). The homogenous use and needs within the community is reflected in the reported compliance and ease of enforcement in local rules in earlier times. This can be contrasted with the present difficulty in enforcement and the lowered compliance reported by the community members. Heterogeneity in resource use and needs does in fact cause difficulties in the management of the resources (Baland and Platteau 1996; Ostrom 2006).

---

[18] The nature of money has been widely discussed by scholars such as Parry and Bloch (1989) and Simmel (1978/2004) among others. A review of this literature is provided in Chapter 3.

The beliefs and moral values held within the community also contribute to the norms and behaviours relating to the use of these resources. These modes of conduct play an important role as regards to how the resources are viewed. In traditional Maldivian communities, Islamic beliefs shape the everyday lives of the community. The norms of resource use for many of the marine resources are governed by the belief that all provision, *rizq*, comes from Allah and the due measure for each person is pre-determined. The other belief relating to this is that each person must strive to get their *rizq* in a lawful manner.[19] These beliefs lead to such behaviours that ensure one does not take too much of a resource and there is plenty for others to use too.

These norms can be seen in other types of fishing and also the catching of bait. Many fishermen explain that even when throwing the bait to the school of tuna, fishermen throw in such a way that other boats can also fish from the school. Another example of such norms given by fishermen was that fishermen will not remove any *oevaali*, any drifting object under which schools of tuna can be found from the sea. Once a boat has caught enough they will leave it for the next boat to use. This is an unwritten rule practiced by all fishermen. These norms ensure everyone can use the resources and also is a security that others will do the same. Faiz, an elder and retired fishermen from Dharavandhoo describe how the belief in *rizq* is incorporated into their use of fish from the lagoon.

> What happens is whoever sees [the school of fish] will go to it. Will go and fish from it. The sea is not for any one person. What is in the sea is a *rizq* God has provided for everyone. Whatever amount of rizq a person is meant to get on that day he will work for that amount.
>
> ފާއިޒު: ދެންވާނެގޮތަކީ ހަމަފެންނަން [illegible] ގޮސް އަޅާނެ. އަޅައިގެން ހަމަ އެއަރިހުން
> މަސްބާނަން. ކަނޑަކީ ވަކިމީހަކަށް އޮތް އެއްޗެއްނޫނިއްޔަ. ކަނޑުގެ އެއީ މާތްކަލާނގެ
> ހުރިހާއެންމެންނަށް ދެއްވާފަ އޮންނަ ރިޒްޤެއް. އެމީހަކަށް އެދުވަހުއެރިޒްޤް ލިބެންހުރިވަރަކަށް
> އެދުވަހު އެމީހަކުއެވާވަރަކަށް މަސައްކަތްކުރާނެ.

---

[19] The interaction between predeterminism and freewill are theologically complex and is in much discussion among scholars (Taib 2000). A discussion on that is beyond the scope of this work. In relation to this work and Maldivian societies, these two concepts are believed and understood in Maldivian societies on the basis of Quran and Islamic teachings.

The elders believe these norms of considering others are eroding and people are more concerned with individual gain. The elders attribute this selfish behaviour as a reason why the scads do not come in any more. It is a common belief by elders that all provision being provided by Allah, it will continue to be given if people behave in morally right ways. This includes being respectful to the fish and not harming them and also not taking from another's *rizq*. Shareef, a fisherman in his early sixties from Dharavandhoo, gives the example of the scarcity of bait in the southern atolls as being due to their bait fishing techniques which are harmful to the bait.

Whether the lack of scads in present day is from the behaviour or for other combinations of reasons one thing is quite true: these earlier modes of conduct ensured these common pool resources were used justly among the community. As can be seen from the examples of scads and community fish, changes in values are indeed occurring and the direction of these changes appear to be from collective to individual values.

5.4.3 Conservation vs. Preservation Values

When families move away to the capital, the youngsters not only lose interaction with the reef resources but also lose much of the local knowledge that comes with the experiences. The local knowledge is replaced by the globalised schooling in the capital.[20] Instead of everyday experiences in the reef environment, it is the schooling in the capital that is impacting environmental values held by the young generation. According to scholars on environmentality, schooling and government programmes are often used as ways for states to create environmental subjects (Nadasdy 2003; Agrawal 2005a). Many youngsters I met tended to show a general environmental concern over global scale environmental issues.

What was important to the youngsters with regards to the local scale was the relation of local and global environmental issues. For example, climate change was a major concern and linked with it comes the concerns for sea level rise which locally translates to issues of

---

[20] I do not regard globalised schooling itself as an issue, for knowledge can never be wasteful. Though, globalised knowledge should not be gained at the expense of losing our local knowledge. I feel privileged by the many things I have learned through globalised schooling and at the same time am grateful to the local knowledge I have gained during this research. A discussion of culturally relevant schooling in the Maldives is provided by Saeed (2003).

beach erosion and thus to the mining of sand and coral from the island environment. Expressions such as "protect" and "prevent extinction" are commonly used by the younger generations. In contrast, many locals, who are not schooled in the globalised system, do not believe climate change and sea level as a reality. They do present very rational counter-arguments, based on their interaction and observation of the local environment.

Environmental concern seems to be a new direction of research in the valuation of nature. Many valuation studies of natural resources seem to focus on how people value places for their own sake, rather than for its usefulness to humans. For example, some people value the idea of there being wild spaces although they may never visit them (Gruen 2002). Such values about the existence of nature have been referred to as intrinsic values (Gruen 2002; Pearce et al. 1989). A value "that resides "in" something but which is captured by people through their preferences in the form of non-use value" (Pearce et al. 1989, p. 61). Total economic valuation concept incorporates the idea of intrinsic values as an important other value (De Groot 1994; Cesar 2000). This trend towards valuing nature for its own sake can also be seen in the advocacy role of international conservation agencies.

I acknowledge that there is a wide contesting literature on the concept of intrinsic value. McShane (2007, p.46-47) calls intrinsic value the "theoretical holy grail" of environmental ethics. Among the debates are those about defining what is intrinsic value, whether nature has intrinsic value and more recently whether intrinsic value is a useful concept in thinking about how and why the environment matters to us (Gruen 2002; McShane 2007). Delving into the rich body of literature on intrinsic value is going beyond the current research. I would like to briefly look at how intrinsic value is defined and explain my use of the term here.

Generally, intrinsic value is identified as something that is internal to the object and is quite apart from its relation to humans and thus valued for its own sake (Pearce et al. 1989; Gruen 2002; Reser and Bentrupperbäumer 2005). While this definition provides a distinction between instrumental and intrinsic values, there is a further issue whether value can exist without a valuer. Can intrinsic value exist independent of human perceptions? This is one of the ongoing debates in relation to intrinsic value. Stemming from these debates intrinsic value can be taken either as a value that resides in something totally unrelated to humans or as a value that resides in something but which is captured by people's preferences (Pearce et al.

1989). It is the second definition that I use in this work, as the value concept used in this thesis is based on value as a human construct. For example, it is a value constructed by elders that places scads as creatures similar to us with feelings and capacity to understand pain and a right to their own existence as creations of God. Similarly the regard by younger generations for preserving nature comes from their ideas and preferences regarding nature.

As I was doing research related to reefs, the youngsters were quite interested to initiate conversations about the environment and its protection. My visit to the communities coincided with the end of the year school holidays, and thus many youngsters were back home. This provided me with the opportunity to engage with many of them. Their views reflected this new direction of global environmental concern, namely an emphasis on the preservation of nature. Leena, a teenage girl from Kendhoo, who had just finished her Year Ten, was quite interested in talking about erosion and at the end of our conversation pointed to how people still continue to take sand and coral. Her schooling and environmental values learnt was judging the actions of the others in the community. Similarly, Hilmy, a youth from Dharavandhoo, working in the tourism industry, had concerns about many tourists and locals visiting the nearby reef, which is among the few spots that whale sharks are known to be found in the Maldives. Their new schooling as well as the fact that they are mainly living away from the resources contributes to these preservationist ideas. Studies on spatial relationships and ecosystem values have found that those living at greater geographic distances from a resource have more "intrinsic, future, and life-sustaining values" (Brown, Reed and Harris 2002, p.62).

Through discussions and observations I realized there is a discontinuity from this global environmental concern to actual local behaviour among the present generations. Almost like switching from fiction to reality. It would be so for them, for global environmental issues learnt through their schooling are to them abstract ideas. For example, catching of scads is simply seen as something fun to do. It was fun to catch lots. Scads and their use do not fit into this environmental concern as they cannot relate scads to any of the global environmental issues they are concerned about. Their only value of scads is for recreational use and as they are not residing on the island all the time they do not have the same need for ensuring the scads stay in the lagoon. Therefore, they do not show as much compliance to the local rules developed. In fact, some, like Fathuhee, a Dharavandhoo island official in his thirties, are even critical of the local rules as saying that they were made for the benefit of the people and not over concerns for nature or the resource.

> What happens [then] is when the fish come in, the thinking [of people then] is to protect the fish from going out so many people can benefit from it. Really, the thought then is for many people to get blessing from it. Those kinds of things then. There is more concern then for what is important for the lives of the people. Things are done in that way.
>
> ފަތުހީ: އެއީ ވާގޮތަކީ މަސްވަދެ ފަޅުތެރެއަށް ވަދެއްޖެކަމަށްވަންޏާ އެބޭރަށް ހިފައިގަންނާތީ
> ޕްރޮޓެކްޓްކުރުމަށް ބަލައި ގިނަމީހުންނަށް އޭގެން ފައިދާ ލިބޭނެ ވިސްނުން. ގިނަމީހުންނަށް
> އޭގެން ނިޢުމަތް ލިބުމަށްބަލައި އޭރުގެ ވިސްނުން. އެކަހަލަ ކަންތައްތައް އޭރު. ދެން
> އޭރުގެ މާބޮޑަށް ދެން ވިސްނާނީ އެއްކަލަ މީހުންގެ ދިރިއުޅުމަށް ބަލައި އެންމެ ބޮޑަށް
> މުހިއްމުކަންތައްތަކާ އޭރު މާބޮޑަށް ވިސްނާނީ. އެކަންތައް ކޮށް އަންނަނީ އެގޮތަށް.

Fathuhee is among the youth educated in the globalised system, who believe that the earlier generations did not have a concern for the environment as such but were more concerned with how things affect their lives. To the present generations, this day to day living with nature may appear as lacking in concern for the environment. Living amidst nature means a high dependency on nature and yet at the same time knowing and adapting to its unpredictability. The fishermen talk of not being able to know in advance where they would find tuna that day. Therefore, what is important to them are the benefits that can be obtained when a resource was available. The use value is predominant in this case. This is something the present generations do not understand, as for them food is available from the shops. People not in direct interaction with resources have been thought of as over-romanticizing the situation and not really understanding the need and use for the resource. (Kennedy and Thomas 1995; Wildcat 2009). In fact, preservationist ideas are unfamiliar to many indigenous cultures (Hunn et al. 2003).

Moran's (2006) view that such polarised preservationist-conservationist thinking, such as debated between Muir and Pinchot, does not exist in many traditional cultures seem to be very true in traditional Maldivian communities. While they appear to be concerned for the use values from scads only, at the same time elders demonstrate concern and respect for scads too. The elders viewed the scads as creations from God to which respect must be shown. They believed scads to be sentient beings with similar feelings as people and were against fishing techniques that harmed or injured them. The religious beliefs of the community promote respect and caring for all God's creatures and using only when and what is needed. This can be seen in the practice of halal slaughter of animals by the communities. In all communities, elders were very upset that youngsters now use nets, throw stones or even spear the scads to catch them. The elders believe the scads feel this pain and that is why they do not return. Such beliefs are often laughed at by younger generations as ancient beliefs. Participants from Dharavandhoo explained that the person who does *fanditha*, a local practice of magic, to bring in the scads into the lagoon refuses to do it now as the younger generation harms the fish. Manik explained that the person actually sheds tears when such things are done.

> “There is a person who brings in the fish when we ask him to. What he says is when people cause harm to the fish it makes him sad. He feels very hurt. The fish they will get harmed, isn't it. What he says is the person who taught him [*fanditha*] said never to cause harm [to the fish]. They are such blessed beings. They should not be harmed. Because [people] harm he does not do it anymore. That is how it happened.”

> މަނިކު: މިހާރު އަހަރުމެން ބުނެ ކިޔައިގެން މަސް ވައްދާ މީހެއް އެބަހުރި. އޭނަ ބުނާ ވާހަކައަކީ މީހުން މަހަށް އަނިޔާކުރަންހެދީމަ މީނައަށް އެ ދެރަވަނީ. އަސަރު ކުރަނީ. އޭއްޗިއްސަށް ހަމަ އަނިޔާ ވާނެއެއްނު. އޭނަބުނަނީ އެމަސް. އޭނައަށް އެ ދަސްކޮށްދިންމީހާބުނަނީ އެއްވެސް އަނިޔާއެއްކޮށްގެންނުވާނޭ. މިކަހަލަ ބަރަކާތްތެރި މަޚްލޫޤުންނޭ އެއީ. އެއަށް އަނިޔާއެއްކޮށްގެންނުވާނެއޭ. އަނިޔާކުރާތީ މީނަ މިކަން ކޮށްނުދެނީ މިހާރު. އެއީވާގޮތަކީ.

Clearly, it cannot be said that earlier generations value scads for their use value only. I argue that earlier generation in fact held intrinsic values for these resources as can be seen from the respect and regard they show in using them. Many indigenous cultures share similar views towards plants and animals (Berkes 1998, Moran 2006, Gombay 2010). Traditionally, value philosophers had assigned such moral consideration for beings or things which had qualities such as rationality or sentience (Gruen 2002). Here, the community members are demonstrating seemingly polarised values towards the same resource. Although I refrained from making prior judgements of how things would be it is hard to separate utterly one’s thoughts and wonderings. My readings on environmental values as well as my own ideals had not prepared me to find these two opposing valuings. Then after much thought I realized this is because of the way I had, over the years, developed to view human-nature interactions. It may seem opposing when viewed through globalised worldviews where humans are seen as external to nature but many non-globalised societies, on the other hand, view themselves to be an integrated part of nature (Moran 2006).

The difference in perception of the environment according to Ingold (2011) is whether we view the environment as inhabitants or exhabitants. This I found to be the key to viewing the values held by the local communities. In their worldview, humans are part of nature. The earliest local words used to mean the collective environment are *maahaul* and *veshi* which means one's surrounding. A more recent word coined for use as "environment" is *thimaaveshi*, a concoction of *thimaa* (the self) and *veshi* (surrounding).[21] *Thimaa* is also used in *thimaa-ge* meaning kinship relations. Thus, *thimaa,* denotes a personal relationship with one's surrounding. In this regard, the new word captures the local scale and the integration of man within nature. The more familiar usage of the term *thimaaveshi,* by policy makers, as relating to global environmental concerns makes the word more recognized as environmental concern among local communities.[22] I came to realize this after initial interaction with the communities and I learnt to avoid using the word *thimaaveshi* in my inquiry. Instead I used words meaning island, reef, house reef, ocean, lagoon for specific parts of the reef ecosystem.

Those living in the island environment could value scads for their benefit as food and yet at the same time value them as sentient beings. While these may seem conflicting to globalised worldviews, it is very commonsensical in the local worldview. In this local worldview there is no need for thinking separately in terms of conservationist and or preservationist. The local values regarding the resources come from simple everyday existence and interactions with the resources and particular beliefs arising from their cultural and religious background. In is local worldview these non-human creatures had a right to their own existence as creations of God, whether they are useful to humans or not. Perhaps these are ways of showing how the elders value God. Redfield (2008, p.204) suggests that in primitive worldviews "man and nature and God are not sharply distinguished but constitute a single system of entities not entirely separable from one another". In the present day situation such ideas will be thought of as foolish by the younger generation but there are numerous

---

[21] Personal communication with Abdulla Sodig, former advisor for the National Centre for Linguistic and Historic Research, who coined the term. According to Sodig, in its original meaning *thimaaveshi* refers to the social and natural environment of an individual or group.

[22] According to Sodig, this was not the intended use of the word. Sodig suggested that the term *dhuniyeyge veshi* was more appropriate for the global environmental.

examples of such regard in many non-globalised cultures. For example, the Achuar of the Upper Amazon consider most plants and animals as persons living in societies of their own (Moran 2006).

5.5. Chapter Conclusion

Presently island communities are not as homogeneous in terms of how they regard the resources in the lagoon. The two main factors influencing this have been the reduced availability of the resource and the level of interaction with the resource. While participants provide various theories on why there is reduced occurence of fish coming into the lagoon, This decreased availability is a main reason for the diminished interaction with the resource. Migration of families to the capital is the other contributor to reduced interactions with the resource.

These resources seem more valued by elders and fishermen as important needs for the community. In contrast the younger generation find the resources to be for fun and sport. The elders and fishermen are concerned with ensuring that fish remain in the lagoon for a long time whereas the younger generation has more concern for global scale environmental issues. The increased regard, by those living in the community, comes from increased interaction and dependence on the resource. Thus, they have a better understanding of the unpredictability of the resource and nature and their lack of control over these.

Going into the depths of kinds of value held by the communities, I have come to realize that local worldview functions in a very different way to the globalised worldviews that are more commonly discussed in theories. The distance created between the resources and the younger generation due to migration to the capital is also a distancing from these local worldviews. The change in values across generations is much related to this change in worldviews. These changing worldviews mean another more grave loss, the loss in social norms and morals. The practices and behaviours people adhere to in their daily interactions are getting eroded. The daily interactions with the resources, their distribution and sharing within the community all involve many a social interactions within the community. Fish is more than food to the communities. It is through the catching, exchange and sharing of fish that the communities practice their values and beliefs.

The consideration fishermen show for one another during fishing is behaviour stemming from their beliefs and values that the resources are created for everyone to use and hence, all should be treated with the same consideration that they would like from others. The giving and sharing of fish is another practice which strengthens social bonds and caring for one another. These everyday practices ensure these morals and values are passed down through generations. Without the direct interaction with the fish such behaviour are not getting practiced on a daily basis. Without these everyday life practices these morals and behaviours are becoming things children are learning from school books.

Throughout the thesis I have been looking at different reef resources that communities interact with to infer how they value these resources. This chapter concludes the examples I have chosen to reflect upon, in my inquiry of how small communities interact with their surrounding reef resources. So far, I have explored both stationary and mobile resources that communities interact with. What do these values and value changes mean to the communities? What implications could an understanding of these values have for the way resources are managed, both by local communities and the state? Could an understanding of these values and ways of interaction with the resources inside the house reef help management of resources in larger scale areas such as the atoll waters or even at larger scales such as regional or global? These are questions I want to contemplate over and would be addressed in the next chapter.

6. Changing Reef Values

6.1. Introduction

Valuation of nature and natural resources is described, by resource managers and resource valuation experts, more as a means than an end. It is a means to convey the importance of natural environments, argue for its protection, influence policy decision about the environments and to guide conservation efforts. These were many of the reasons that drove my earlier Master's work on economic valuation of coral reefs in the Maldives. To gain support for better management and protection of marine resources from policy makers, I wanted to demonstrate that "conservation [or rather preservation] of nature can result in tangible economic benefits to people" (Naidoo 2008, p.2).

Through my interactions with local communities, during my work on economic valuation of coral reefs, many questions were raised in my mind regarding why valuation of coral reefs were important. Most importantly whose values really count. If the main purpose of environmental valuations is to ensure better management of nature, prevent its degradation and to ensure its existence for future generations, then would it not be those living in the environment most suited for this purpose? Then should it not be their values that need to be considered? Having lived in the environment for generations, would not their historic connections to the land and its surrounding be important for them to ensure its existence for the future generation? Such thoughts formed the main basis for this current research which explores how local communities value their surrounding reefs and their resources. In contemplating further on these questions a firm grounding of this thesis is that valuation of nature and natural resources should go beyond monetary and tangible benefits to include the social and cultural aspects of value.

My journey through this exploration of the value of reef resources is presented in the preceding chapters of this thesis. I have explored and discussed the different ways to approach such an inquiry into human values as well as the relevant bodies of theory in

Chapters 2 and 3, respectively. The discussions in the subsequent chapters focused on how different reef resources within the house reef are used and managed by the communities. Specifically, I have considered the sand from the island beach, the coral from the house reef and fish in the island lagoon. The ways that the communities interact with these resources, use and manage them are explored to interpret how they are valued.

In this concluding chapter I will be reflecting on the research, both the process and the findings. I will draw from my earlier discussions on how the different reef resources are used and managed to engage deeper into the changes occurring in resource values. How are the values changing and what are plausible reasons for these changes? Finally, I wish to conclude the thesis by looking at the wider implications of this research. What does the changing reef values mean to the communities who live within the reef environment? How does these changing values need to be considered in the future management of these resources at local, national and global levels?

6.2 Reflections on the Knowledge Process

I believe the process through which knowledge is created is of utmost importance as it is within this process that you come to understand much more than just answers to academic research questions. Berkes (2012[1999], p.xix) also emphasises this importance distinguishing between the two as "knowledge, the thing known" and "knowledge, the process". Knowledge, the process is also a discovery of the self and the ways of how your own thoughts, ideologies and ways of looking at the world, the surrounding environment, have been shaped as you complete the journey.

First and foremost at the onset of this research I had come to realize the importance of a qualitative approach into such an inquiry about human values regarding nature. This does not mean I reject quantitative approaches of inquiry altogether but it is for this particular type of inquiry that I find the qualitative approach more suited. I had also come to the belief that when inquiring about the value of reefs and their resources it is the views of those that are living in the environment that need to be considered. Researchers, educators, resource managers and policy makers need to understand the importance of looking at local resources from the worldviews of those living there. It is the perceptions of local communities and how they value the surrounding reefs that is key to ensuring the continued maintenance and existence of the reef environments.

I believe my main role as the researcher is to convey the voices of the communities to the outside world. As such I hope the community perceptions are fairly and accurately portrayed in the discussions and analysis presented within this document. I also hope that the community perceptions presented in this thesis would be used by others, especially in the management of reef resources.

It is rarely that any research work, qualitative or quantitative, goes perfectly as planned, and even in the planning process there are limitations and constraints that have to be faced by the researcher. I explore some of these limitations and also identify possible further work in the area. As I have discussed earlier, even those who focus on economic valuations of the environment highlight the difficulty in finding all possible values of nature and natural resources. While this research does not attempt such quantitative valuations, there still exist many difficulties in exploring natural resource values that incorporate social and cultural aspects of value.

I had initially looked at including the broader atoll level while exploring how local communities value the surrounding reefs and reef resources. This would allow me to explore all interactions that locals have with the reefs and would give a comparison of the way that local communities value the reef resources within their house reef and those outside in the atoll waters. Once in the field I came to realize that the initial scope of my work was too wide to inquire into reef values justly. Firstly, an exploration of reef values at the island level itself is a huge task. Therefore, the analysis of my information focused on the values towards reef resources inside the house reef only. This leaves opportunity for future work to explore how the reefs in the atoll waters are valued by communities. Such a study would allow comparison of the ways that reefs within the two regions are managed.

Coming to the reduced scope of looking at reef resources as the island level only, it was still a difficult task to explore meaningfully all the different resources and the ways communities interacted with them. For these reasons, I have chosen to explore sand, coral and fish in the lagoons but there are other types of interactions that I had to leave out. For example, collecting seafood from the house reef when the reefs are exposed the most, at full moon, is an activity that is enjoyed by communities. My visit to the island of Makunudhoo coincided with this time. I had the opportunity to collect seafood on this island and I was surprised at the number of people who went for this activity. I met families, parents and young children, carrying little bags on the reefs. I would have liked to explore further this activity in terms of the value of reefs but before I visited this island I was not aware of this use at this scale. Many of the reef related activities are seasonal and based on availability. Therefore, future work could focus on a more detailed inquiry into a specific community by a prolonged stay in the research environment.

One of the most important and highly valued uses of reefs by all communities is for catching bait used in tuna fishing. Traditionally everyone in the island communities went tuna fishing and thus, availability of bait was the most important condition for a good fishing day. Its historic roots and the changes over time were quite interesting but as bait grounds were located outside the house reef meant these places were visited by people from other islands in the atoll and sometimes by people from other atolls. The sea belongs to everyone is an unwritten rule accepted by all communities. These increased interactions would add another layer of complexity to the current research and hence, was avoided. Further work can be done separately either specifically for bait grounds or even the use of the atoll waters at large. I am aware that currently there exist many scientific inquiries into bait fishing but here I am stressing the importance of a study that focuses on the social and cultural value of bait fishing.

One of the most rewarding aspects of this research process has been the many fascinating stories that I have learnt from participants. Many were traditional stories that I had not heard before. For example, the story of how the skipjack tuna was formed, the role of skipjack tuna in the conversion to Islam by the community in Kendhoo and stories of fishermen's adventures at sea. Discussions about these stories taught me ways to look in a new light at other stories I had grown up with. I am especially interested in pursuing an inquiry into traditional stories and ways of interpreting the surrounding environment through these narrations.

It would be of utmost research value to go beyond the Maldives case study and compare these findings with similar work done on island communities such as in the Pacific. For example, there is considerable work done, in the Pacific and other tropical nations, to explore traditional coral reef management practices and their role in the conservation of coral reefs (Aswani et al. 2012; Cinner 2007; Cinner, Marnane and McClanahan 2005). As highlighted in such studies, to ensure success of modern adaptive management approaches to reef management it is important to understand and integrate traditional management practices.

Ways in which the current research could complement and support adaptive management of reef resources in the Maldives would be a possible next step. As can be seen from the cases presented in this research, local management institutions for reef resources share many similarities to adaptive management processes. For example, adaptive management acknowledges that ecosystems are changing and unpredictable in nature. This is a reality that communities living in the environment understand well and keep in mind in their management practices. Thus, local management practices are based on learning from the experiences of living in the environment. Similarly adaptive management is also a learning process based on trial-and-error to improve management practices. Berkes et al. (2000, p.1260) identify adaptive management as a "rediscovery of traditional systems of knowledge and management". I believe there are many opportunities for including the local knowledge, the ecological and management processes, into adaptive management. This would prove to be an essential step for better management of reef resources.

The more one reflects on the research process, the more one can see the creases and corners that need to be smoothened. In this sense, the various issues I have drawn attention to in the above discussion is not by any means a complete list of limitations and future work. It is quite impossible to finish a work perfectly; there always remains more to be done. Reflecting on the knowledge process is a way to learn from what has been done. Thus, I believe this journey has been an extremely successful learning experience, both in terms of the learning process and what has been learnt. In the next section I provide a discussion of the specific knowledge on reef resource use, management and changes in reef values, learnt through this process.

6.3 Changing Resource Use and Reef Values

What does the information from the different communities show about the changing values? I found that such an analysis was not simple as human values relating to natural resources are complex (O'Neill, Holland et al. 2008). Many intertwined relationships existed, one contributing to the other in how resource are valued and how these values have changed in the communities and across communities. The only constant is the observation that values are continuously changing. The values that each individual holds is changing based on his or her interaction, both with the physical and social environments.

Based on my analyses of the information on the use and management of reef resources, I found the most important relations to the changes in resource value are (i) changes within the communities and (ii) changes in how communities use the resources. I found that the former also affects how resources are used by community members. Previous discussions show that how communities value the reef resources within the house reef has changed considerably. From a relatively low level of use for traditional purposes, sand and coral from the island environment found a new use value in the construction of local dwellings and other communal infrastructure. As discussed in Chapter 4, the effects of island erosion from the increased use of sand and coral meant all communities began to value the protection provided by the sand[1] and coral. Thus, one can see a range of different values, traditional, commodity and protection, for sand and coral. At both community and individual levels, sometimes these values exist simultaneously and at other times one value gets replaced by the other. Always there is prioritizing of values, whether this may be replacing use values by protection values or transferring the use value to a resource located elsewhere as in the case of continued sand mining from sandbanks outside the island environment.

Similarly, values towards fish in the island lagoon are multiple and are always changing. Initially valued for subsistence fish in the lagoons are now mainly regarded for their value in recreational use and market exchanges. The use for subsistence itself was an enjoyment for the communities as demonstrated by the catching of scads and community fish. The use of these fish also demonstrate that the interaction with resources also create community value. The concern by all community members to ensure the continued presence of the scads, the communal effort in preparing and catching community fish and the sharing of fish among members all demonstrate the influence of resource use and interaction on community social values. Similar social relationships and community values are created in

---

[1] As stated earlier, the contribution of sand to island erosion is still contested among participants at individual levels. This is again based on their individual experiences with mining sand for a continued period of time.

the reciprocated labour when using sand and coral in the communities, whether it be mining the resource, bringing it to the location or making cement and the construction of houses.

These changes, as can be seen, are associated with how the communities use and interact with the resources. I believe these changes are a result of many alterations in the natural and social environments. Some of these changes are represented in Figure 6-1. This representation is based on my discussions with communities, my observations and reflections on this study. Thus, I acknowledge that that this would not be representative of the whole story which each individual constructs through his or her experiences and interactions.

Before continuing to a general discussion of these changes, I would briefly summarise some of the specific changes observed among the study islands. In all islands the use of sand and coral had changed from traditional to use as a commodity[2]. With regards to fish in the lagoon, the main differences observed are based on the physical size of island, community size and migration of families to the capital. For example, the islands of Hulhudhoo and Meedhoo being very large have comparatively larger lagoons. This perhaps is a reason why I observed more interaction with lagoon fish in these communities. In Hulhudhoo and Meedhoo, some fishers catch them for food and selling whereas in other islands the interaction is mainly for recreation. In contrast, I found more interaction with scads and community fish in the smaller, less populated islands. I note the population size as an important factor as communities where community fishing was done now report that the practice has ceased due to the lowered shares that an individual gets when distributed among the whole island. I also note that in Hulhudhoo and Meedhoo where migration to the capital had started much earlier, the number of youth involved in reef related recreation is less compared to other islands where a large number of families return to islands for holidays. These are some plausible reasons for my observations but further investigation is needed to explore these relationships.

---

[2] To maintain anonymity of study islands regarding use of sand I cannot go into more details of specific communities.

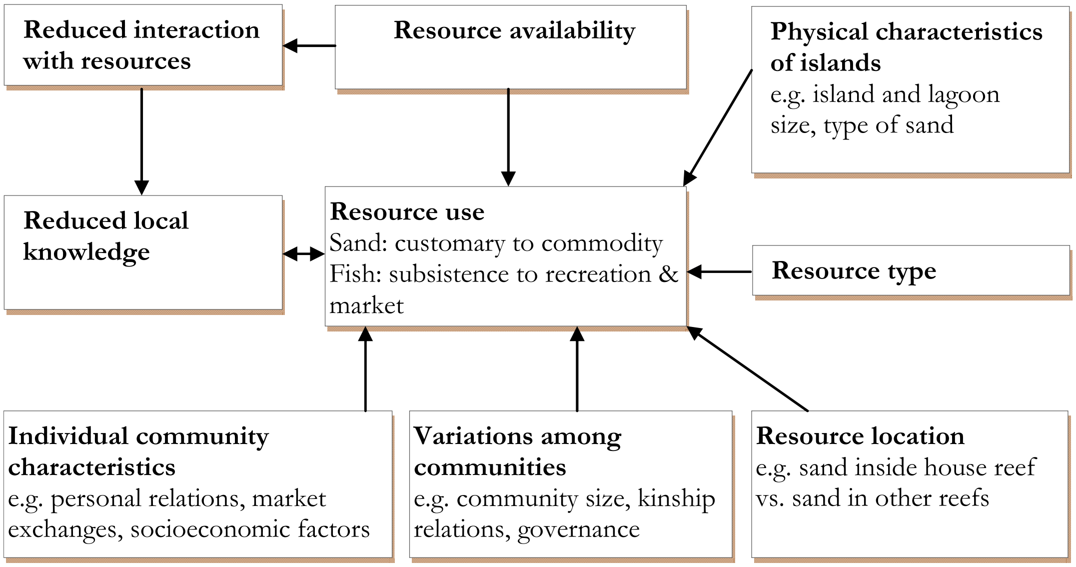


Figure 6-1 Factors influencing resource use in the communities

6.3.1 The Physical Environment

First, I will focus this discussion on characteristics of the physical environment that has contributed to the change in how resources are used and valued. The type of resource is one such factor. Each resource is used and valued differently depending on the characteristics of the resource. Sand and coral due to their stationary nature can be depended on to stay within the house reef. Especially with traditional use the fear of its depletion was not present and thus locally not many rules were developed to manage sand or coral. On the other hand even in traditional times, the more mobile scads had many rules for their use. These rules ensured that when scads do come in they stay for a long time. If comparing how fish in the lagoon are valued, the short duration of stay for community fish causes them to be more opportunistically hunted than scads which are more carefully fished to ensure a longer stay. These management methods show that differences in the various resources affect how they are used and managed by the community.

Local knowledge about the natural environment and fish ecology are quite effectively used in the management of these mobile resources. According to Berkes (2012[1999]) such knowledge possessed by traditional communities form the basis of resource management systems. This relationship between local knowledge and resource use is complicated as one is interdependent on the other. This complicated nature is also pointed out by Berkes (2012[1999]). While local knowledge is crucial in the ability of communities to make the best possible use of resources, changes in the way resources are used would lead to communities losing knowledge on these methods of resource use. For example, earlier money cowrie was collected from within the house reefs but without this activity being carried out people have lost many local knowledge associated with it.

The mobility of fish is also linked with such resources not being available all the time. The availability of the resource is also an important factor in how values toward resources have changed. All communities reported that fish such as scads and community fish do not come in like they used to earlier. This leads to reduced interaction[3] with the resource as well as lowered dependency on it as an important food source. These changes combined with other community characteristics, such as families not permanently residing in the island, has led to scads being enjoyed more for their recreational value.

The differences in the physical characteristics of the islands are also contributing factors. For example, in general I have observed that there are more lagoon fish in the larger islands compared with the smaller islands. I am not saying here that I have found a definite relationship between the island size or lagoon size and the availability of fish. Members from the larger islands of Hulhudhoo and Meedhoo say that they have a larger area to catch fish from and hence, can catch lots of fish. This may be the reason that the excess fish is sometimes sold by fishers. As discussed later in this chapter, there are also other social factors that contribute to selling fish. Another example is the use of sand. During my visits I have found that the type of sand in some islands are physically quite different from other communities in the Maldives. As described in Chapter 4, the coarse, gravel type nature of sand in Communities A and B is perhaps a reason why customary use of this specific sand is continued in these communities. Again I would like to highlight the importance of local knowledge for communities to be able to use the resources in these specific physical environments.

Talking of differences in the physical environment, I have observed that values regarding the same resource could also change depending on where it is physically located. For example, many communities now value sand from the beach for its function in providing protection for the island. The same type of sand which can be found in nearby sandbanks,

---

[3] This reduced interaction also is a factor contributing to reduced local knowledge among younger generations.

though, are extracted and sold as a commodity for construction purposes. A similar type of resource valuing can be seen in the example of Indonesian fishers who do use underwater explosives for fishing but do not use these methods in the reefs off the coast of their village (Pollnac and Johnson 2005). These villagers also find the protective function of the reefs near their village more valuable than the economic benefits that can be gained from it.

As can be seen there is a complex array of factors which often are interdependent and influencing one another. The complexity of inquiring on resource values can be further seen when changes in the social environment are also considered.

6.3.2 The Social Environment

In terms of the social environment, the main influences on changing values are the changes within the individual communities and the differences among these communities. Discussion in Chapter 5 show that individual communities have changed much in their relation to resource use and a main change that had been observed was that communities are now quite heterogeneous in their needs and behaviours towards resources. I found that these changes which have occurred over time and across generations is a commonality for all the communities visited. At the same time, I also noticed differences among the various communities which existed in the present day. These changes I believe have also contributed to the way that resources are valued by community members.

I found the size of the community to be an important over-arching factor for these differences. In addition to the governance structure, the size of the community impacted the kinship relations and personal interactions in the community. These factors affected the use and exchange of resources in the community. For example, the larger communities often had less personal interactions among community members and hence, market exchanges of resources were more common compared to smaller communities. Most members in a Maldivian community are often related by kin or by marriage. These relationships are more abundant and profound in smaller communities compared to larger communities. This also is a reflection on the strong social and personal ties within a small community and thus, reduced market exchanges. Market exchanges are believed to be impersonal interactions that are more easily conducted when the level of personal relations and interactions are low (Sahlins 1972; Parry and Bloch 1989).

Governance within a smaller community is often much easier than in a larger community. Literature on common pool resources identify resources are more easily governed when the size of user groups is small (Baland and Platteau 1996). In the first instance, formation of norms and rules relating to use of resources would be much easier in a smaller community. It is especially convenient in small communities as local rules are often made through processes of informal consultation among community members. An example of the ease of formations of norms regarding resource rule can be seen in the case of community fish. While the smaller communities have well identified norms of collective catching and sharing of the fish, such norms are absent in the larger communities. This is explicitly stated by Mohamed Jameel, the Island Chief of Hulhudhoo.

> "The island office, like in other islands, the island office does not make it a formal thing to distribute [fish] shares to the people and things like this are not done much in this community. If a school of fish comes in those who go to catch it are the owners. They manage how to use it. They take it and give to anyone they want to. To bring the fish to the [island] office and keep it in the office for distributing to the community, and to catch collectively as a community, such things have never been done in this community."
>
> ޖަމީލް: އެރަށުއޮފީސް މި އެއްކަލަ ރާއްޖޭގެ ރަށްރަށުގެ އޮންނަހެން، އެ ރަށުއޮފީސް މާ
> ރަސްމީކޮށްގެން އެކަންތައްތައް ރައްޔިތުންނަށް ބަހާދިނުން މާ މިކަހަލަކަންތައްތައް އަޅުގަނޑުމެންގެ
> މުޖުތަމަޢު މާބޮޑަކަށްނުކުރެވޭ. މަސްގަނޑެއްވަދެއްޖެއްޔާ ނަގަންދާމީހުން އޭގެވެރިންނަކީ.
> އެމީހުން އެއާދޭތެރޭ ޢަމަލުކުރަނީ. އެމީހުންނަގައިގެން ނުގެންބަހަކު ދީބަހަރާކަށް ދޭ. އޮފީހަށް
> ގެނެސް އޮފީހުގަ މަސް ބަހައްޓައިގެން އެ ރައްޔިތުންނަށް ހިއްސާވާގޮތަށް ބަހާދިނުމާ
> ރައްޔިތުންގެގޮތުގަސް މަސްނަގާ އެކަހަލަ ކަންތައްތައް މިރަށު އެއްވެސް ދުވަސްވަރަކު
> ނުހިނގާ.

Perhaps the absence of such norms is due to the fact that in a larger community, each individual or household would not get a sufficient share. This reasoning is plausible, as can be seen from the current practices of catching and sharing community fish in the comparatively smaller communities. These smaller communities, though, now have increased in terms of population and many communities find that the benefits from collective fishing is not worth the effort and costs involved. The island of Makunudhoo is an example where such a change has occurred.

The changes within individual communities, as can be seen by the example of changes in population, are factors which have contributed to the change in resource use and to how resources are valued. For example, improvements in socioeconomic conditions of communities had led to changes in use of coral to the construction of more permanent dwellings for the community. The use of coral had earlier been for construction of communal buildings and structures such as mosques, communal wells, baths and gravestones. Again it was the increase in population which increased the demand for coral and sand in the communities and thus, impacted the island system. This was the point where this understanding of impacts led to these resources being valued for its protection value.

I also identified the migration of families to the capital as a major influence on these changes to the community. Presently, in most communities it is the older generations that permanently reside on the island. Those living away mainly come to the island for their annual holiday. Comparing the different communities, more middle aged and younger people resided in the islands of Makunudhoo and Dharavandhoo. This may be because these islands had more employment opportunities.[4] These were two communities where I also noticed the most amount of interaction with the reef resources. Both communities had tuna fishers that still go fishing. The interactions by the younger generations though were mostly recreational. I have attempted to present the various linkages in the changes to the community characteristics visually (Figure 6-2).

---

[4] I would like to note here that although Hulhudhoo and Meedhoo were fairly large communities with employment possibilities, the percent of population living in the communities is relatively less than the northern communities. This may be as migration from these communities had started a generation earlier and the successive generations had not returned to the island but have settled in the capital.

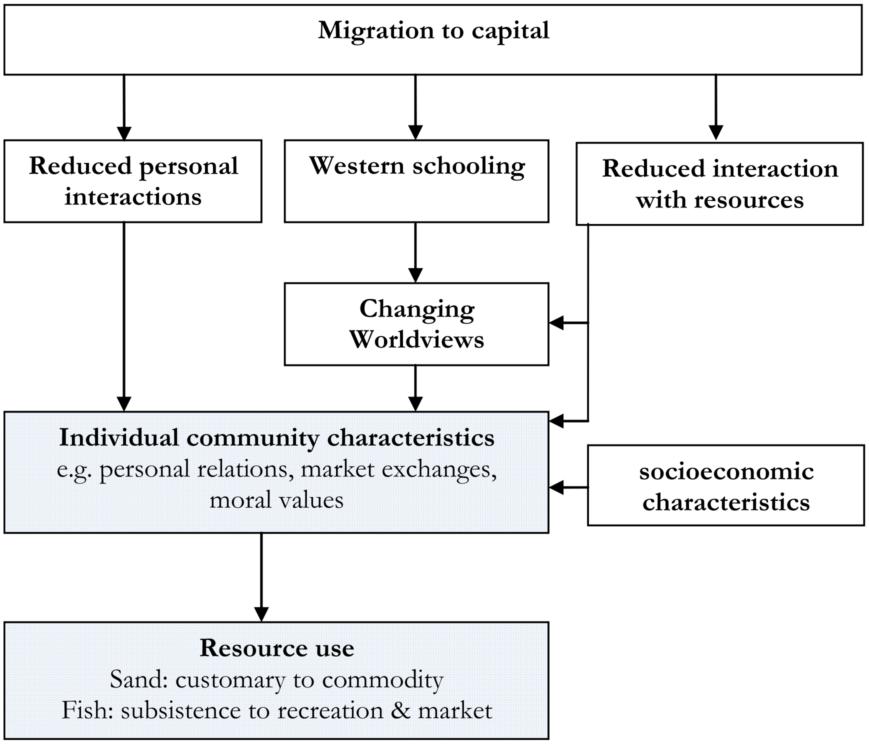


Figure 6-2 Factors affecting changes within communities

As can be seen in Figure 6-2, migration to the capital has had many indirect influences on changes to the community. More or less permanent migration means, the generations living away do not interact much with each other or those living in the community. In some communities, during my visit elders would ask me if I am from the island, as is the customary introductions to conversation. Often these elders would add that now children grow up in the capital, away from the community, it is hard for the elders to recognize the children when they are grown and to know if a visitor is from the island or not. Such remarks by elders of the community reflect the level of impact on personal interactions from migration. As discussed earlier, in relation to community size, such reduced personal interactions make it easier for market exchanges to occur. This is an example of changes from a community realm to a market realm described by Gudeman (2001). Whereas a community realm contains both gift and reciprocal exchanges, a market realm is based more on impersonal transactions. Sakeena's story, described in Chapter 5, is an example of preferences for such market exchanges. Sakeena, when she comes to visit the island, prefers buying tuna from the nearby shop than going to get fish from her aunt's house. This is not just an example of reduced personal interactions and ties among people in general but also of how kinship relations are also severed.

The fact that families live away from the island also means that on a day to day basis they are not interacting with the resources. The younger generation who mostly return to the island for their holidays do not have the same interaction with the resource as earlier generations. Therefore, how they perceive the resources within the house reef is quite different. For the younger generation living in the capital, their food (fish) comes from the market or shops. Unlike earlier generations who lived on the island, those living away from it do not understand the dependency on the surrounding resources for subsistence or the unpredictability of nature. Such perceptions of the reefs are getting diluted as subsequent generations lose daily contact with the reefs. Spretnak (2010) describe a similar loss with subsequent generations, when people living in traditional life styles move to more urban areas. Any interaction with the surrounding reef system is now for fun such as a spot of night fishing or a picnic to a nearby island during holidays. The interaction with the reef for people of my generation, who grew up in the city, are mostly in the form of recreation when going to picnic islands. In Dharavandhoo, I was invited to join a family outing for reef fishing. According to my hosts this was an activity organised for the children to reward their performance in school. Earlier when children lived in the communities these kinds of rewards may not seem so much as a reward. These changes in interaction with the resource means a growing change towards recreational value of reef resources.

The other most notable change is the difference in worldviews across the generations. Worldview refers to ways in which people view their world or environment they live in. According to Redfield (2008, p.196) the self is the axis of worldview and it is worldview that allows individuals to answer questions such as: "Where am I?, Among what do I move? What are my relations to these things?". In this respect, particular worldviews would be characteristic of people living in a particular environment. Hence, those generations who grow up living in the city away from the resources would tend to develop different worldviews towards the reef resources in the islands.

It is not just staying away that influences the worldviews of younger generations, but also the new globalised education curriculum which will help them "participate in the modern global world" (Saeed 2003, p.208). Saeed also identifies that the departure from traditional ways of learning and only giving importance to globalised education as a departure from our local worldviews. "In order to learn the supremacy of the Western [globalised] worldview and its traditions, we learned to negate our own worldview, history, customs and traditions" (Saeed 2003, p.220)

Although the same curriculum is now taught in the islands and the capital, at the start of the migration phase, notable differences could be seen. This included giving a greater importance to religious education and an absence of learning about the outside world in the island communities. Saeed (2003, p.208) gives an account of her Western education in the capital.[5]

> I had the opportunity to enjoy the fruits of the emerging nation into the world picture of schooling in the 1980s. While I never studied the Geography or the History of the Maldives, I learned about the World Wars, the French and the American Revolutions. With no mention of the flora and fauna of the Maldives, I learned about the Savannas of Africa and the Prairies of North America.

I can relate to this when comparing my own primary schooling in the city with that of my husband's in his island. Of the same age, while my education included learning about the countries of the world and its capital cities, the changing seasons and the different human races in the world, he did not encounter such knowledge until he moved to the capital for education. In addition to the knowledge gained from the schools, children growing up in the island environment also learn about the surrounding environment by interacting and experiencing it.

What is most relevant about the globalised education that children receive today is what is learnt about the environment. As stated by Saeed, there is a lack of education about our surrounding environment and rather children are being taught global environmental issues. Through such systems, I see the creation of environmental subjects as described by scholars such as Agrawal (2005) and Nadasdy (2003).

My ten year old son is currently learning about greenhouse gases, rainforests, global weather and climates among others. In the midst of his Environmental Science textbook are a few pages on the "Maldive Islands". Looking through these pages, I noticed the lack of depth about our local environment. Perhaps any world atlas or encyclopaedia would give a similar amount of information about the Maldives. Without the historical context, and experiencing

---

[5] A detailed account of the different stages of schooling in the island of Meedhoo as well as comparisons of that available in the capital can be found in Saeed (2003).

the environment, children would not find the same level of understanding or attachment to the environment. For example, the local tradition of fishing is taught under the title of "Fishing Industry". While industry suggests a market economy, absent in these lessons are many of the linkages to the historical, cultural and social aspects of fishing. What are the traditional stories which pass down knowledge about the reefs, the bait and the fish across generations?[6] How did the fishermen know where to find bait or fish? What did the fishermen do with their catch? How are women involved in processing the tuna? During my visit to the island communities, I myself gained much knowledge about local fishing that I had not learnt in school.

Inserted within these pages are also subtle messages of environmental concern for these growing minds. Taking the example of fishing, the lessons include messages such as "[n]o endangered organisms like dolphins or turtles are killed" (Nashath 2009, p.126). Another example is descriptions of ecotourism and the resorts being built on fragile natural habitats which need to be protected from destructive practices by humans. It is evident that from a young age we are being made to care about global environmental issues. As at the same time our understanding of the local environment is through such diluted information, the worldviews of children today are being geared towards abstract environmental concern. As discussed in Chapter 5, today's youth view the taking of sand by locals as destroying the environment and links this behaviour with island erosion. Their concern being for the impacts of global climate change and sea level rise. In my discussions with younger generations I do not find that there is an actual linking of the mining of the sand to construct the high rising apartment buildings in the city. The concerns are often raised towards people who live in the island communities. Perhaps this difficulty in relating to these concerns when in the city is because you do not actually see people mining sand and bringing it in boatloads in the capital. Even in a local context the concern is for an imagined environment. Ingold (2011) discusses the difference of looking at an environment and inhabiting it.

> We are, these days, increasingly bombarded with information about what is known as ‘the environment’. Seated in our homes, in classrooms or in conference theatres, this environment is flashed before our eyes in images of landscapes, wildlife and peoples from around the globe, often to the accompaniment of facts and figures assembled to deliver a compelling message of change. Indeed, so accustomed are we to viewing images of

---

[6] Saeed (2003) provides many examples of the existence of such knowledge in Maldivian traditional stories.

> this kind that we are, I think, inclined to forget that the environment is, in the first place, a world we live in, and not a world we look at. We inhabit our environment: we are part of it; and through this practice of habitation it becomes part of us too. (Ingold 2011, p.95)

Ingold views the difference in worldviews in terms of being an inhabitant living in the environment and an exhabitant looking at the environment from outside. I agree that such differences is the main contribution to how the environment is perceived and valued. For the younger generations the environment has become a place to be preserved; a place to be protected from human use. This can be contrasted with the way elders through their worldview, valued the environment as a place to dwell in, something they depended on for subsistence and also something through which they could appreciate the Creator. These differences are reflected in the absence of the word *thimaaveshi* in the earlier local language. As mentioned earlier this is a recently developed word describing the social and natural environment of an individual or community.

During this research, I came to notice that changing worldviews are also linked with changes to the way communities integrate the spiritual into their everyday lives. In addition to the globalised education systems, the introduction of market economies and the integration into a global community are all contributing to this change in worldviews. The marked difference in the views and behaviours between elders and the younger generation shows this change. The views and behaviour of elders show that the sacred is well integrated into all aspects of their day to day lives. As discussed in Chapter 5, many examples of this integration can be seen in the way reef resources were managed in the communities. For example, the norms of fishing which show consideration for other fishers and not to impose on the *rizq* of another. The importance given to not taking resources in excess to what is needed and norms of sharing food also show this integrated worldview. Elders often refer to working for a livelihood as a religious activity similar to performing the obligatory rituals of religion.

Scholars on traditional and indigenous societies have noted similar worldviews. This is often contrasted with globalised worldviews where the sacred and secular are viewed as separate (Redfield 2008; Khalid 2010; Fonda 2011). Fonda (2011, p.1) writes that in contrast to European worldviews, "Aboriginal cultures did not have as marked a conceptual separation between sacred and secular, or between culture, language and identity, or between spirituality and the land on or through which it is expressed ... . These things were and, for many contemporary Aboriginal peoples, are all interrelated in Aboriginal worldviews". Similar views of integration between religion and all aspects of life are advocated in traditional Islamic teachings, which are important fundamental beliefs in the Maldivian communities. According to Khalid (1996), an Islamic environmentalism focused on laying down patterns of behaviour which are the norms of the community. The discussion on *rizq* in Chapter 5 shows how the Islamic beliefs of Allah being the creator and sole owner of the land, seas and everything included on this earth and in the heavens is incorporated into forming norms of behaviour towards each other in the use of these resources. As the resources from the sea are a *rizq* from Allah, these beliefs have led to norms of consideration for the *rizq* of others.

These beliefs and behaviours are slowly fading and in many aspects of life Maldivian communities have separated the spiritual from the secular. Whether in resource management, the economy or the political arena, religion is viewed as something that needs to be left within the walls of the mosque or in people's personal life. An example of this separation is the widely critical view of many on the formation of a religiously based political party in the Maldives. The opinion being that the role of religious people should be to address religious matters rather than political. The idea of religion as having separate functions and purposes than political societies had become insitutionalized in globalised liberal democracies and through colonization had spread to societies where such demarcations did not exist (Fitzgerald 2007 in Fonda 2011). Khalid (2010) identifies such changes are in almost all Muslim states today. "Civil administration has separated itself from the body of the people who are coming to be known as “the religious authorities” i.e. a clergy, which is not recognised in Islam" (Jostad, McAvoy and McDonald 1996, p.17). According to Khalid (2010), these changes are a result of the difficulty in applying traditional beliefs in a modern global world, where even Muslim nations need to conform to modern ways of exchange and trade with other nations. The Maldivian society today, exists in such relationships with the global world with focus on economic development. Many of the elders from the communities have pointed that with the importance given to money, many of the traditional norms and values are disappearing. This is their indication to me of the changing worldviews that they have observed and lived through.

As can be seen from the above discussion, a variety of factors, physical and social, have contributed to the many changes to people's perceptions and values towards reef resources. There exist complex linkages and feedback mechanisms between these changing resource values and the many factors that contribute to these changes. These changes should not be ignored but need to be understood and given consideration as these influence the way resources are managed in societies and also affect the community relationships that exist. In the next section, I will go beyond the specific findings of the thesis to explore the implications of these changes in reef values for the local communities and as well as resource management in general.

6.4 Looking Beyond the Changing Reef Values

As pointed out in the discussions on value formation, value is not a quality of the object itself, but are judgements formed through the interaction of the subject with the object or situation to be valued (Simmel 2004[1907]). Therefore, each individual develops perceptions and values about his or her surrounding reef environment based on their individual experiences and interactions. This undoubtedly means that one "true" value of reef resources as sought by quantitative approaches is impractical. Although individuals who lived in a community often develop shared norms, values and behaviours towards their surroundings there would still exist many differing values, even for the same resource. As demonstrated by the cases presented in this research, these values are not in a fixed state but are changing as people's social environment and interactions with the resource change. Multiple and changing values exist.

These changes do indeed show the complexity involved in a study of human value towards nature and the next to impossibility of finding one true value for the resource. Even those aiming to find a monetary value acknowledge the difficulty in finding a total economic value (Pagiola 2008; Reid and Boyd 2008). This does not mean that one should abandon inquiries in the area. These studies of local environmental values are important, especially as many of the interaction between the different natural environments occur between those who live in them. I believe the focus should not be to find one value but aim to understand the different values held by communities, how these values are prioritized, how the values have changed and what contributes to this change. In this section I explore further into the changing reef values by looking at the significance of (i) the changes to local resource management, (ii) the formation of worldviews regarding the local environment, (iii) the strengthening of social norms related to resource management, and (iv) the relationship between local and global environments.

6.4.1 Local Values and Locally Relevant Governance

The changing and differing values suggest that one overall management rule cannot be prescribed for all communities. The cases discussed show that even for similar resources, the management varied among the communities. For example, presently a common state rule governed the use of sand and coral, its implementation varied greatly in the different communities. This was mainly dependent on how the resources were used and valued. Those communities that understood and valued the protection given to the island by coral from the house reef and the sand on the beach were prompt in accepting and implementing the state rules. The communities where customary use is significantly important were much slower in their implementation of state rules. This can be seen in the examples of Communities A and B where sand is still taken for customary use. The community leaders are relying on gradual phasing out due to the difficulty in obtaining sand than through the implementation of state rules.

The use of scads is another example of how different management rules are used by the communities. Again these variations depended on the interaction of the communities with the scads. For example, the length of stay of scads in the lagoon and the frequency of their return. The communities which interacted more with scads had more local rules compared to those communities which had fewer interactions. It would be quite difficult to have those one size fits all rules for mobile resources such as scads.

In these examples, I observe that there are differences, some slight and some major, in how communities valued these reef resources. The physical and social characteristics of the communities, I found, were important factors that contribute to these differences in value. This suggests that individual communities cannot be viewed as homogeneous. Their individuality in terms of resource value has to be considered rather than imposing common rules for all communities. Considering the example of the state rules for sand and coral, it can be seen that local communities find their own way of implementation to fit the values of the community. The different ways communities manage the reef resources near the island show that communities are successful in resource governance, organizing themselves to conserve and or protect the resources they value. The communities of Kendhoo and Hulhudhoo are prime examples of taking initiative in regulating the mining of coral and sand respectively, when community members became aware of the impacts on the island.

In both examples the local consulting body, the IDC had effectively managed the use of the resources. The IDCs had been the consultative body voicing the views and concerns of the people and had been active in forming management rules for fish in the lagoon too. The importance that all community members feel towards the management of the resource is the reason why these rules were successful. This common need by the community and social norms play an important role in policing within the communities. The advising and reminding of rules when a child or other community member breaks the rules for catching scads is an example where each member takes responsibility for taking care of the resource. Such actions have the added benefit of teaching young children about the importance of the resource and thus transcending these values and associated behaviours.

As can be seen throughout the discussions in this thesis, values are always changing. Similarly the importance given to social norms and local governance has changed in the communities. Most elders believe the reason to be the breakdown of social ties and increase in individualistic behaviour. The elders believe this to be stemming from the introduction of the market realm. Others believe the reason to be increased political tensions and "awareness" of rules needing legitimacy. Many of the younger generation do not have the same respect for local rules as the earlier generations. For the younger generation rules need to be formalised to be real. I believe both these views are factors that have contributed to this change. The elders with their added years of observing and experiencing the social and natural environment have seen the slow eroding of social values through the spread of market exchanges. On the other hand, the younger generation with their more recent understandings point to this sudden political change in how rules are perceived.

As the Government of the Maldives is gearing towards decentralised governance, measures are being taken to establish and strengthen local level governance. As described in Chapter 1, the law on local governance enacted in 2010 has paved way to the establishment of formally recognized Island Councils for island level governance. It is notable, in relation to this research, that under the new law, local governance institutions are mandated with the power to form local rules. Just starting out at the infancy stage, the functioning of these institutes are undoubtedly hindered by the current political instability in the country. The recent elections for island councils show that members are elected depending on which political party has most support in the island. I find this of concern in island and resource governance as such political influence hinders representation of a variety of community members as in the case of the IDC. For example, I have observed that elders are rarely included in councils. Especially for the management of reef resources, it is important that elders and experienced people such as fishermen are included.

Despite these concerns, I believe this is a positive opportunity for reviving the traditional ways of forming local rules to address local issues in management of reef resources. This also is an opportunity to address the issue of legitimacy of local rules raised by younger generations. In order to ensure success of such initiatives understanding how resources are valued locally is of utmost importance.

6.4.2 Local Knowledge and Local Worldviews

I had embarked on this research with a predominantly globalised worldview and it is through this research that I have come to a realization that how local communities perceive their reef environment is very different to that which I was accustomed to. Examples of such difference in local and globalised worldviews have been well documented in literature (Jostad et al. 1996; Berkes 2012[1999]; Moran 2006). The seminal work on traditional ecological knowledge by Berkes (2012[1999]) demonstrates the importance of worldviews in resource management and its linkages to traditional ecological knowledge through a knowledge-practice-belief system (Figure 3-6). It is this knowledge-practice-belief system that I want to draw attention to in this section.

Worldviews influence how we make sense of our observations regarding the surrounding environment (Berkes 2012[1999]). As suggested by Jostad et al. (1996) the consideration of another worldview can change the way a problem or issue is perceived. In fact, what may be an issue in one worldview may not be in another. For example, fishermen from the communities do not perceive debris, whether thrown garbage or a storm uprooted tree, floating in the ocean as pollution but as a blessing as they know from experience and their knowledge about the local seas and behaviour of fish that they would usually find fish under it. As seen in this example, the local knowledge of community members contribute to how the environment is perceived and interpreted. Berkes (2012[1999], p.19) emphasises that different levels of analysis of TEK are in dynamic relationships and as such "[w]orldviews shape observations and social institutions but may themselves be affected by changes occurring at other levels ...".

My focus in this discussion is on the impact of local knowledge in forming our worldviews or belief systems regarding our surrounding environment. Earlier in this chapter I have discussed the changes to perceptions about the reef environment when present generations live away from the island communities. The changes are mainly arising due to the lowered day to day interactions and the growing globalised worldviews developed through the globalised schooling. One of the important effects that I believe needs to be addressed is the dilution of local knowledge possessed by present generations. As future educators, resource managers, local leaders and policy makers, it is important for the current generations to gain an understanding of the local worldview through gaining knowledge of the local environment and the interactions that communities have with it.

My intention in raising this issue is not to call for an abandonment of globalised education, as such knowledge is needed in today's globalised world. As pointed out by Saeed (2003) learning of the globalised worldview and its traditions should not be at the expense of negating our local worldview, history, customs and traditions. Education has been used to create new worldviews and environmental subjects and this seems an appropriate method of intervention to ensure passing of knowledge of our local environment to future generations.

The talk of education brings to mind an interaction I had with Shadiya and Rasheeda, two teenage girls from Thakandhoo who had, at a young age, migrated with their families to the capital. While walking we came across some locally abundant vines which produce an edible fruit. Always interested in wild foods, I was excited and started picking the fruits. Not familiar with the plant the two girls were impressed by my knowledge of local plants although I had grown up in the capital. They asked if I knew these things because I undertook environmental studies. I replied that I learnt these things by visiting islands from a young age. This led to a conversation where the girls talked of the difficulties they had in understanding the subject Environmental Science which is taught at their school. Shadiya also added that she found the subject very boring as she did not understand many of the topics. Their reasoning for the lack of understanding was that such subjects were for very smart people. I believe their difficulty in understanding and hence, the lack of interest is arising not from a lack in their intellectual capability[7] but a difficulty in relating to knowledge that they cannot experience in their current environment. Saeed (2003) points to such issues of learning in a foreign education system as the reason why over ninety percent of Maldivian youth leave school having failed. Perhaps there are many students like Shadiya and Rasheeda who may be more receptive to learning Environmental Science if things they could relate to were integrated into the curriculum.

In her work on local ways of knowing, Saeed (2003) emphasises the importance of learning about the local environment through locally relevant education. Although knowledge itself is important, I agree with Saeed that the process of learning or ways of knowing is equally if not more important. Traditionally knowledge has been passed down through the generations through stories, practice and observation.[8] For example, the almost forgotten tale of how the skipjack tuna was formed (Appendix 8), includes important knowledge about the fish, fishing in the communities and the beliefs of communities regarding these resources. I was fascinated by this account and listened with interest like a little child hearing a fairytale. I am sure such stories would capture the imagination of the younger children and also provide intriguing discussions from older children as ways of looking at the environment beyond the physical descriptions. Such ways of knowing bring with them a link to the communities, its history and culture. I have experienced these linkages through the many stories I heard from participants, or stories that are created by my interactions with them.

Here I recall one such story told by the island officials of Thakandhoo. In our discussion of fishing rituals, the Katheeb reminisced on how as a young boy in school he, with other children, had to collect flowers for using in the rituals to pray for an auspicious fishing season. The flowers are collected by the children and put in a large vat of water outside the mosque. Special prayers are said over the water and then used in the ritual. Children, through engagement in such activities learn much about the cultural practices and beliefs of the community. These practices with it include many lessons such as the importance of the resources to the community, being thankful for the resources, the linkages of the spiritual to the worldly affairs and community bonds. Such rituals are almost non-existent in today's fishing communities. Fishermen, of Addu, who are renowned fisherman

---

[7] The girls mentioned other subjects such as Mathematics that they really liked and did well at school.

[8] A comprehensive work on local ways of knowing can be found in the work by Saeed (2003). The examples in this work include oral traditions, learning through practice and observation among the ways of knowing.

stated that these things are not practiced anymore. Yet the historic importance of such things can be seen in the allocating of a fish share for the person who performs the prayers for a good fishing season.

As such practices do not exist now children who live on the islands also do not get to experience and learn from these. But these things can be narrated to the younger generations, in story form to remind them of the things we are slowly forgetting. School activities such as drama is an arena where children can learn of such stories. Perhaps it is a fitting arena for things, which are now considered nothing short of ancient superstition.

Knowing and locally relevant ways of knowing are important in the creation of local worldviews. These are important aspects of how we view our environment and interact with it, a knowledge-practice-belief systems. Through ensuring the continuity of our local knowledge we preserve our local worldviews. "Perhaps our contribution to global knowledge could have been through communicating knowledge that is created through our own unique lens of seeing the world as Maldivian people" (Saeed 2003, p.220).

6.4.3 Re-integrating the Sacred

Following from the previous section, here I will be focusing on the relation of resource management practices and local beliefs or worldviews, in the knowledge-practice-belief complex. A notable observation in the way resources were used and managed by earlier generations was that all interactions were governed by their traditional and social values and religious beliefs. Nature, culture and the spiritual are not sharply distinguished but "constitute a single system of entities not entirely separable from one another" (Redfield 2008, p.204).

In Maldivian communities, where Islamic beliefs guide the way of life, the belief that all creations belong to Allah and the role of humans is that of stewardship towards nature guides many resource use behaviours. Behaviours of using resources without wasting, sharing of resources in excess of need and being considerate of other resource users are all individual behaviours that are developed through these moral beliefs. In the Maldivian traditional belief system, the consideration in our behaviours extended from the community to all creations on earth including spiritual beings, *Jinns*, that co-exist with humans.

Jostad et al. (1996) describe similar views of stewardship towards nature by Native American tribes. "By assuming a respectful and humble place in the [Native American land ethic] system[9], respecting the system by using and not abusing it, by observing ritual and ceremony and giving thanks, the individual makes his actions benefit the individual, the tribe, and nature" (Jostad, McAvoy et al. 1996, p.574). In the example given by Jostad et al. (1996) the emphasis is given that it is individual behaviours that bring community benefit. These individual behaviours are guided by moral norms which ensure that harmony both with the natural and social world exist. Such an emphasis on community interest having precedence over individual interest is also given in environmental management under traditional Islamic Shariah (Khalid 2010).

I find it worrying that such integration of the sacred and secular are disappearing in today's communities. As discussed in Section 6.3.2, it is not only in resource management but in all aspects of life that this disappearance is occurring. In today's worldview, spirituality and religious beliefs are not compatible with the conception of "secular, rational, political 'man'" (Fonda 2011, p.3). This separation was quite apparent in my discussions where the idea of what is morally good is very similar in everyone's mind but its application is not visible in practice to situations such as resource management which now exists in the secular realm. For example, older fishermen often state that fishermen today "fish almost to empty the ocean at one go". In Hulhudhoo and Meedhoo, my visit coincided with a period of extremely poor fishing and all fishermen agreed that it was the way they had been taking bait that has caused disappearance of bait. Although they all agreed upon the cause no individual was prepared to stop the taking of bait in this way. I asked them why they keep doing this when they know the cause. The reply was, even if I stopped the other person would not, and he would continue to get benefits from fishing. Short term, individual benefit is given precedence over community benefit. Could a tragedy of the commons as suggested by Hardin (1968) be avoided by the fishermen bringing in the moral beliefs into their practices?

Perhaps some may view such ideas of bringing back the sacred as a step away from modernization. Resource managers have been looking to traditional forms of resource management systems for alternative ways of managing natural resources (Jostad et al. 1996; Berkes 2012[1999]). Dissatisfaction with the artificial divide between mind and nature and

---

[9] According to Jostad et al. (1996), Native American land ethic system comprise of four main beliefs; "All Is Sacred", "All Is Interrelated", "Mother Earth" and "Right Action".

the materialistic traditions in ecology, economics and resource management were seen as causes for the search for alternatives (Berkes 2012[1999]). I am in agreement with Berkes's (2012[1999], p.31) interpretation that the interest in TEK and management system is "a search for alternatives in human-environment relationships and in resource stewardship".

Perhaps, it is time that resource managers in the Maldives also focused on re-integrating the traditional worldview or beliefs into managing reef resources. This does not mean to halt development and revert to traditional ways of life but is an emphasis not to negate our cultural and traditional ways of knowing about and viewing our environment. As stated earlier, individual action and behaviours of "Right Action" are needed to bring about community benefits. In this sense the ideas of re-integrating the sacred need to be a thought at the individual level. Suzuki and McConnell (1997) advocate for this need for individuals to rediscover and live the spiritual connection to nature. Khalid also (2010) identify personal behaviour as the key to making changes for the benefit of the community. "Islamic environmentalism begins with the self and then radiates to the home, the school, the mosque and the wider community" (Khalid 2010, p.16). I believe, at the individual level, there is need to be concerned over the changes brought about by the separation of the sacred and secular in our interactions with both nature and other social actors.

6.4.4 Local Environments, Global Concerns

Local actions, repeated across communities, are often thought to have global impacts. Slogans such as "Act local, think global" are often used by environmental movements ranging from school environmental clubs to non-government organizations to national to international groups. The idea being that if everyone were to take appropriate actions a scaling up affect would contribute to the benefit of the national to regional to global environments. International environmental programmes and organizations as well as environmental conventions all demonstrate this global concern. Often such organizations focus on conducting environmental programmes at the regional or local levels. This demonstrates that although the concerns are at the global level the actions are often focused at the local level.

As the discussions from the case studies show, the changing reef values in the Maldives, especially among the younger generations, are more geared towards a global concern for the environment. In addition to living away from the reef environment, the globalised schooling have been identified as reasons for the creation of such environmental concern. In addition to the school curriculum, young children and youth are involved in many environmental programmes run by schools, governments and even by international organizations. Youth advocates or leaders are encouraged to participate in programmes run by international organizations. This reflects a form of environmentality where from a young age children are taught to be concerned for global environmental issues. In the midst of all this the local environment is mostly forgotten.

But, it is the local level that I believe is one, if not the most important point of view to understand when addressing global environmental issues. Environmental conservation programmes made by international organizations are ultimately implemented at the local levels. For example, the AEC Project in the Maldives is co-funded by the Global Environment Facility and implemented through the United Nations Development Programme. The actions of this project are carried out in local communities in Baa Atoll. Rather than local communities implementing projects formulated by those living outside the community, I believe, such programmes should try to understand how local communities perceive their environment, how they interact and manage it and how they value it. It is the already existing local management institutions that need to be understood by these global programmes and find ways to support the local institutes.

As the cases explored through this thesis shows, local communities have a strong interest in maintaining their surrounding reef resources. For example, in all communities there exist long standing local rules to ensure the continued stay of scads in the island lagoon. The initiative shown by the islands of Kendhoo and Hulhudhoo in banning the use of coral and sand respectively demonstrate that for both communities the protection that the resources provide to the island is valued over their use value. Having lived in the environment for generations, the communities have a strong understanding of the local environment, they understand it as a place of dwelling and as the basis of their livelihood. Traditional beliefs and norms together with the local knowledge guide the traditional local management institutions.

Reflecting back on these findings and issues discussed in this thesis, I find all the more reason to believe that this exploration of local values is of national as well as global significance. While global discussions raise the importance of local level participation in environmental programmes I do not find, in the case of the Maldives, that local concerns are meaningfully addressed. Many of the local level environmental programmes are usually carried out to fulfil commitments or obligations under global programmes. The former President of the Maldives, Maumoon Abdul Qayoom, is well known locally and in the international environmental arena for bringing to the attention of the world the perils faced by the Maldives from global warming and sea level rise. Since then, his successors have all followed in his footsteps regarding environmental issues. Perhaps these are ways that our leaders devise to put us on the map or they are ways of showing their altruistic self to the world.

I acknowledge that inclusion of local communities is identified as a priority in environmental management programmes both at national to global levels. Through this research, I identify and highlight the need for integration of the social environment into such management programmes. Presently much improvement in integrating the economical and ecological can be seen in the advancement of areas such as environmental valuation. This advancement needs to go beyond this to include the social as well. As such I believe, the way the term "environment" is used in environmental resource management needs to be redefined to incorporate both the natural and social environments. For example, I have grown up using the local Maldivian word *thimaaveshi*,- literally translated as my surrounding - and have always understood it to mean the natural or physical environment. This is the way the term is used and popularised by government as well as educational programmes. It is the way communities understand the word when I first used it in the field and I had to resort to avoiding the use of the term altogether to talk about the reefs. Through discussions with Abdulla Sodig, the person who coined the term, I have learnt that the original intended meaning of this word has long been forgotten and replaced with this idea of a global environment and the natural environment. The term *thimaaveshi* was originally created to describe the surroundings of a person, which includes both the natural and social environments. Thus, the term encompasses everything in a person's surrounding, the people, nature, the animate and the non-animate. This is the meaning I am advocating and suggesting to be revived.

Earlier in this chapter, I have stressed the importance of meaningfully addressing local perceptions and values through education, strengthening local resource governance and reintegrating the moral and spiritual beliefs in resource management. I believe that these issues discussed and areas that I have highlighted as needing to be addressed are not only relevant at the local level but apply to regional and national levels in the Maldives. I believe that management of local reef resources through the understanding and practices of local communities not only ensures conservation of the environment and its resources, but when repeated across localities would have much wider significance extending beyond the local to the national to the regional and the global.

These wider implications that go beyond the immediate research is what I find to be the most important aspect of the research process and findings. Hence, it is with these thoughts and ideas that I would like to part with the readers.

References

Acheson, J. M. (2006). "Institutional failure in resource management." Annual Review of Anthropology **35**: 117-134.

Acheson, J. M. and R. J. Gardener (2004). "Strategies, conflict, and the emergence of territoriality: the case of the marine lobster industry." American Anthropologist **106**(2): 269-307.

Acheson, J. M. and R. J. Gardner (2005). "Spatial strategies and territoriality in the Maine lobster industry." Rationality and Society **17**(3): 309-341.

Acheson, J. M. and J. A. Wilson (1996). "Order out of chaos - The case for parametric fisheries management." American Anthropologist **98**(3): 579-&.

Agrawal, A. (2001). "Common property institutions and sustainable governance of resources." World Development **29**(10): 1649-1672.

Agrawal, A. (2002). Common resources and institutional sustainability The Drama of the Commons. E. Ostrom, T. Dietz, N. Dolšaket al. Washington DC, National Academy Press**:** 41-85.

Agrawal, A. (2005a). "Environmentality: Community, intimate government, and the making of environmental subjects in Kumaon, India." Current Anthropology **46**(2): 161-190.

Agrawal, A. (2005b). Environmentality: Technologies of Government and the Making of Subjects. Durham NC, Duke University Press.

Allen, M.W., S.H. Ng and M. Wilson, (2002). "A functional approach to instrumental and terminal valuesand the value-attitude-behaviour system of consumer choice." European Journal of Marketing **36**(1/2): 111-135

Appadurai, A. (1986). Introduction: commodities and the politics of value. The Social Life of Things: Commodities in Cultural Perspective. A. Appadurai. Cambridge, Cambridge University Press**:** 3-63.

Aswani, S. and R. J. Hamilton (2004). "Integrating indigenous ecological knowledge and customary sea tenure with marine and social science for conservation of bumphead parrotfish (Bolbometopon muricatum) in the Roviana Lagoon, Solomon Islands." Environmental Conservation **31**(1): 69-83.

Aswani, S., P. Christie, N.A. Muthiga, R. Mahon, J.H. Primavera, L.A. Cramer, E.B. Barbier, E.F. Graenk, C.J. Kennedy, E. Wolanski and S. Hacker, (2012). "The way forward with ecosystem-based management in tropical contexts: Reconciling with existing management systems." Marine Policy **36**(1): 1-10.

Avineri, S. (1968). The Social and Political Thought of Karl Marx. Cambridge, Cambridge University Press.

Baland, J. and J. Platteau (1996). Halting Degradation of Natural Resources: Is There a Role for Rural Communities? . Oxford, Clarendon Press.

Barnhardt, R. and A. O. Kawagley (2005). "Indigenous knowledge systems and Alaska native ways of knowing." Anthropology & Education Quarterly **36**(1): 8-23.

Barrera-Bassols, N. and V. M. Toledo (2005). "Ethnoecology of the Yucatec Maya: Symbolism, knowledge and management of natural resources." Journal of Latin American Geography **4**(1): 9-41.

Barry, J. (2007). Environment and Social Theory. New York, Routledge.

Begossi, A. (1995). "Fishing Spots and Sea Tenure - Incipient Forms of Local-Management in Atlantic Forest Coastal Communities." Human Ecology **23**(3): 387-406.

Bengston, D. N. (1993). "Changing forest values and ecosystem management." Society & Natural Resources **7**: 515-533.

Bengston, D. N., T. J. Webb and D.P. Fan (2004). "Shifting forest value orientations in the United States, 1980-2001: A computer content analysis." Environmental Values **13**: 373-392.

Bentrupperbäumer, J. M., T. J. Day and J.P. Reser (2006). "Uses, meanings, and understandings of values in the environmental and protected area arena: A consideration of “World Heritage” values." Society & Natural Resources **19**(8): 723-741.

Berg, B. L. (2007). Qualitative Research Methods for the Social Sciences. Boston, Pearson Education Inc.

Berkes, F. (1998). Indigenous knowledge and resource management systems in the Canadian subarctic. Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience. F. Berkes and C. Folke. Cambridge, Cambridge University Press: 98-128.

Berkes, F. (1999). Sacred Ecology: Traditional Ecological Knowledge and Resource Management. Philadelphia, Taylor and Francis.

Berkes, F. (2012[1999]). Sacred Ecology. New York, Routledge.

Berkes, F. (2005). Commons theory for marine resource management in a complex world. Indigenous Use and Management of Marine Resources. N. Kishigami and J. M. Savelle. Osaka, The National Museum of Ethnology. **67:** 13-31.

Berkes, F., J. Colding and C. Folke (2000). "Rediscovery of traditional ecological knowledge as adaptive management." Ecological Applications **10**(5): 1251-1262.

Bess, R. (2010). "Maintaining a balance between resource utilisation and protection of the marine environment in New Zealand." Marine Policy **34**(3): 690-698.

Boldeman, L. (2007). The Cult of the Market: Economic Fundamentalism and its Discontents. Canberra, ANU E Press, Australian National University.

Bologh , R. W. (1979). Dialectical Phenomenology: Marx's Method. London, Routledge and Kegan Paul Ltd.

Bowen, G. A. (2008). "Naturalistic inquiry and the saturation concept: a research note." Qualitative Research **8**(1): 137-152.

Bromley, D. W. (1986). Closing comments at the conference on common property resource management. Proceedings of the Conference on Common Property Resource Management. N. R. Council. Washington DC, National Academy Press**:** 591-597.

Brown, G. G., P. Reed and C.C. Harris (2002). "Testing a place-based theory for environmental evaluation: an Alaska case study." Applied Geography **22**(1): 49-76.

Bruner, J. (1991). "The Narrative Construction of Reality." Critical Inquiry **18**(1): 1-21.

Butler, C. (2006). Historicizing indigenous knowledge: Practical and political issues. Traditional Ecological Knowledge and Natural Resource Management. C. R. Menzies. Lincoln and London, University of Nebraska Press**:** 107-126.

Burke, L., K. Reytar, M. Spalding and Perry A., (2011). Reefs at Risk Revisited, Washington DC, World Resource Institute.

Cafentzis, G. C. (2011). Immeasurable value?: An essay on Marx's legacy. Reading Negri: Marxism in the Age of Empire. P. Lamarche, D. Sherman and M. Rosenkrantz. Chicago, Open Court Publishing Company**:** 101-125.

Carsten, J. (1989). Cooking money: gender and the symbolic transformation of means of exchange in a Malay fishing community,. Money and the Morality of Exchange. J. Parry and M. Bloch. New York, Cambridge University Press**:** 117-141.

Cash, D. W. and S. C. Moser (2000). "Linking global and local scales: designing dynamic assessment and management processes." Global Environmental Change **10**(2): 109-120.

Cashdan, E. (1983). "Territoriality among human foragers: Ecological models and an application to four bushman groups." Current Anthropology **24**(1): 47-66.

Cepek, M. L. (2011). "Foucoult in the forest: Questioning environmentality in Amazonia." American Ethnologist **38**(3): 501-515.

Cesar, H. S. J. (2000). Coral reefs: their functions, threats and economic value. Collected Essays on the Economic Importance of Coral Reefs. H. S. J. Cesar. Sweden, CORDIO, Kalmar University**:** 14-39.

Chavez, C. (2008). "Conceptualizing from the inside: Advantages, complications, and demands on insider positionality." The Qualitative Report **13**(3): 474-494.

Cheal, D. J. (1988). The Gift Economy. London, Routledge.

Cinner, J.E. (2007). "Designing marine reserves to reflect local socioeconomic conditions: Lessons from long-enduring customary management." Coral Reefs **26**(4): 1035-1045

Cinner, J.E., M.J. Marnane and T.R. McClanahan (2005). "Conservation and community benefits from traditional coral reef management at Ahus Island, Papua New Guinea." Conservation Biology **19**(6): 1714-1723

Ciriacy-Wantrup, S. V. and R. C. Bishop (1975). "Common property as a concept in natural resources policy." Natural Resources Journal **15**(4): 713-727.

Clark, S. (2001). Coastal management and coastal-marine biodiversity report (draft). Male', Global Environment Facility / United Nations Development Programme**:** 109.

Cooper, D. R. and D. A. Clare (1981). "A Magnitude estimation scale for human values." Psychological Reports **49**: 431-438.

Cordell, H.K., M.A. Tarrant, B.L. McDonald and J.C. Bergstrom, J.C. (1998). "How the public views wilderness: More results from the USA survey on recreation and the environment." The International Journal of Wilderness **4**(3): 28-31.

Creswell, J. W. (1998). Qualitative Inquiry and Research Design : Choosing Among Five Traditions. Thousand Oaks, Sage Publications.

Cronon, W. (1995). The trouble with wilderness; or, getting back to the wrong nature. Uncommon Ground: Rethinking the Human Place in Nature. W. Cronon. New York, W.W. Norton & Co.**:** 69-90.

Davenport, M. A. (2003). Mixing Metaphors: A Community-based Vision for the Niobrara National Scenic River. Faculty of Graduate School, University of Minnesota. **Ph. D. :** 122.

De Groot, R. S. (1994). Environmental functions and the economic value of natural ecosystems. Investing in Natural Capital: The Ecological Economics Approach to Sustainability. M. A. Jansson, M. Hammer, C. Folke and R. Costanza. Washington DC, Island Press**:** 151-168.

Denzin, N. K. (2009). Qualitative Inquiry Under Fire: Toward a New Paradigm Dialogue. Walnut Creek, California, Left Coast Press, Inc.

Denzin, N. K. and Y. S. Lincoln (2005). Introduction: The discipline and practice of qualitative research. The Sage Handbook of Qualitative Research N. K. Denzin and Y. S. Lincoln. Thousand Oaks, Sage Publications**:** 1-32.

Dixon, J. A. (2008). Environmental Valuation: Challenges and Practices, A Personal View. Economics and Conservation in the Tropics: A Strategic Dialogue. San Francisco, Conservation Strategy Fund, Resources for the Future, and the Gordon and Betty Moore Foundation**:** 6.

Douai, A. (2009). "Value theory in ecological economics: The contribution of a political economy of wealth." Environmental Values **18**: 257-284.

Duriapph, A.K. (1998). "Poverty and environmental degradation: A review and analysis of the nexus." World Development **26**(12): 2169-2179.

Edossa, D.C., S.B. Awulachew, R.E. Namara, M.S. Babel and A.D. Gupta (2007). Indigenous systems of conflict resolution in Oromia, Ethiopia. Community-based Water Law and Water resource Management Reform in Developing Countries. B. van Koppen, M. Giordano and J. Butterworth, CABI: 146-157

Faruqi, Y. M. (2007). "Islamic view of nature and values: Could these be the answer to building bridges between modern science and Islamic science." International Education Journal **8**(2): 461-469.

Fonda, M. V. (2011). "Are they like us, yet? Some thoughts on why religious freedom remains elusive for Aboriginals in North America " The International Indigenous Policy Journal **2**: 1-15

Forbes, A. D. W. (1983). "the mosque in the Maldive Islands: A preliminary historical survey." Archipel **26**(26): 43-74.

Freidberg, S. (2001). "On the trail of the global green bean: methodological considerations in multi-site ethnography." Global Networks **1**(4): 353–368.

Fulton, D. C., M. J. Manfredo and J. Lipscomb (1996). "Wildlife value orientations: A conceptual and measurement approach." Human Dimensions of Wildlife **1**(2): 24-47.

Gamborg, C. and R. Fleming (2004). "Economic and Ecological Approaches to Assessing Forest Value in Managed Forests: Ethical Perspectives." Society & Natural Resources **17**: 799-815.

Gautam, A. P. and G. P. Shivakoti (2005). "Conditions for successful local collective action in forestry: Some evidence from the Hills of Nepal." Society & Natural Resources **18**(2): 153-171.

Gibson, C.C., J.T. Williams and E. Ostrom (2005). "Local Enforcement and Better Forests." World Development **33**(2): 273-284.

Giddens, A. (1990). The Consequences of Modernity. California, Stanford Unversity Press.

Ginn, F. (2008). "Extension, subversion, containment: eco-nationalism and (post)colonial nature in Aotearoa New Zealand." Transactions of the Institute of British Geographers **33**(3): 335-353.

Gombay, N. (2009). "Sharing or commoditising? A discussion of the socio-economic implications of Nunavik's Hunter Support Program." Polar Record **45**(2): 119-132.

Gombay, N. (2010). Making a Living: Place, Food, and Economy in an Inuit Community. Saskatoon, Purich Publishing Ltd.

Gordon, H. S. (1954). "The economic theory of a common property resource: the fishery." Journal of Political Economy **62**: 124-142.

Goudie, A. (2006). The Human Impact on the Natural Environment: Past, Present, and Future. Malden, Blackwell Publishing.

Gray, A. (1888). The Voyage of Francois Pyrad of Laval to the East Indies, the Maldives, The Molucas and Brazil. London, Hakluyt Society.

Griffith, D. (2006). Local knowlege, multiple livelihoods, and the use of natural and social resources in North Carolina. Traditional Ecological Knowledge and Natural Resource Management. C. R. Menzies. Lincoln, University of Nebraska Press**:** 153-174.

Gruen, L. (2002). "Refocusing environmental ethics: From intrinsic value to endorsable valuations." Philosophy & Geography **5**(2): 153-164.

Gudeman, S. (2001). The Anthropology of Economy. Massachusetts, Blackwell Publishers Ltd.

Gudeman, S. (2008). Economy's Tension: The DIalectics of Community and Market. New York, Berghahn Books.

Guha, R. and J. Martinez-Alier (1997). Varieties of Environmentalism: Essays North and South. London, Earthscan Publications Ltd.

Guyer, J. (2004). Marginal Gains: Monetary Transactions in Atlantic Africa. Chicago, University of Chicago Press.

Hall, E. T. (2001). Foreword. The Anatomy of Self: The Individual Versus Society. D. Takeo. Tokyo, Oxford University Press**:** 7-10.

Hallowell, A. I. (2002). Ojibwa ontology, behavior, and world view. Readings in Indigenous Religions. G. Harvey. London, Continuum International Publishing Group**:** 17-49.

Hannerz, U. (2003). "Being there ... and there ... and there!" Ethnography **4**(2): 201-216.

Haq, S. N. (2003). Islam and ecology: Toward retrieval and reconstruction. Islam and Ecology: A Bestowed Trust. R. C. Foltz, F. M. Denny and A. Baharuddin. Massachusetts, Center for the Study of World Religions, Harvard Divinity School: distributed by Harvard University Press**:** 121-154.

Harada, K. and G. P. Glasby (2000). "Human impact on the environment in Japan and New Zealand: A comparison." The Science of the Total Environment **263**: 79-90.

Hardin, G. (1968). "Tragedy of Commons." Science **162**(3859): 1243-1248.

Harkes, I. and I. Novaczek (2002). "Presence, performance, and institutional resilience of *sasi*, a traditional management institution in Central Maluku, Indonesia." Ocean & Coastal Management **45**: 237-260.

Harper, L. A. A. (2006). A multi-site ethnography exploring culture and power in post-secondary education partnerships. The Faculty of Gradute Studies (Educational Studies). Vancouver, University of British Columbia. **Ph.D.:** 188.

Hayami, Y. (2001). Development Economics: From the Poverty to the Wealth of Nations. Oxford, Oxford University Press.

Hearn, C. J. (2008). The Dynamics of Coastal Models. Cambridge, Cambridge University Press.

Helander-Renvall, E. (2010). "Animism, personhood and the nature of reality: Sami perspectives." Polar Record **46**(236): 44-56.

Hennink, M. M. (2008). Language and communication in cross-cultural qualitative research. Doing Cross-cultural Research: Ethical and Methodological Perspectives. P. Liamputtong. Dordretch, Springer**:** 21-33.

Hill, K. (2002). "Altruistic cooperation during foraging by the Ache, and the evolved human predisposition to cooperate." Human Nature - An Interdisciplinary Biosocial Perspective **13**(1): 105-128.

Hodgson, G. (1997). Economics, environmental policy and the transcendence of utilitarianism. Valuing Nature? Economics, Ethics and Environment. J. Foster. London, Routledge**:** 48-63.

Houghton, K. T. and R. Mendelsohn (1996). "An Economic Analysis of Multiple-Use Forestry in Nepal." Ambio **25**(3): 156-159.

Hunn, E.S., D.R. Johnson, P.N. Russell and T.F. Thornton (2003). "Huna Tlingit traditional environmental knowledge, conservation, and the management of a "wilderness" park." Current Anthropology **44**(S): S79-103.

Hunter, M. L. and J. P. Gibbs (2007). Fundamentals of Conservation Biology. Malden, Blackwell Publishing.

Ibrahim, S. (1989). "Oimathi fan elhun [Transliteration writer's own]." Rasain **9**: 76-84.

Idrus, M. R. (2009). Hard habits to break: Investigating coastal resource utilisations and management systems in Sulawesi, Indonesia. Department of Geography. Christchurch, University of Canterbury. **Ph.D.:** 239.

Ingold, T. (2000). The Perception of the Environment: Essays on Livelihood, Dwelling and Skill. New York, Routledge.

Ingold, T. (2011). Being Alive: Essays on Movement, Knowledge and Description. London, Routledge.

Irvine, H. and M. Gaffikin (2006). "Getting in, getting on and getting out: Reflections on a qualitative research project." Accounting, Auditing & Accountability Journal **19**(1): 115-145.

Jameel, A. (2007). A model to intergrate the management of hazards and disasters in the national sustainable development planning of the Maldives. Geological Sciences. Christchurch, University of Canterbury. **Masters:** 117.

Jenny, A., F.H. Fuentes, and H.J. Mosler (2007). "Psychological factors determining individual compliance with rules for common pool resource management: The case of a Cuban community sharing a solar energy system." Human Ecology **35**(2): 239–250

Johannes, R. E. (1978). "Traditional Marine Conservation Methods in Oceania and Their Demise." Annual Review of Ecology and Systematics **9**: 349-364.

Johannes, R. E. (1981). Words of the Lagoon: Fishing and Marine Lore in the Palau District of Micronesia California, University of California Press.

Johannes, R. E. (2002a). "Did indigenous conservation ethic exist." SPC Traditional Management Bulletin **14**: 3-7.

Johannes, R. E. (2002b). "The renaissance of community-based marine resource management in Oceania." Annual Review of Ecology and Systematics **33**: 317-340.

Johnson, M., Ed. (1992). LORE: Capturing Traditional Environmental Knowledge. Ottawa, Dene Cultural Institute and International Development Research Centre.

Jostad, P. M., L. H. McAvoy and D. McDonald (1996). "Native American land ethics: Implications for natural resource management " Society & Natural Resources **9**(6): 565-581.

Kennedy, E.H., T.M. Beckley, B.L. McFarlane and S. Nadeau. (2009). " Why We Don’t “Walk the Talk”: Understanding the Environmental Values/Behaviour Gap in Canada." Human Ecology Review **16**(2): 151-160.

Kennedy, J. J. and J. W. Thomas (1995). Managing natural resources as social value. A New Century for Natural Resources Management. R. L. Knight and S. F. Bates. Washington DC, Island Press**:** 311-321.

Khalid, F. M. (2002). Islam and the environment. Social and Economic Dimensions of Global Environmental Change. P. Timmerman. Chichester, John Wiley & Sons. **5:** 332-339.

Khalid, F. M. (2010). Islam and the environment: Ethics and practice. The 15th General Conference: The Environment in Islam. Amman, The Royal Aal al-Bayt Institute of Islamic Thought**:** 17.

Kopytoff, I. (1998[1986]). The cultural biography of things: Commoditization as process. Economic Anthropology. S. Gudeman. Chelternham, E.Elgar Publishing**:** 426-453.

Kondo, C., C. Saito, A. Deguchi, M. Hirayama and A. Acar (2010). "Social conformity and response bias revisited: The influence of "others" on Japanese respondents." Human Affairs **20**: 356-363.

Kumari, K. (1996). "Sustainable forest management: Myth or reality? Exploring the prospects for Malaysia." Ambio **25**(7): 459-467.

Langdon, S. J. (2006). Tidal pulse fishing: Selective traditional Tlingit salmon fishing techniques on the west coast of the Prince of Wales Archipelago. Traditional Ecological Knowledge and Natural Resource Management. C. R. Menzies. Lincoln, Nebraska Press**:** 21-46.

Latheefa, A., A. Jameel, M. Mohamed, L. Moosa and A.N. Mohamed (2005). State of the Environment: Maldives, 2004. Maldives, Ministry of Environment and Construction.

Leeson, P. T. and C. J. Coyne (2012 (forthcoming)). Conflict-Inhibiting Norms. Oxford Handbook of the Economics of Peace and Conflict. S. Skaperdas and M. R. Garfinkel, Oxford University Press.

Losey, R. (2010). "Animism as a means of exploring archaeological fishing structures on Willapa Bay, Washington, USA." Cambridge Archaeological Journal **20**(1): 17-32.

Madani, S., M. Ahmadian, M. KhaliliAraghi and F. Rahbar, (2012). "Estimating total economic value of coral reefs of Kish island (Persian Gulf)." International Journal of Environmental Research **6**(1): 51-60.

Madge, C. (1993). "Boundary disputes: Comments on Sidaway (1992)." Area **25**(3): 294-299.

Maloney, C. (n.d.). "Where did the Maldives people come from." Retrieved 5 September 2012 from http://www.iias.nl/iiasn/iiasn5/insouasi/maloney.html

Malinowski, B. (1960[1922]). Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea. New York, Dutton.

Maniku, H. A. (1990). Changes in the Topography of the Maldives. Male', Forum of Writers on Environment, Maldives.

Marcoux, J. S. (2009). "Escaping the Gift Economy." Journal of Consumer Research **36**(4): 671-685.

Marcus, G. E. (1995). "Ethnography in/of the world system: The emergence of multi-sited ethnography." Annual Review of Anthropology **24**: 95-117.

Marx, K. (1996[1867]). Capital: A Critique of Political Economy. Moscow, Progress Publishers.

Maurer, B. (2006). "The anthropology of money." Annual Review of Anthropology **35**: 15-36.

Mauss, M. (1966[1923]). The Gift: Forms and Functions of Exchange in Archaic Societies. London, Cohen & West Ltd.

McFarlane, B. L. and P. C. Boxall (2000). "Factors Influencing Forest Values and Attitudes of Two Stakeholder Groups: The Case of the Foothills Model Forest, Alberta, Canada." Society & Natural Resources **13**(7): 649-661.

McGrath, J. E. and B. A. Johnson (2003). Methodology makes meaning: How both qualitative and quantitative paradigms shape evidence and its interpretation. Qualitative Research in Psychology: Expanding Perspectives in Methodology and Design. P. M. Camic, J. E. Rhodes and L. Yardley. Washington DC, American Psychological Association**:** 31-48.

McLafferty, S. (1995). "Counting for women." Professional Geographer **47**(4): 436-442.

McLean, S. (2009). "Stories and Cosmogonies: Imagining Creativity Beyond “Nature” and “Culture”." Current Anthropology **24**(2): 213-245.

McShane, K. (2007). "Why environmental ethics shouldn't give up on intrinsic value." Environmental Ethics **29**(Spring): 44-61.

Mei, T. S. (2009). "The preeminence of use: Reevaluating the relation between use and exchange in Aristotle's economic thought." Journal of History of Philosophy **47**(4): 523-548.

Menger, C. (2009). The Origins of Money. Alabama, Ludwig von Mises Institute.

Meyer, J. M. (1997). "Gifford Pinchot, John Muir, and the Boundaries of Politics in American Thought." Polity **30**(2): 267-284.

Ministry of Planning and National Development (2007). Popoulation and Housing Census of Maldives 2006, Malé, Maldives

Ministry of Planning and National Development (2008). Analytical Report 2006: Popoulation and Housing Census 2006, Malé, Maldives

Ministry of Tourism Arts and Culture (2011). Tourism Year Book 2011, Malé, Maldives

Mohamed, M. (2007). Economic valuation of coral reefs: a case study of the costs and benefits of improved management of Dhigali Haa, a marine protected area in Baa Atoll, Maldives. Department of Economics & Department of Geography. Christchurch, New Zealand, University of Canterbury. **Masters:** 174.

Mohamed, M., A. Jameel, H. Abdulla, M. Inaz, A.A. Manik and S. Saeed. (2001). First National Communication to the United NAtions Convention on Climate Change (UNFCCC). Malé, Maldives, Ministry of Home Affairs, Housing and Environment.

Moran, E. F. (2006). People and Nature: An Introduction to Human Ecological Relations. Malden, Blackwell Publishing.

Moser, S. (2008). "Personality: a new positionality?" Area **40**(3): 383-392.

Murchison, J. M. (2010). Ethnography Essentials: Designing, Cinducting, and Presenting your Research. San Francisco, Jossey-Bass.

Nadasdy, P. (2003). Hunters and Bureaucrats: Power, Knowledge, and Aboriginal-State Relations in the Southwest Yukon. Vancouver, UBC Press.

Nadasdy, P. (2007). "The gift in the animal: The ontology of hunting and human-animal sociality." American Ethnologist **34**(1): 25-43.

Naeem, I., A. Rasheed, M. Zuhair and M. Riyaz. (1998). Coral Bleaching in the Maldives: Survey carried out in the North and South Malé Atolls, Malé Marine ResearchSection and Environment Research Unit

Naidoo, R. (2008). The Role of Economic Valuation in the Conservation of Tropical Nature. Economics and Conservation in the Tropics: A Strategic Dialogue. San Francisco, Conservation Strategy Fund, Resources for the Future, and the Gordon and Betty Moore Foundation**:** 6.

Naseer, A. (1997). Status of coral mining in the Maldives: Impacts and management options. Workshop on Integrated Reef Resources in the Maldives. D. J. Nickerson and M. H. Maniku. Malé, Bay of Bengal Programme. **Paper 5**.

Naseer, A. (2003). The integrated growth response of coral reefs to environmental forcing: morphometric analysis of coral reefs of the Maldives. Biology. Halifax, Nova Scotia, Dalhousie University. **Ph.D.:** 254.

Nashath, M. (2009). Environmental Studies 5. Malé, Education Development Centre.

Nilsson, J. and G. Hendrikse (2011). "*Gemeinschaft* and *Gesellschaft* in cooperatives." New Developments in the Theory of Networks, Contributions to Management Science **Part 3**: 339-352.

North, D. C. (1990). Institutions, Institutional Change and Economic Performance. Cambridge, Cambridge University Press.

Norton, B. G. and A. C. Steinemann (2001). "Environmental values and adaptive management." Environmental Values **10**: 473-506.

O'Brien, E. A. (2003). "Human values and their importance to the development of forestry policy in Britain: a literature review." Forestry **76**(1): 3-17.

O'Brien, E. A. (2006). "A Question of Value: What Do Trees and Forests Mean to People in Vermont?" Landscape Research **31**(3): 257-275.

O'Neill, J., A. Holland and A. Light (2008). Environmental Values. Oxon, Routledge.

Ostrom, E. (1990). Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge, Cambridge University Press.

Ostrom, E. (1999). "Self Governance and Forest Resources." Occasional Paper No.2. Retrieved 20 June 2008, 2008, from http://www.cifor.cgiar.org/publications/pdf_files/OccPapers/OP-20.pdf.

Ostrom, E. (2000). "Collective action and the evolution of social norms." Journal of Economic Perspectives **14**(3): 137-158.

Ostrom, E. (2006). Not Just One Best System: the Diversity of Institutions for Coping with the Commons Researching the Culture in Agri-Culture: Social Research for International Development. M. M. Cernea and A. H. Kassam. UK, CABI Publishing**:** 329-360.

Ostrom, E., J. Burger, C.B. Field, R.B. Norgaard and D. Policansky (1999). "Sustainability-Revisiting the commons: Local lessons, global challenges." Science **284**(5412): 278-282.

Ostrom, E. and E. Schlager (1996). The formation of property rights. Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment. S. Hanna, C. Folke and K. G. Mäler. Washington D.C., Island Press**:** 127-156.

Pagdee, A., Y. S. Kim and P.J. Daugherty (2006). "What makes community forest management successful: A meta-study from community forests throughout the world." Society & Natural Resources **19**(1): 33-52.

Pagiola, S. (2008). How useful is ecosystem valuation? Economics and Conservation in the Tropics: A Strategic Dialogue. San Francisco, Conservation Strategy Fund, Resources for the Future, and the Gordon and Betty Moore Foundation**:** 5.

Parry, J. P. and M. Bloch (1989). Introduction: Money and the morality of exchange. Money and the Morality of Exchange. J. P. Parry and M. Bloch. Cambridge, Cambridge University Press**:** 1-32.

Pearce, D., A. Markandya and E.B. Barbieer (1989). Blueprint for a Green Economy. UK Department of the Environment, London, Earthscan Publications ltd.

Phillimore, J. and L. Goodson (2004). Progress in qualitative research in tourism: Epistomology, ontology and methodology. Qualitative Research in Tourism: Ontologies, Epistemologies and Methodologies. J. Phillimore and L. Goodson. London, New York, Rooutledge**:** 3-29.

Polanyi, K. (1980[1944]). The Great Transformation: The Political and Economic Origins of Our Time. New York, Octagon Books.

Pollnac, R. B. and J. C. Johnson (2005). Folk management and conservation of marine resources: towards a theoretical and methodological assessment. Indigenous Use and Management of Marine Resources. N. Kishigami and J. M. Savelle. Osaka, The National Museum of Ethnology. **67:** 33-50.

Razee, H. (2006). 'Being a good woman': Suffering and distress through the voices of women in the Maldives. School of Public Health and Community Medicine. Sydney, University of New South Wales. **Ph.D.**

Ravnborg, H. M. (2003). "Poverty and Environmental Degradation in the Nicaraguan Hillsides." World Development **31**(11): 1933-1946.

Redfield, R. (2008). Social Anthropology. New Brunswick, Transaction Publishers.

Regmi, A. R. (2008). "Self governance in farmer-managed irrigation systems in Nepal." Journal of Developments in Sustainable Agriculture **3**(1): 20-27.

Reid, J. and J. Boyd (2008). Conference synthesis note. Economics and Conservation in the Tropics: A Strategic Dialogue. San Francisco, Conservation Strategy Fund, Resources for the Future, and the Gordon and Betty Moore Foundation**:** 14.

Reser, J. P. and J. M. Bentrupperbäumer (2005). "What and where are environmental values? Assessing the impacts of current diversity of use of 'environmental' and 'World Heritage' values." Journal of Environmental Psychology **25**: 125-146.

Riopelle, J. M. (1995). The Economic Valuation of Coral Reefs: A Case Study of West Lombok, Indonesia. Department of Economics. Halifax, Nova ScotiaHalifax, Nova Scotia, Dalhousie University. **Masters:** 74.

Rivas, P. R. M. (2008). Environmental and Social Values from Plantation Forests: A Study in New Zealand with Focus on the Hawke's Bay Region. Forestry. Christchurch, University of Canterbury. **Ph D:** 245.

Robinson, G. M. (1998). Methods and Techniques in Human Geography. Chichester, John Wiley & Sons Ltd.

Robst, J., S. Polachek and Y-C. Chang (2007). "Geographic proximity, trade, and international conflict/cooperation." Conflict Management and Peace Science **24**(1): 1-24.

Rodrigo, G. C. (2011). "The big and the small pipcture: Why economics is split into two realms." Finance & Development **48**(3): 42-43.

Rohan, M. J. (2000). "Arose by any name? The values construct." Personality and Social Psychology Review **4**(3): 255-277.

Rokeach, M. (1973). The Nature of Human Values. New York, The Free Press.

Ruddle, K. (1987). Administration and Conflict Management in Japanese Coastal Fisheries. FAO Fisheries Technical Paper No:273. Rome, Food and Agriculture Organization of the United Nations.

Ruddle, K. (1998a). "The context of policy design for existing community-based fisheries management systems in the Pacific Islands." Ocean & Coastal Management **40**(2-3): 105-126.

Ruddle, K. (1998b). "Traditional community-based coastal marine fisheries management in Viet Nam." Ocean & Coastal Management **40**(1): 1-22.

Rudel, T. K. (2011). "Local actions, global effects? Understanding the circumstances in which locally beneficial environmental actions cumulate to have global effects." Ecology and Society **16**(2): Article 19.

Ruitenbeek, H. J. (1992). "The rainforest supply price: a tool for evaluating rainforest conservation expenditures." Ecological Economics **6**(1): 57-78.

Saeed, S. (2003). Maldivian Ways of Knowing: an Inquiry into Cultural Knowledge Traditions and Implications for Schooling. Faculty of Graduate Studies. Vancouver, University of British Columbia. **Ph D:** 289.

Saeed, S. (2005). Social Capital and Well-being: Delving into the Deep Detriments of Sustainability. Canberra, The Australian National University. **PhD:** 374.

Sahlins, M. (1972). Stone Age Economics. Chicago, Aldine-Atherton.

Sale, J. E. M., L. H. Lohfeld and K. Brazil (2002). "Revisiting the quantitative-qualitative debate: Implications for mixed-methods research." Quality & Quantity **36**(1): 43-53.

Scheffer, M., F. Westley, W.A. Brock and M. Holmgren (2002). Dynamic interaction of societies and ecosystems - Linking theories from ecology, economy, and sociology. Panarchy: Understanding Transformations in Human and Natural Systems. L. H. Gunderson and C. S. Holling. Washington DC, Island Press**:** 195-239.

Schlager, E. (1994). Fishers' Institutional Responses to Common-Pool Resource Dilemmas. Rules, Games, and Common-Pool Resources. E. Ostrom, R. Gardner and J. Walker. Ann Arbor, Michigan, University of MIchigan Press**:** 247-265.

Schlager, E. and E. Ostrom (1992). "Property rights regimes and natural resources: a conceptual analysis." Land Economics **68**(3): 249-262.

Schlager, E., W. Blomquist and S.Y. Tang (1994). "Mobile flows, storage, and self-organized institutions for governing common-pool resources." Land Economics **70**(3): 294-317.

Schroeder, H. W. (1996). Ecology of the heart: Understanding how people experience natural environments. Natural Resource Management: The Human Dimension. A. W. Ewert. Boulder, CO, Westview Press**:** 13-27.

Schug, D. M. (1996). "International maritime boundaries and indigenous people: The case of the Torres Strait." Marine Policy **20**(3): 209-222.

Schultz, P. W. and L. Zelezny (1999). "Values as predictors of environmental attitudes: Evidence for consistency across 14 countries." Journal of Environmental Psychology **19**(3): 255-265.

Schwartz, S. H., Ed. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. Advances in Experimental Social Psychology, 25. New York, Academic Press.

Schwartz, S. H. (2006). "Basic human values: Theory, measurement, and applications." Revue française de sociologie.

Scott, A. D. (1955). "The fishery: The objectives of sole ownership." Journal of Political Economy **63**: 116-124.

Seedhee, B. (1995). Maamakunudhoo Bodu Easa Vaahaka [Transliteration Writer's Own]. Male', Maldives National Council for Linguistic and Historical Research

Seymour, E., A. Curtis, D. Pannell, C. Allan and A. Roberts (2010). "Understanding the role of assigned values in natural resource management." Australasian Journal of Environmental Management **17**(3): 142-153.

Shaig, A. (2006). Climate change vulnerability and adaptation assessment of the land and beaches of Maldives. Technical Papers to the Maldives National Adaptation Plan of Action for Climate Change. Malé, Ministry of Environment, Energy and Water**:** 22.

Simmel, G. (2004[1907]). The Philosophy of Money. London, Routledge.

Singleton, S. (1998). Constructing Cooperation: The evolution of Institutions of Comanagement. Michigan, University of Michigan Press ,Ann Arbor.

Smith, A. (2005[1776]). An Inquiry into the Nature and Causes of the Wealth of Nations. J. Manis. Hazleton, PA, Pennsylvania State University**:** 785.

Sosis, R., S. Feldstein and K. Hill (1998). "Bargaining theory and cooperative fishing participation on an Ifaluk Atoll." Human Nature - An Interdisciplinary Biosocial Perspective **9**: 163-203.

Spalding, M.D., C. Ravilious and E.P. Green. (2001). World Atlas of Coral Reefs. Berkley, USA, University of California Press.

Spurgeon, J. (1998). "The Socio-Economic Costs and Benefits of Coastal Habitat Rehabilitation and Creation." Marine Pollution Bulletin **37**(8-12): 373-382.

Stapp, W. B., D. Bennett, W. Bryan Jr., J. Fulton, J. MacGregor, P. Nowak, J. Swan, R. Wall and S. Havlick (1969). "The concept of environmental education." Journal of Environmental Education **1**(1): 30-31.

Starrett, D. A. (2003). Property rights, public goods and the environment. Handbook of Environmental Economics. K.-G. Mäler and J. R. Vincent. Amsterdam, Boston, Elsevier Science B.V. **1: Environmental Degradation and Institutional Responses:** 97-125.

Stern, P. C. and T. Dietz (1994). "The value basis of environmental concern." Journal of Social Issues **50**(3): 65-84.

Stern, P. C., T. Dietz and L. Kalof (1993). "Value orientations, gender and environmental concern " Environmental Behaviour **25**: 322-348.

Sultana, F. (2007) Reflexivity, positionality and participatory ethics: negotiating fieldwork dilemmas in international research. ACME: An International E-Journal for Critical Geographies **6**, 374-385

Suzuki, D. T. and A. McConnell (1997). The sacred balance: Rediscovering our place in nature. Vancouver, Greystone Books.

Tang, S. Y. (1991). "Institutional arrangements and the management of common-pool resources." Public Administration Review **51**(1): 42-51.

Tang, S. Y. (1992). Institutions and Collective Action: Self Governance in Irrigation Systems. San Francisco, ICS Press.

Temple, B. and A. Young (2004). "Qualitative research and translation dilemmas." Qualitative Research **4**(2): 161-178.

Thorburn, C. C. (2000). "Changing customary marine resource management practice and institutions: The case of sasi lola in the Kei Islands, Indonesia." World Development **28**(8): 1461-1479.

Toren, C. (1989). Drinking cash: The purification of money through ceremonial exchange in Fiji. Money and the Morality of Exchange. . J. Parry and M. Bloch. New York, Cambridge University Press**:** 142-164.

Tuan, Y.-F. (1974). Topophilia: A Study of Environmental Perception, Attitudes, and Value. New Jersey, Prentice-Hall.

Turner, N. J. and F. Berkes (2006). "Developing resource management and conservation." Human Ecology **34**(4): 475-478.

United Nations (2011). Rio+20 United Nations Conference on Sustainable Development, Available at: www.uncsd.org, Accessed on 25 May 2012.

United Nations Development Programme (2004). Project Document: Atoll ecosystem-based conservation of globally significant biological diversity in the Maldives' Baa Atol, United Nation Development Programme and the Government of Maldives: 179

United Nations Environment Programme (2010). http://coral.unep.ch/atlaspr.htm, accessed 4th September 2012.

Vargo, S. L., P. P. Maglio and M.A. Akaka (2008). "On value and value co-creation: A service systems and service logic perspective." European Management Journal **26**(3): 145– 152.

Vasquez, J. A. (1995). "Why do neighbors fight? Proximity, interaction or territoriality." Journal of peace research **32**(3): 277-293.

Wade, R. (1994[1988]). Village Republics: Economic Conditions for Collective Action in South India. San Francisco, ICS Press.

Watkins, L. (2010). "The cross-cultural appropriateness of survey-based value(s) research: A review of methodological issues and suggestion of alternative methodology." International Marketing Review **27**(6): 694-716.

Wildcat, D. R. (2009). Red Alert!: Saving the Planet with Indigenous Knowledge. Colorado, Fulcrum Publishing.

Wilkinson, S. (2004). Focus group research. Qualitative Research: Theory, Method and Practice. D. Silverman. London, Sage Publications**:** 177-199.

Willow, A. J. (2009). "Clear-Cutting and Colonialism: The Ethnopolitical Dynamics of Indigenous Environmental Activism in Northwestern Ontario." Ethnohistory **56**(1): 35–67.

Yandle, T. (2007). "Understanding the consequences of property rights mismatches: a case study of New Zealand's marine resources." Ecology and Society **12**(2): Article 27.

Younkins, E. W. (2005) Aristotle and Economics. Le Quebecois Libre

Zahra, A. and C. Ryan (2005). "Reflections on the research process: The researcher as actor and audience in the world of regional tourist organisations." Current Issues in Tourism **8**(1): 1-21.

Appendices

Appendix 1: Relevant State Level Laws and Regulations

Rules relating to sand and coral mining
Law 77/78: Law on mining coral, sand and rubble from inhabited islands
1992 Preliminary sand and coral mining regulations
2003 Regulations on mining coral, sand and coral rubble
Rules relating to fishing in lagoons
Law 5/87: Fisheries Law of the Maldives
1993 General fisheries regulation
Relevant over-arching rules
Law 4/93: Environment Protection and Preservation Act
Law 7/2010: Law on Decentralized Administrations of the Maldives
2011 Regulation on imposing fines and obtaining compensation for damage to the environmental
2012 Environment Impact Assessment Regulations

The above state rules are compiled from information available from relevant government agencies.

Appendix 2: A Brief Description of the AEC Project

The "Atoll Ecosystem Conservation" (AEC) project is initiated for the purpose of conservation and sustainable use of globally significant biological diversity in the Maldives' Baa Atoll. It is co-financed by the Global Environment Facility (GEF) and implemented through the United Nations Development Programme (UNDP). The project's three-pronged strategy is to:

1. Mainstream biodiversity conservation objectives into sectoral policies and programs and reinforce multi-sectoral institutional fora,
2. Conserve biodiversity "in the water" and "on the ground" by establishing protected areas and managing them through innovative national-local and public-private partnerships in Baa Atoll, and
3. Relieve livelihood-related pressure on biodiversity by enhancing reef fishery property rights and enabling local people to pursue more sustainable, alternative livelihoods.

The project seeks to strengthen commitment to biodiversity conservation in many ways, in particular by: a) including those directly affected by the condition of biological resources in the management of those resources by providing a means for stakeholders to participate in and have control over decision-making about biodiversity; b) strengthening reef resource property rights at the local level; and, c), creating a sense of equitable distribution of the benefits and costs of biodiversity conservation through the Baa Atoll Conservation Fund.

Appendix 3: Areas of Inquiry and Questions to Guide Field Interviews

Theme	**Topical Categories**	**Questions/Topics**
Community, livelihoods & reef resources	Use of reefs & its resources	1. Do you use the house reef surrounding this island for any purpose? 2. What uses do you make of the other reefs near the island/within the atoll? 3. Who among the community use these resources? (inquire on the different levels of use and interaction. E.g. those directly going to the reefs and accessing the resource, those involved in the processing of the resource once it is brought to the island, those consuming the end products of the resource)
	Accessing the resource	1. Who has access to the reefs? Can anybody go and use the reefs? 2. Are any particular reefs owned by any groups? E.g. reefs surrounding inhabited islands, resorts, protected areas 3. Can anybody be excluded for any reason? E.g. cannot fish in reefs of other atolls, for cultural reasons 4. How far do the people have to travel to access the reef resources? 5. What methods are used to access? E.g. types of boats? (Some questions in this part overlap with the topic of property rights under institutional dynamics)
	Consumption, distribution of fish in the community	1. How is the catch allocated/distributed among the fishermen? 2. Once the fish is caught what do you do with the catch? a. Do you sell them? If so to whom (other islands, own island, resorts, private buyers, others)? b. Do you consume at home among family? Do you share extra with other family members,

		friends or others in the island? c. Do you preserve and make other products, such as fish pate, smoked and dried fish, for home use and or for selling? 3. What are any noticeable changes in demand for fish and related products?
	Cultural significance	1. Are there any special/significant reefs in the local area? a. any areas fishermen/locals will not go for particular reasons? Why b. areas people visit for special purposes 2. Ask about stories associated with reefs or a particular reef. (I am thinking of asking this question in groups too)
	Social Homogeneity	(I would be observing general demographic characteristics within the island community as well as using information available in the island offices. In addition, I have listed some topics, based on current conditions in the Maldives, which might need further discussion with the community members) 1. Religious views within the community 2. political views 3. Power holdings within the community. Who influences decisions within the community? 4. Role of community development organisations. Are such groups working together or competing?
Local knowledge and ecological understanding	Knowledge on fishing grounds	1. How are the fishing spots identified & chosen? a. ecological knowledge of the fishes b. knowledge on the physical environment (currents, rainfall patterns) c. use of astronomical knowledge d. use of spiritual/magic practitioners (*fandita verin)* e. others 2. What are seasonal changes that are experienced?
	fishing practices	1. What methods are used for catching fish (Discuss on the technology and techniques used)

		2. Has there been any change over time in the practices used? A look at some of the earlier ways
	Availability of resource	1. How do you see the continued availability of resources from the reefs? Is there still plenty for everyone? Has there been a decrease in fishing yield? Or no change? 2. What is done to ensure that there is enough? Discuss conservation practices that may exist. E.g. rotation of fishing grounds, seasonal changes, allocation of no take areas, limiting size of fish caught and amount caught? (The aim of these questions is to see if there is a concern for resource diminishing. Do conscious or unintentional, conservation practices exist?
Institutional dynamics	Property rights & rules	(Access to particular reefs/ownership have been asked previously so here there will be more focus on use rights) 1. Are there other users in the reefs that you visit? Are they from the same island, other islands, other atolls, resorts & safaris? other countries? (Discuss relations with these groups) 2. Is there enough fish for everyone? Discuss if there are any rules understood & agreed by users? Who makes the rules? 3. discuss any issues arising over use of resources 4. How these are solved or are they solved? Who are involved in solving any issues?
	Local management rules	(Rules understood by users was asked earlier so here the focus is on other aspects such as the monitoring and enforcing of rules) 1. Who monitors if they obey these informal rules? Is there any reporting mechanism 2. What happens if people/groups don't obey these informal rules? Local penalties e.g. cutting of fishing nets & fish aggregating devices? Or other social

		shunnings?
	State/Government & formal rules	1. Discuss the formal/legal rules applied in the local area. (I will have reviewed the formal rules before going to the locations. This discussion will focus on their understanding, opinion of the rules, its monitoring and enforcement) 2. Discuss relationship with government a. Formation of rules and regulations & consultation with local community b. Proposed rules & regulations e.g. fishing quotas c. Support and resources available from the government d. other

Appendix 4: List of Participants

Name	Details
Abdul Raheem	Katheeb of Thakandhoo (official post)
Abdul Rahman	Island Councillor of Kendhoo (official post)
Abdul Samad Moosa	Retired Katheeb of Kendhoo (official post)
Abdulla Adam	Magistrate of Makunudhoo (official post)
Abdulla Hameed	Island Councillor of Makunudhoo (official post)
Abdulla Rasheed	Katheeb of Meedhoo (official post)
Abida	Woman, 60s, from Thakandhoo
Adeel	Man, 40s, from Hulhudhoo, self employed
Adnan Ali	Island Councillor of Thakandhoo (official post)
Afeefa	Woman, mid 50s, from Dharavandhoo, housewife
Afiyath	Woman, 40s, from Thakandhoo, lives outside the island
Afrah	Man, 30s, from Maarandhoo, from NGO
Ahmed Musthafa	Katheeb of Hulhudhoo (official post)
Ahmed Shafeeu	Katheeb of Hulhudhoo (official post)
Aiman	Man, early 30s, from Makunudhoo, self employed
Ali Anwar	Katheeb of Hulhudhoo (official post)
Alim	Man, early 40s, from Makunudhoo, employed on the island
Amaanee	Woman, early 50s, from Hulhudhoo, housewife
Ameen	Man, 80s, from Kendhoo, fisherman
Amir	Man, late 20s, from Dharavandhoo, employed on the island
Anees	Man, late 20s, from Kendhoo, employed on the island
Anwar	Man, early 50s, from Dharavandhoo, retired fisherman
Arif	Man, 40s, from Hulhudhoo, fisherman
Arifa	Woman, 60s, from Kendhoo, housewife
Asim	Man, early 50s, from Hulhudhoo, fisherman
Aslam	Man, late 40s, from Dharavandhoo, self-employed
Athifa	Woman, 60s, from Makunudhoo
Azeeza	Woman, late 30s, from Kendhoo, housewife
Bakuru	Man, late 40s, from Thakandhoo, sand miner
Easa	Man, 70s, from Maarandhoo, retired fisherman
Faaroog	Man, 40s, from Meedhoo, sand miner
Faheem	Man, late 40s, from Meedhoo, sand miner
Faiz	Man, late 50s, from Dharavandhoo, retired fisherman
Fareed	Man, 40s, from Thakandhoo, fisherman
Fareedha	Woman, mid 30s, from Kendhoo
Fathmath	Woman, early 30s, from Thakandhoo, lives outside the island
Fayaz	Man, mid 50s, from Hulhudhoo
Fazna	Woman, late 40s, from Dharavandhoo, employed on the island
Gafoor	Man, 70s, from Thakandhoo, retired fisherman
Gasim	Man, mid 30s, from Hulhudhoo, employed outside the island
Haleema	Woman, late 50s, from Dharavandhoo, housewife
Haneef	Man, 60s, from Dharavandhoo, retired fisherman
Hashim	Man, 80s, from Hulhudhoo, reef fisherman

Hassan	Man, 70s, from Thakandhoo, fisherman
Hawwa	Woman, late 60s, from Thakandhoo
Hilmy	Man, late 20s, from Dharavandhoo, employed on the island
Ibrahim Ahmed Didi	Man, 80s, from Meedhoo, local historian
Ibrahim Didi	Island Councillor of Hulhudhoo (official post)
Ibrahim Ismail	Kuda Katheeb of Makunudhoo (official post)
Ibrahim Rasheed	Kuda Katheeb of Thakandhoo (official post)
Ibrahim Shareef	Kuda Katheeb of Makunudhoo (official post)
Ibrahim Waheed	Katheeb of Maarandhoo (official post)
Idrees	Man, late 70s, from Kendhoo, retired fisherman
Ilyas	Man, 40s, from Kendhoo, fisherman
Inaz	Man, 40s, from Kendhoo, employed on the island
Iqbal	Man, late 40s, from Dharavandhoo, self-employed, earlier involved in many reef related activities
Ismail	Man, late 50s, from Dharavandhoo, retired fisherman
Jaufar	Man, 40s, from Thakandhoo, fisherman
Khadeeja	Woman, late 30s, from Kendhoo, housewife
Laila	Woman, 50s, from Makunudhoo
Latheef	Man, early 50s, from Dharavandhoo, grouper fisherman
Latheefa	Woman, 40s, from Hulhudhoo, self employed
Leena	Girl, teenager, from Kendhoo, just completed Year 10
Luthfee	Man, 50s, from Makunudhoo, fisherman
Mahmoodha	Woman, mid 40s, from Dharavandhoo, housewife
Manik	Man, late 40s, from Dharavandhoo, used to go fishing
Mansoor	Man, 30s, from Thakandhoo, employed outside the island
Mareena	Woman, 40s, from Kendhoo, process fish
Mareer	Man, 30s, from Makunudhoo, employed outside the island
Mariyam	Woman, mid 40s, from Dharavandhoo, housewife
Mohamed Fathuhee	Man, early 30s, from Dharavandhoo, island official
Mohamed Jameel	Bodu Katheeb of Hulhudhoo (official post)
Mohamed Naseer	Kuda Katheeb of Dharavandhoo (official post)
Mohamed Saeed	Katheeb of Kendhoo (official post)
Moosa	Man, late 40s, from Dharavandhoo, fisherman and sand miner
Mufeed	Man, early 40s, from Kendhoo, employed outside the island
Muhsin	Man, mid 50s, from Thakandhoo, not employed
Musthafa	Man, 30s, from Maarandhoo, from NGO
Naail	Man, late 30s, from Dharavandhoo, employed outside the island
Naasih	Man, mid 40s, from Hulhudhoo, fisherman
Nadeema	Woman, 50s, from Thakandhoo, employed on the island
Naeem	Man, 40s, from Thakandhoo, employed outside the island
Nafeesa	Woman, late 60s, from Dharavandhoo, housewife
Nafiz	Man, 40s, from Hulhudhoo, fisherman
Naseem	Man, late 50s, from Dharavandhoo, fisherman
Nazeera	Woman, late 30s, from Dharavandhoo, employed on the island
Nazim	Man, late 40s, from Makunudhoo, self employed
Niyaz	Man, late 50s, from Makunudhoo, fisherman
Nizar	Man, 70s, from Hulhudhoo, retired fisherman now employed on island

Nooh	Man, late 40s, from Thakandhoo, fisherman
Qadir	Man, early 70s, from Dharavandhoo, fisherman
Rafiu	Man, late 70s, from Kendhoo, self employed
Rahma	Woman, late 20s, from Dharavandhoo, employed on the island
Rahmaan	Man, late 30s, from Dharavandhoo, self employed
Ramiza	Woman, 40s, from Thakandhoo, housewife
Rasheed	Man, late 30s, from Dharavandhoo, employed outside the island
Rasheeda	Girl, teenager from Thakandhoo, student
Rauf	Man, 50s, from Makunudhoo, fisherman
Razeena	Woman, teenager, from Hulhudhoo, student
Riyaz	Man, late 30s, from Dharavandhoo, used to go fishing
Saeed	Man, early 40s, from Hulhudhoo, self employed
Sakeena	Woman, early 30s, from Dharavandhoo, lives in the capital
Saleem	Man, mid 40s, from Hulhudhoo, reef fisherman
Salwa	Woman, late 50s, from Dharavandhoo, housewife
Shadiya	Girl, teenager from Thakandhoo, student
Shafiu	Man, late 50s, from Kendhoo, employed on the island
Shaheedha	Woman, early 40s, from Dharavandhoo, employed on the island
Shahula	Woman, 40s, from Kendhoo, process fish
Shakir	Man, late 70s, from Hulhudhoo, retired fisherman
Shamha	Woman, teenager, from Kendhoo, student
Shamila	Woman, late 60s, from Thakandhoo
Shareef	Man, early 60s, from Kendhoo, fisherman
Shazna	Woman, 40s, from Kendhoo, self employed
Shiham	Man, mid 30s, from Dharavandhoo, employed outside the island
Sobira	Woman, late 50s, from Dharavandhoo, housewife
Sonia	Woman, 30s, from Makunudhoo, employed on the island
Sulaimaan	Man, mid 40s, from Kendhoo, self employed
Thaufeeg	Man, 40s, from Thakandhoo, reef fisherman
Umar	Man, early 50s, from Hulhudhoo, retired fisherman
Usman	Man, 40s, from Makunudhoo, fisherman
Wahaab	Man, 80s, from Thakandhoo, retired fisherman
Waheed	Man, 40s, from Kendhoo, fisherman
Wajeeh	Man, 40s, from Makunudhoo, fisherman
Yoosuf	Man, 30s, from Thakandhoo, employed outside the island
Yunus	Man, late 40s, from Kendhoo
Zahid	Man, 50s, from Thakandhoo, employed on the island
Zaid	Man, 30s, from Thakandhoo, employed outside the island
Zakariyya	Man, 50s, from Thakandhoo, retired
Zaki	Man, 20s, from Makunudhoo, employed outside the island
Zareer	Man, late 40s, from Kendhoo, employed on the island
Zoona	Woman, late 20s, from Thakandhoo, employed on the island
Zubair	Man, 70s, from Dharavandhoo, retired fisherman
Zuhudha	Woman, 40s, from Thakandhoo, lives outside the island
Zulfa	Woman, early 40s, from Hulhudhoo, housewife
Zunaira	Woman, late 70s, from Kendhoo

Appendix 5a: Information Sheet for Participants (English)

Information Sheet for Participants

(The information in this sheet will be shared orally with prospective participants before their participation.)

Information about the project and its aims

The name of the research project is "Analysing local institutions for management of reef resources". The main objective is to explore the importance of the local reefs and its resources to the local communities in the Maldives. I will be studying how the local communities use and manage the reef resources. I will also be looking at what factors affect the use and management of the resources. In addition I will be inquiring about how the management of the resources is regulated locally.

The work I am undertaking is not part of or for any agency in the Government of the Maldives but is for academic purposes as part of my doctoral studies at the University of Canterbury in New Zealand. The outcomes of this research will not be influenced by the Government or other external agencies but will be based on information generated by the participants and the researcher.

This research is being carried out under the main supervision of Dr. Nicole Gombay from the Department of Geography, University of Canterbury. She can be contacted by emailing nicole.gombay@canterbury.ac.nz or writing to University of Canterbury, Private Bag 4800, Christchurch, New Zealand. Alternatively, you can phone to +64-3-3642987. She would be happy to discuss any questions or concerns you might have regarding the research.

This research work has been reviewed and approved by the University of Canterbury Human Ethics Committee.

Participation and What is Involved

Members of the island community will be invited to participate in this research. Specific community members that I would like to talk with are community elders, fishermen, community leaders and development organisations. I would also like to get suggestions from the community on prospective participants. Any member who is interested in the research work would also be welcome to participate. Participation will be voluntary and participants can withdraw from participation whenever they want to. Any information they have shared can also be later withdrawn if later they feel the information should not be shared.

If a community member chooses to participate, they will take part in one or more interviews, either individually or in a group. The time and place of the interviews will be agreed in advance between all the participants, to suit all of us as much as possible. The interviews could last between half an hour to three hours and would depend on the amount of time the participant can spare. To help me in the analysis of the information generated, the interviews will be recorded on audio. But if any participant is not comfortable with the talks being recorded, the interview can be done without it being recorded.

The topics discussed in the interviews would relate to the reef resources around the island and how the community members use and manage them. The interview is not set to be formal but as an informal discussion where we can talk, share, know and learn from each other. The discussion would involve sharing their views and relative importance on statements about the reefs and their resources. Fishermen and other participants who know the physical reef systems may also be asked to draw, on a diagram, reefs which they make use of to get an indication of where and how far they travel to get the resources. Participants should be aware that they can choose to not share this information and if they do, it will be only viewed by me. Also these drawings will not be presented in any of publications or in any other form available to the public and will be destroyed after the analysis has been completed. More details on how the information will be used are given in the next section.

In addition, with permission from the community members, I would like participate in activities in the community. I will be recording my observation by taking field notes and also taking photographs. I will take photographs only after receiving consent from the participants. If anyone does not wish themselves or any private or sacred locations to be photographed, I will respect their wishes. Any photographs I may use in my thesis, any papers or presentation will be used only after receiving permission from the participants.

After completion of the interviews, I will give the participants the opportunity to check the recordings. I will provide a copy of the recording and if facilities and time permit I would also give a written transcript of the interview. This would give the participants an opportunity to reflect on the information they have shared and discuss with me if there are any changes they would like to make or parts of the interview that they would like to withdraw from the research. If anyone wishes to make any such chances, I would be happy to do so. I have provided you with my contact details for while I am in the field and also when I am back in New Zealand.

Participation and Confidentiality

Any information shared with the researcher will be kept confidential. All findings from this research will be presented as group findings. Names or identities of participants will not be revealed and the identities will not be linked to the information shared. False names that have no relation to the participant's real name will be used and any pictures that reveal the identity of any participant will not be used. If any member from the community wishes their identity to be made public this can be done only after gaining the required approval from the University of Canterbury Human Ethics Committee.

All information generated such as interview recordings, notes, pictures, during the fieldwork will be kept in a locked case in my room, which will remain locked when I'm not there. After the fieldwork, the information will be kept in a locked drawer in my office in my university. Any information stored on the computer will be password protected and I will not share the passwords with any others. I will be discussing the findings of this study with my supervisors and I will be using false names for the participants during the discussions. Any particular information that any participant has shared with special trust will not be shared with anyone else.

As mentioned earlier, any member can choose to withdraw from participation at any point. i.e. before, during or even after the participation. Details on how to contact me or my supervisors are given at the end of this information sheet and I will be giving these contact details to the participants.

How will the information generated be used?

The information will be analysed and presented as group results. Individuals will not be named and their identity will remain confidential. Any resource maps or other information that the community wishes to remain confidential will be used in my analysis but will not be used directly in my presentations. For example, locations of frequently visited fishing grounds will not be identified and presented.

This information will be used by me, Mizna to complete my doctoral thesis. Some of the information may also be published in journal articles and presented at conferences. On completion of my doctoral thesis or publication of journal articles the analysed findings will be available to any person or groups that may be interested. This may include the local communities participating in the research, other researchers and students, agencies within the Government of Maldives, such as

Ministry of Fisheries and Agriculture, Ministry for the Environment, working in resource management.

These publications will only be available as group findings and raw data will not be handed over to any other person or group, including the Government of the Maldives. Similarly, any information that participants do not wish to be known by the others will not be included in the findings.

After completion of my doctoral degree and returning to the Maldives, I would be going back to the communities to present my research findings. I would present the findings as a text document in Dhivehi, the local language. In addition, I would also make an oral presentation of the findings. I hope the findings of this research will be of some benefit to the participating communities. The findings may be useful as a tool for community responses to management decision regarding reef resources.

Contact details

If you want to ask anything or make any comments, now or in the future, please contact me.

During the fieldwork period (1st November to 15th February)

Mobile phone: 7947411

Email: mmo61@student.canterbury.ac.nz ; mizna.mohamed@gmail.com

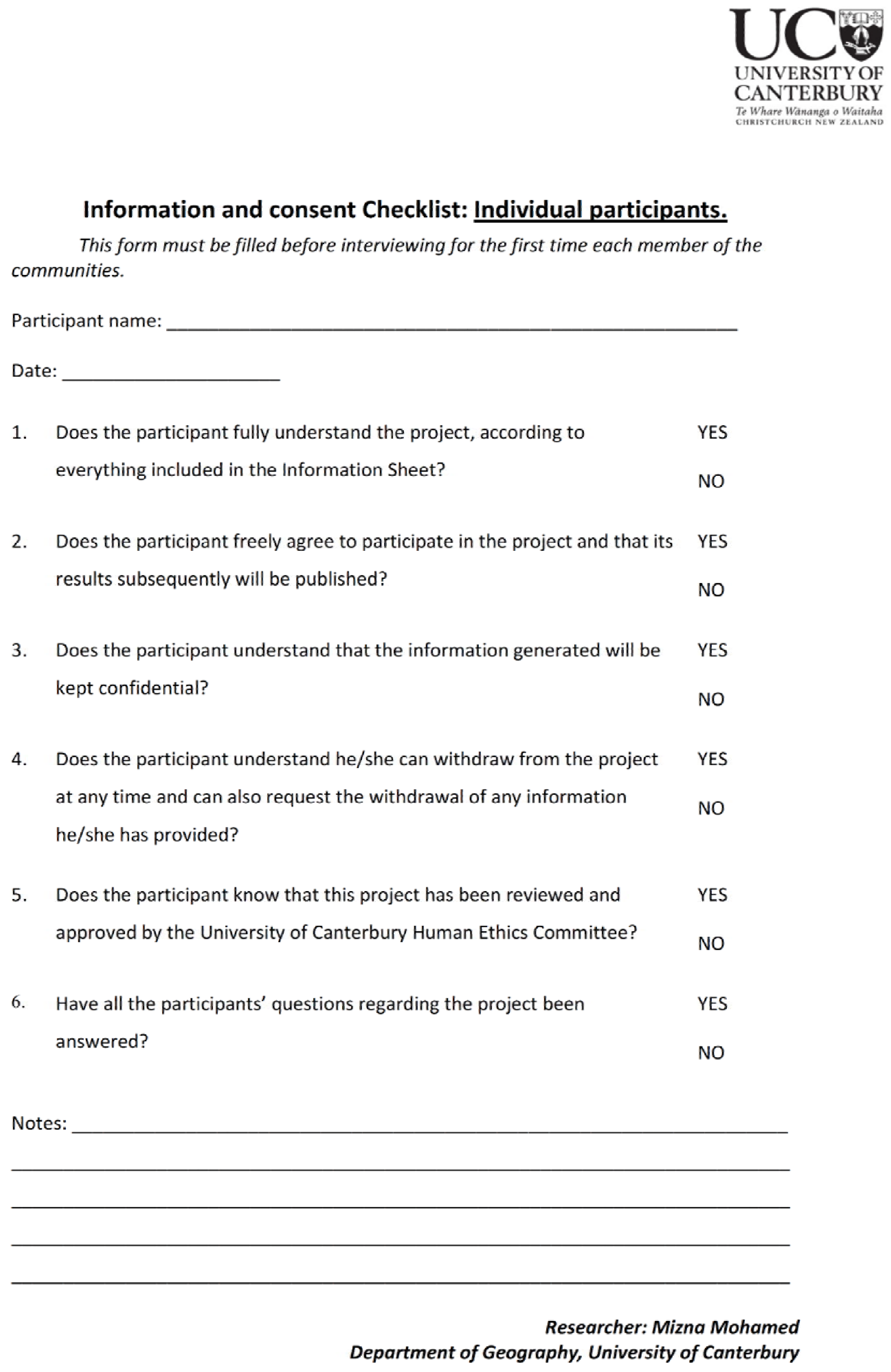
After the fieldwork period (after 15th February)

Mobile phone: 00 64 211061357

Phone: 006433548394

Email: mmo61@student.canterbury.ac.nz ; mizna.mohamed@gmail.com

Appendix 5b: Checklist for Informed Consent



Information and consent Checklist: <u>Individual participants.</u>

This form must be filled before interviewing for the first time each member of the communities.

Participant name: ____

Date: _______________________

1. Does the participant fully understand the project, according to everything included in the Information Sheet? YES NO

2. Does the participant freely agree to participate in the project and that its results subsequently will be published? YES NO

3. Does the participant understand that the information generated will be kept confidential? YES NO

4. Does the participant understand he/she can withdraw from the project at any time and can also request the withdrawal of any information he/she has provided? YES NO

5. Does the participant know that this project has been reviewed and approved by the University of Canterbury Human Ethics Committee? YES NO

6. Have all the participants' questions regarding the project been answered? YES NO

Notes: ____

____

____

____

____

Researcher: Mizna Mohamed
Department of Geography, University of Canterbury

Appendix 6: Positionality as the Researcher

From early childhood, as far back as I can remember, I have been taught the importance of knowledge. My first teacher was my grandmother who taught me to read the Arabic alphabet. This importance of knowledge instilled in me perhaps is the reason I am here writing this thesis. My learning process at home did not only include knowledge acquired through reading and writing. Other lessons on Islamic values and social norms were part of the learning process. Perhaps being raised by my grandmother is a reason that I identify myself today with many of the moral values and social norms that are characteristic of her generation. In the discussions of behaviours in the use and management of reef resources it would be quite easy for me to be sympathetic towards views of elders who find that many of the moral values are disappearing in today's society. Despite this, I have tried to listen objectively to the views of the different actors in the community. Having grown up in an extended family, with siblings and cousins, I have learnt that there are always many sides to a story and to be fair parents have to objectively listen to all of them.

I have been raised in a Muslim family and would consider myself as a moderate, practicing Muslim residing in the middle of the extremes described in Section 1.3.2. This puts me in a position where I can identify with many of the beliefs and customs in the communities. I would be bringing into the research and the analysis process these beliefs. For example, belief in the spiritual world of *Jinns* are part of Islamic beliefs which is shunned in the more modern world as irrational and unscientific. Nevertheless, I bring these contradictory beliefs into the research process.

Often in fieldwork gender is seen as role that affects the research process and being a Muslim woman there may be various assumptions on difficulties this may pose on the research process. Perhaps the reason that my gender did not pose any noticeable impacts may be that this research is done in the culture which I have grown up in. Reflecting on my childhood and to this point in life I cannot remember not being able to pursue something I wanted because of my gender. On the contrary, I have always felt especially loved and protected because of my gender. I have felt this same protection and being taken care of from my host families and community during my stay with them.

From the lessons learnt at home, I took the next step in being educated at a formal school. My education has been mainly in a globalised curriculum with English as the main mode of learning. As discussed by Saeed (2003), the education curriculum provided opportunities to learn more about the outside world than the local environment and local cultures. My interest in school were in a mixture of areas which included the physical sciences, mathematics and English literature which captured my love for reading. These learning experiences was the beginning of the formation of my predominant worldview regarding the environment, which is a globalised worldview. I say predominant because growing up in the Maldivian community I still had hold strong beliefs about our social customs and traditions and practices. Perhaps my worldview is a mix of the local and globalised for the many years I spent in globalised cultures would have added to how I perceive the world. A third of my life has been spent in Australia and New Zealand where I pursued tertiary education.

As mentioned earlier in this chapter, I had always been interested in my learning about the environment I grew up in and this proved to be the area in which I took up tertiary education. My initial study area was in the physical aspects of the ocean and reefs. My interest grew out of my interactions with the surrounding reef environments. As a child, during holidays, my parents would take me and my brother to picnics and local islands and we spent a lot of time swimming, snorkelling and on boat rides. As I lived in the city, such recreational use during holidays were my main form of interaction with the reefs. This is perhaps a reason why I had not initially understood the importance of reefs from the perspectives of those who interact with the it for everyday living.

Once completing my education, I worked in the Ministry of Environment in the Maldives and as described earlier it from my experiences there that my interest in the current research grew. Undoubtedly, my experiences and interactions with communities during my work would have created strong opinions and biases regarding the research. Most notably, these opinions are in the way that local environmental management existed merely on "paper". These views are also expressed in my Master's research work (Mohamed 2007). A more detailed description of the impacts of these views are discussed in Chapter 2 in the relevant section on positionality.

Although, I have worked in the government, this research is not undertaken in any capacity as a government official of the Maldives. As described in Chapter 2, I made my role as a student researcher very clear to the participants. While I gratefully acknowledge the financial and logistical support for the fieldwork from the AEC project, I would like to state that the research process, its findings and conclusions are independent from any influences from the AEC Project. All work presented in the thesis and any shortcomings it may contain are my own.

Appendix 7: Maakanaakaloa Vaahaka: The Story of the Crane

(An excerpt from Saeed 2003, pp161-162)

One day, one day there is a crane. This crane is there having pooped on a rock on the seashore. A wave comes and washes it. The crane asks where is the poop I pooped here. The wave says, "not knowing if it is yours or mine I have washed it. Shall I give you a poop or a wave". The crane asks for a wave. He carries the wave to a place where people are waiting for the tide to come in so they can catch bait. When he drops the wave and they catch bait, he asks where is the wave I dropped here. The people say, "not knowing if it is yours or ours, we have caught bait with it, shall we give you a wave or a bait". The crane chooses the bait.

He takes the bait and drops it where some fishermen are waiting unable to catch fish, as they didn't have bait. He dropped the bait there. The people caught fish with the bait. The crane comes and asks where is the bait I dropped here, and they say, "not knowing if it is your bait or our bait, we have caught fish with it, shall we give you a bait or a fish". The crane chooses the fish. He takes the fish to a place where people are bundling firewood. He drops the fish there and the people bake the fish and eat it. The crane asks where is the fish I dropped here. The wood gatherers say, " not knowing if it was yours or ours we ate it, shall we give you a fish or a bundle of wood". The crane asks for a bundle of wood.

He takes the bundle of wood and drops it at a place where people are cooking toddy with coconut leaves. They used the firewood to make toddy sugar. The crane comes and asks where is the bundle of wood I dropped here. They say, "not knowing if it is yours or ours, we used it to cook toddy sugar. Shall we give you a bundle of firewood or shall we give you a Thulha of toddy sugar". He asks for a Thulha of toddy sugar. The crane takes the toddy sugar to a place where people are baking rice cakes with plain water. The crane drops the toddy sugar there and the people bake rice cakes with the toddy sugar. The crane comes and asks where is the toddy sugar I dropped here. The people say, "not knowing if it is yours or ours, we have baked rice cakes with it. Shall we give you a Thulha of toddy sugar or shall we give you a rice cake". The crane asks for the rice cake.

As he flew with the rice cake the snatcher came and snatched the rice cake from the crane. The snatcher stuck the rice cake onto a wall. He put tooth marks on it and ate it. The crane got angry and asks where is my rice cake. The snatcher said I stuck it to a wall, put tooth marks on it and ate it. What can I give you in return? The crane asks for a drum. The crane takes the drum, sits on a rock and sings Koagandibey Rava Rava and that is the end of the story.

Appendix 8:The Story of the Skipjack Tuna

I first came across this story in one of my discussions about my research with friends who have heard their grandparents tell the story. Like many they did not know the whole story but remembered there was a story of how the skipjack tuna was formed from dough and later came to life. So, when I visited islands for research I inquired further about this story but, even among the experienced fishermen and elders, it was hard to find anyone who knew the whole story

The different bits from many people allowed me to construct this story. I feel especially fortunate to have met with Dr. Charles Anderson, a marine biologist who has lived and worked in the Maldives for over twenty five years. He was among the first people I met, outside the research communities, who knew this story and contributed to this version of the story. Dr. Anderson had, during many hours spent with fishermen, heard of this story and inquired further to find out about it. The narration below is based on the different versions of the story I have heard. The main story was very similar in all narrations with slight variations. These are pointed out in footnotes. The story of the skipjack tuna went as follows:

> *Once there was a young girl[1] who was playing with dough and made a fish out of it. She showed it to her father but her father was not happy that she made a life like image of a living being. He asked her to destroy it. The young girl could not bear to destroy it so she decided to put it into the sea. The fish came to life as it touched the water. As the fish slipped out of the girl's hands, her fingers made five lines on either side of the soft dough. According to the story, this is how the line- markings on the skipjack tuna came into being.*
>
> *Before the fish went away, the girl said to the tuna, "Go you and live in the sea. Grow and multiply in numbers. But I have one request of you. My people do not have much and are of poor means. Will you ask your children and children's children to allow themselves to be caught by my people for food."*

---

[1] Different versions varied on who this young girl was. All versions agree that she was the daughter of a leader in the community. Some versions tell of her as a princess, others say she was the daughter of a prophet. This latter version I believe may be a way of putting an Islamic spin to a local story. I inquired, with a Muslim scholar, on such a story originating from Islamic traditions but was told this kind of story could not be Islamic in origin. I would tend to agree more with the girl being a local princess.

> *The tuna agreed but said, "As you can see I am a magnificent fish. So I would like to be caught in a fitting way. Ask your people to catch me using a golden rod, a golden line and a golden hook."*
>
> *The girl replied that her people will not be able to afford such equipment and asked the tuna for an alternative. The tuna agreed to be caught by similar equipment but made of silver. Again the girl pleaded saying her people would not be able to find such things. So the tuna asked what the people could find to catch the tuna. The girl replied that they would be able to find a rod made from a local tree (onu), some bark (vaka) to make a line and an ordinary metal hook. The tuna finally agreed to be caught in this way. But it said, "Such a fish as I would be very embarrassed to be caught in this humble way. So ask your people to spray water into the school so that I would not be able to see this and at the same time I would not be seen being caught like this.*

This is the main story narrated to me by various people. I am not sure how closely this story follows the original story as such stories seem to be lost with the tradition of storytelling. The exchange between the girl and the tuna is symbolic of interaction between humans and the fish. We humans like the girl should allow tuna to grow in numbers and only catch what is needed. The tuna is allowing itself to be caught by the humans but in ways befitting the tuna. It gives directions for appropriate ways to catch tuna. This story also tells of how tuna is caught by the Maldivian communities. It is surprising to hear the story and see how little the methods of catching tuna has changed. The pole and line method continues to be practised by all tuna fishermen. The spraying of water into the school of tuna is still continued.