KEY DETERMINANTS OF STAKEHOLDERS' RESPONSE TO ENVIRONMENTAL ISSUES IN THE MALDIVES

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THESIS ABSTRACT

Environmental issues such as climate change, waste and pollution have been frequently discussed and debated among experts and practitioners, and in the world media. Small Island Developing States (SIDS) have been recognised as being environmentally vulnerable because they tend to have a small set of resources and have delicate fragile land and marine eco-systems and a relatively high vulnerability to natural disasters. However, insufficient attention at all sector levels in SIDS has been given to stakeholders' perspectives about what affects their responses to environmental issues. This thesis presents an investigation of the determinants of responses to environmental issues in a SIDS country.

A single-embedded case study was developed to study the Maldives. It included analysis of policy and institutional documents produced by the Maldives government, international organisations, third/voluntary sector and the private sector with a presence or role in the Maldives. Semi-structured interviews were conducted with primary stakeholders consisting of government officials, representatives from international organisations, private sector organisations, trade associations, third/voluntary sector organisations and local community leaders with a presence or role in the Maldives.

The findings of the study revealed that Government Motivation is the key determinant in influencing the ability of stakeholders in the Maldives to respond to environmental issues which concern them most, (e.g. climate change, disaster risk, and waste management). A number of problems emerged due to insufficient government motivation: political corruption; lack of stakeholder awareness and education; human resource situation; lack of stakeholder communication; lack of stakeholder motivation; lack of transparency and accountability and lack of appropriate fiscal and monetary action. These issues influenced and were affected by a number of capacity issues: awareness/education; technology; communication/network of interaction; human resources; including institutional structure and financial Issues.

The study contributes the perspectives of stakeholders in the Maldives to the wider debates about environmental issues in SIDs.

LIST OF ABBREVIATIONS

A	Aerosol Forcing
AIMS	Africa, Indian Ocean, Mediterranean and South China Sea
AOSIS	Alliance of Small Island States
BATS	Bermuda Atlantic Time Series Study
BPOA	BARBADOS PROGRAMME OF ACTION
CA	Capabilities Approach
CAQDAS	Computer assisted qualitative data analysis software
CBTF	Capacity Building Task Force
CC	Climate Change
CI	Capacity Issues
CICERO	Centre for International Climate and Environmental Research, Oslo
COP	Conference Of Parties
CVA	Capacities Vulnerabilities Analysis
DAT	Deliberate Alternative Tourism
DC	Developing Countries
DFO	Diesel Fuel Oil
DR	Disaster Risk
EF	Ecological Footprint
EIA	Environmental Impact Assessment
EIT	Economies in Transition
EKT	Ekalesia Kelisiano Tuvalu
ESTOC	European Station for Time Series in the Ocean
EU	European Union
FDI	Foreign Direct Investment
GEF	Global Environmental Facility
GHG	Green House Gas
GSP	Generalised Systems Preferences
HDI	Human Development Index
HOTS	Hawaii Ocean Time Series
ICAO	International Civil Aviation Organisation
ICRG	International Country Risk Guide
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
ISDR	International Strategy for Disaster Reduction
KWIC	Key Words in Context
LDC	Least Developing Country
LLDC	Landlocked developing countries
MCHE	Maldives College of Higher Education
MDGs	Millennium Development Goals
MEA	Multilateral Environment Agreements
MIRAB	Migration Remittances/Aid Bureaucracy
MRV	Measurable Reportable Verifiable

MSV	Many Strong Voices
NAMAs	Nationally Appropriate Mitigation Actions
NAPA	National Adaptation Programme of Action
NCSA	National Capacity Self-Assessment
NGOs	Non-Governmental organisations
NMHs	National Meteorological and Hydrological Services
PAR	Participatory Action Research
PEACESAT	Pan-Pacific Education and Communication Experiments by Satellite
PPMV	Parts Per Million by Volume
PROFIT	People Considerations, Resource Management, Overseas Engagement, Finance, Insurance, Taxation and Transportation
PV	PhotoVoltaic
PVC	Pro-Vention Consortium
PVT	Photo Voice Technique
RF	Radiative Forcing
RETs	Renewable Energy Technologies
SBI	Subsidiary Body for Implementation
SIDs	Small Island Developing States
SITES	Small Island Tourism Economies
SLD	Shared Learning Dialogue
SLR	Sea Level Rise
SMT	Sustainable Mass Tourism
ST	Sustainable Tourism
TEK	Traditional Ecological Knowledge
TPI	Tourism Penetration Index
TSA	Tourism Satellite Accounting
TuCAN	Tuvaluan Climate Action Network
UMT	Unsustainable Mass Tourism
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCC	United Nations Framework Convention on Climate Change
UNWTO	United Nations World Tourism Organisation
VCA	Vulnerabilities Capacities Analysis
VI	Vulnerability Index
WM	Waste Management
WMO	World Meteorological Organisation
WTO	World Trade Organisation
WTTC	World Tourism Travel Council

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DECLARATION

I declare that the research contained in this thesis, unless otherwise formally indicated within the text, is the original work of the author. The thesis has not been previously submitted to this or any other university for a degree, and does not incorporate any material already submitted for a degree.

Signed: _____

Dated: _____

CHAPTER 1 - INTRODUCTION

1.1 THE RATIONALE OF THE RESEARCH

Since the 1992 RIO SUMMIT, the special case of island countries was codified in Agenda 21, meaning that the agenda reflected a global consensus and political commitment at the highest level on development and environment cooperation; further, Small Island Developing States (referred to as SIDS) were a special case within this concept. SIDS may differ in terms of size, population, topography and income per capita but they still have unique vulnerabilities and characteristics in the pursuit of sustainable development. Being small is not necessarily a disadvantage, but some SIDS are constrained by their physical and spatial environments. SIDS are more vulnerable due to specific phenomena of certain magnitudes such as natural disasters, which impact on their economic, social, ecological and environmental profiles of SIDS over time.

A high number of SIDS have a reliance on tourism; these are also known as Small Island Tourism Economies (SITES) (McElroy, 2003). The dependency on tourism and their unique physical characteristics make them very vulnerable to external environmental events such as climate change and extreme weather due to the impact on their natural assets upon which SIDS depend.

Climate change and non-climate change environmental issues have been frequently discussed and debated in the world media and have become popular topics of discourse. Climate change specifically has received particular attention due to the negative consequences such as extreme weather events, flooding, droughts, erosion and sea level rise. These negative consequences are perceived to undermine people's livelihoods and are seen as a threat. Flat island nations could potentially lose their entire nation territories due to sea level rise; this could necessitate migration of the whole population of a nation state.

Climate change and its impacts are multifaceted phenomena which comprise the perceptions, values and knowledge, resources, power, and politics of many different stakeholders. Thus it is becoming increasingly obvious that stakeholders within, and associated with, SIDS must implement strategies that will deal with the environmental issues that they face. Strategies most common to SIDS are capacity building, adaptation and mitigation. Other possible strategies, however, face limits and barriers. Because SIDS face

such significant threats to their viability, it is imperative that an understanding of the limits and barriers to action is developed, and that relationships influencing action are understood in order for corrective measures to be taken.

Furthermore, the lack of extensive stakeholder engagement in relation to environmental issues in a given context also reduces understanding of what affects their abilities to respond to environmental issues.

1.2 RESEARCH QUESTIONS

There are four research questions which this study employed before developing the research aim and objectives; the research questions were used as a tool to guide the examination of the literature.

Research Questions:

1) What are the characteristics of SIDS?
2) What are the environmental issues they face - both climate change- and non-climate change-related?
3) What constraints and barriers have they faced when responding to environmental issues?
4) What are the knowledge gaps in the factors that influence stakeholders when responding to environmental issues?

Following the examination of the literature in chapters two, three and four the research aim and objectives were formulated from the findings of the literature review.

1.3 RESEARCH AIM AND OBJECTIVES

The aim of this study is to identify what affects stakeholders' ability to respond to environmental issues in a Small Island Developing State.

In order to achieve this, three research objectives have been set out. These are:

1. To undertake an analysis of policy and institutional documents (chosen due to their congruence with the key themes identified in the literature review), produced by the

government and by organisations with a presence or role in an individual SIDS, in order to identify the key environmentally-related themes and issues.

2. To use the identified key themes and issues to construct interview questions that aim to reveal stakeholder perceptions, knowledge, values and responses in relation to these key issues. Use these interview questions to interview key stakeholders.

3. To analyse policy and institutional documents and interview responses, in order to examine what central factor(s) affects stakeholders' ability to respond to environmental issues in an individual SIDS.

1.4 CONTEXT OF THE RESEARCH: THE MALDIVES

The origin of the first settlers in the Maldives still remains unknown. The Maldivian language is said to be Indo-Aryan with various other influences, especially from Sinhalese, but also from Tamil, Sanskrit, Persian, Urdhu and Arabic languages, suggesting that settlers may have come from a number of locations (Fritz 2002). Based on archaeological findings, it is believed that Hinduism existed in the Maldives before Buddhism was practiced in the islands. However, by the 12th century the country had converted to Islam due to the increased influence of, and interaction with, Islamic traders and travellers; the latters interest in the Maldives is thought to be because it was a significant source of cowrie shells, which historically was used as a currency throughout the Arab peninsula and parts of the east Africa (Hogendorn and Marion 1986).

During the 16th century the Portuguese attempted to establish a foothold in the Maldives, but they were eventually driven out. The Dutch later established a presence in the region, however, they were soon replaced by the British in the latter part of the 18th century. With increasing British Naval influence in the region, Britain's role as the protector of the Maldives was formalised in an 1887 treaty (BBC 2013). In 1953, the First Republic was established and replaced by the sultanate. In 1965 Maldives was granted independence by the British and by 1968 the Second Republic was formed. In August 2008, a new constitution was ratified, which led to the country's first multi-party presidential election.

The Maldives is located in the Indian Ocean, south-southwest of India. It lies between Minicoy Island (the southernmost part of Lakshadweep, India) and the Chagos archipelago. The Maldives rests on a submarine ridge that rises from the Indian Ocean along with Lakshadweep and the Chagos archipelago.

FIGURE 1.1: Map of the Maldives. (Source: BTA 2013, Online)

The Maldives has a very unique geography. It consists of over 1,100 coral islands, with about 192 of these inhabited. The islands are dispersed over approximately 35,000 square miles (FAO 2008), and have an average elevation of just 1.5 metres above sea level – making it the lowest country in the world. These islands are grouped into a double chain of 26 atolls. For administrative purposes, the Maldives government has organised these atolls into 19 administrative divisions and 2 cities. The atolls consist of a large, ring-shaped coral reef supporting numerous small islands. Some of the larger atolls are approximately 30 miles long from north to south, and can be wide as 19 miles from east to west, but no Individual Island is longer than 5 miles.

The islands are highly variable, with no two being even remotely similar. The topography of the islands is often determined by wind and wave action; some areas may be higher due to the accumulation of sand and gravel, and in other areas the beach may be eroded up to the line of vegetation. None of the islands have hills, but some have dunes, small lakes and/or marshes. Uninhabited islands' are often covered in bushes and coconut trees, and may have mangroves growing along the waterline. In addition to this vegetation, inhabited islands often also contain banana, papaya, mango, breadfruit and citrus trees, and other plants planted by families for personal consumption and for selling if grown in sufficient quantities. The soil quality is often poor and deficient in nitrogenous nutrients and micronutrients, particularly iron, manganese and zinc (FAO 2008), and is being further diminished by increasing salinisation of the water lens of islands; this adversely affects agricultural productivity. Moreover, as populations grow the land area available for growing food diminishes, leading to increasing food insecurity.

The temperature of the Maldives ranges from 25°C to 32°C, with a relatively high humidity of 73% to 85% (FAO 2008). There are two seasons: the dry season, which is associated with the northeast monsoon (November to March), and the rainy season, brought in by the southwest monsoon (April to October). The annual average rainfall is 1,890 mm; however, the rainfall in the southern atolls is greater, with an annual average of 3,050 mm, whereas in the northern atolls, annual rainfall is only 1,520 mm (FAO, 2008). The weather patterns of the Maldives do not always conform to the monsoon patterns of south Asia, and it is generally outside the main tropical cyclone area; however, during the south-west monsoon

season, strong winds and storms sometimes hit the archipelago and can cause severe damage.

The Maldives' geographical location and structure makes it highly vulnerable to environmental pressures and shocks. Similar to some other SIDS, the low-lying atolls of the Maldives are at the mercy of the impacts of increasing ocean temperatures namely the El Nino weather system, which has resulted in the bleaching and death of coral over the past 25 years and changing migratory patterns of tuna fish. The islands also suffer from beach erosion, storm surges, flooding and unpredictable rainfall – over recent years, the onset of both the dry and the wet season have become increasingly unpredictable – resulting in water shortages on local islands. The country has also experienced severe natural disasters, such as the violent monsoon winds in May 1991, which created tidal waves that damaged thousands of houses and piers, flooded arable land, uprooted thousands of fruit trees, and caused US$30 million worth of damage (FAO 2008). In addition, the 2004 tsunami severely damaged a number of local islands, resulting in the migration of some of the population to neighbouring or 'safe' islands, and significantly damaged a number of tourist resorts and the tourism industry infrastructure, which affected demand and revenues in the short term.

The Maldives is a democratic republic with a presidential representative, whereby the president is the head of government. Although the government have executive powers, each member of the cabinet is chosen by the president through parliamentary approval. The people's Majlis (parliament) is the main legislature body of the Maldives it is composed of 77 members who represent administrative localities of the country, some also represent a political party and others are independent. Decentralisation powers in the new 2008 constitution resulted in atoll councils being given the authority to administer each atoll and an island council to administer each inhabited island. Island councillors are elected by the people of each island, and the atoll councillors are elected by the island councillors. The Maldivian legal system is developed mainly from traditional Islamic law; there is a Supreme Court which consists of 5 judges as well as a high court, criminal court, civil court and local atoll and island level courts. The chief justice is appointed by the president with the recommendation of the judicial service commission and with the consent of parliament. The political framework of the Maldives enables the parliament to wield significant power

and influence over political decisions. This has developed a culture of buying votes, essentially political parties providing financial incentives for MPs to join them and therefore vote in accordance with their goals. Furthermore, the expanding number of MPs and councillors with high salaries and expenses has put a significant burden on government finances.

The Maldives currently has a population of 338,400 (World Bank 2013a), of which, 100,000 live in the capital, Malé – a 2 square-mile island located at the southern edge of north Malé atoll, and so with a very high population density. The reason for nearly 30% of the population living in Male' has been due to a number of reasons such as access to healthcare, higher education, jobs and because of family ties.

In 2012, the GDP of the Maldives was US$2.22 billion, with an inflation rate of 11.2% (World Bank 2013). Average GNP per capita is reportedly US$5,750 (World Bank 2013a). Although the Maldives has a relatively higher income per capita than some of its neighbours the high cost of living has had an impact on quality of life especially for those living in the capital, with very high rents, high costs of utilities and high costs of food including fish. Changing oil prices has caused inflationary pressures in the country because the Maldives is dependent on the import of diesel to power the economy. The Maldives' currency is called the *rufiyaa*.

The Maldives graduated from Least Developing Country (LDC) status on 20 December 2004 (MDGs Maldives, 2007), but the tsunami disaster hindered the progress of the country's development. As a result, the decision to change the status was reconsidered and it was decided that the Maldives would continue to receive full LDC benefits until 1 January 2008, with the graduation becoming effective in 2011. The Millennium Development Goals (MDGs) Maldives (2007, p59.) recognised a number of implications and concerns of graduating from LDC status to developing country status, which includes the loss of concessional lending terms, although some donors remain committed to concessional terms for the Maldives even after the graduation. The implications of this would result in higher costs of borrowing for the Maldives and could lead to diminishing funds available for development projects such as sanitation, waste management, and for climate change adaptation and mitigation projects.

The economy of the Maldives is based on tourism, fishing, shipping and agriculture; its geographical characteristics have restricted expansion into other sectors. The second-largest sector of the economy is fishing; the industry exports canned, dried, frozen and fresh tuna fish in particular. Tourism, the largest sector of the economy, accounts for over 28% of GDP, and brings in a significant amount of government tax income.

The Maldives has experienced rapid growth in its tourism industry over the last 35 years; visitor numbers of 1,062 per annum in 1972 have increased significantly, with current figures at over 600,000 arrivals per annum (Zubair *et al.,* 2011) More recent figures indicate that tourist arrivals have increased to over 931,000 a year and international tourism receipts accounted for 80% of the Maldives total exports (World Bank 2013a). Domroes (2001, p.122) describes the Maldives as a tropical island destination with a 'sophisticated tourism industry'. Other authors have commented on the Maldives as an example of 'successful' tourism development (Ellis and Amarasinghe, 1997; Inskeep, 1991). It has also been described as a successful example of planning and developing environmentally controlled and regionally staged small island tourism (Inskeep, 1991). The 'one resort one island' enclave tourism policy of the Maldives has been described as a way to minimise the negative impacts of tourism on local cultures, traditions and lifestyles due to minimum contact with local islands (Dowling, 2000). There are currently more than 94 tourist resorts in the Maldives (MoTCA 2008), each one being a self-contained unit, with its own electricity, sewage and waste disposal systems, leisure, catering and accommodation for both staff and guests, with transport systems – either local boats known as 'dhonis', speedboats or by seaplane which are fixed-wing twin otter engine aircraft with floats – connecting the resorts to the airport.

The Maldives has no conventional energy resources, such as oil and gas. It is highly dependent on imported petroleum fuels to meet all of its energy needs. The bulk of fuel imports is diesel fuel oil (DFO), which is mainly used for power generation both by the state power utility (STELCO) and by close to 1,000 electricity generators in the outer islands. DFO is also used in seawater desalination (for potable water production), and in steam generation. The country has examined the prospect of renewable/alternative energy to varying degrees, such as wind, solar and hybrid systems however it was found there was

insufficient wind in areas where projects were considered and the costs of the underwater cables that supplied the electricity was too costly. However there are micro hybrid energy projects (Small wind turbine, diesel, solar) being piloted in some local islands to see whether they are effective in reducing the amount of diesel consumption

The issue of waste disposal and waste management has become a significant issue in the discourse related to the Maldives, especially as tourism expands and local consumption increases; being geographically dispersed, the islands find it difficult and very costly to dispose of waste in a way that minimises the impact on the environment. With only one main rubbish collecting island near the capital, named 'Thilafushi', which is not an engineered waste management centre, many tonnes of rubbish are being deposited and buried, creating an ever-expanding land mass composed of garbage. The impact of this has resulted in increasing fumes and smoke being blown towards the capital Male', rubbish in outer atolls tend to be thrown into the sea because there is no facility in the region to manage and sort the waste.

FIGURE 1.2: Photograph of a Resort in a Coral Atoll. Maldives (Source: Geo Garage 2013, Online)

CHAPTER 2 – SIDS, VULNERABILITY, RESILIENCE AND CAPACITIES

2.1 INTRODUCTION

The chapter first discusses the concept of SIDS through the development of a SIDS category to determine the specific issues they face and why they are considered a special case. Furthermore, this chapter then explains socio-economic models that characterise them in terms of how they operate and the role tourism plays in SIDS and how this contributes significantly to SIDS economies. In addition, the chapter explains the variation between SIDS by geography, economics and environmental pressures. Finally the chapter discusses the concepts of vulnerability, resilience and capacities and what they mean for SIDS.

2.2 DEVELOPMENT OF SIDS AS A CATEGORY

According to the United Nations (UN), SIDS are generally low-lying island nations that share similar physical and structural challenges to their development (UN Division for Sustainable Development 2009). The majority of SIDS are found in remote areas, have a small land mass and have populations of less than 1.5 million. The UN has identified several challenges to development shared by SIDS: small population, limited resources, remoteness, susceptibly to natural disasters, vulnerability to external shocks and excessive dependence on international trade (UN Division for Sustainable Development, 2009). The UN has also recognised further factors that increase the vulnerability of SIDS; these are high transportation costs, high communication costs, disproportionately expensive public administration and infrastructure due to their small size, and little or no opportunities for economies of scale.

The UN Department of Economic and Social Affairs (UNDESA-DSD, nd.) has identified 52 SIDS (UN Division for Sustainable Development 2009). SIDS are often categorised into regions: 'AIMS' (Africa, Indian Ocean, Mediterranean and South China Sea), the 'Caribbean' and the 'Pacific'. At the 1992 Rio summit, the special case of island countries was codified in Agenda 21: i.e., the Agenda reflects a global consensus and political commitment regarding developmental and environmental cooperation, and SIDS are a special case within this concept (UWI, 2002). In 1994, a New Global Conference on the Sustainable Development of SIDS was held in Barbados. Known as the 'Barbados Programme of Action' (BPOA) the Conference translated Agenda 21 into specific policies, actions and measures to be taken at

the national, regional and international levels to enable SIDS to achieve sustainable development. The BPOA emphasised that the survival of SIDS is firmly based in their human resources and cultural heritage, which are the most significant assets; however they are under severe stress (SIDS Network, 1994). The BPOA further stated that sustainable development programmes must improve the quality of people's lives, with full consideration for women, youth and indigenous people. It also recognised that SIDS deserve international cooperation and partnership to help conserve, protect and restore their eco-systems. The BPOA presented a basis of action in 14 priority areas and indicates specific actions, policies and measures to address the challenges SIDS face; priority areas include climate change and sea level rise, natural and environmental disasters, energy resources, tourism resources, management of waste, coastal and marine resources, land resources, national institutions and administrative capacity, bio-diversity resources, freshwater resources, transport and communication, science and technology, regional institutions and technical cooperation, and human resource management (HRM) (BPOA, 1994).

The BPOA emphasised that the implementation of the Programme of Action would require important programmes and measures at the national and regional levels regarding finance, trade, legislation, technology, institutional development, information, participation and HRM. At the international level, the actions required relate to finance, trade, the transfer of environmentally sound technologies, cooperation and capacity building, and legislation and training.

In 1995, the SIDS unit was established to help follow up and implement the BPOA. The SIDS unit helps in the coordination of activities between governments, organisations and agencies within the UN system (UN Division for Sustainable Development, 2009). The 22nd special session of the UN general assembly carried out a comprehensive assessment of the implementation of the BPOA. In 2002, the world summit on sustainable development (UN-WSSD, 2010) reaffirmed and highlighted a series of SIDS-specific issues in the Johannesburg plan of action; it emphasised the importance of establishing exclusive economic zones for SIDS coastal areas – where appropriate, these zones could extend beyond 200 miles from coastal baselines.

In 2005, the Mauritius strategy (UN-MS, 2005a), was adopted to further implement the BPOA in order to assist in the sustainable development of SIDS. In addition, it recognised other areas of implementation, which included graduation from LDC status, trade globalisation and liberalisation ('World Trade Organisation' (WTO) ascension process, capacity constraints, erosion preferences, trade and food security, and lack of representation in Geneva) and health (UN-MS, 2005a). The strategy also recognised priority areas to address, which included climate change and sea-level rise; natural and environmental disasters; management of wastes; coastal and marine resources; freshwater resources; land resources; energy resources; tourism Resources; biodiversity; transportation and communication; science and technology; sustainable capacity development and education for sustainable development; sustainable production and consumption; national and regional enabling environments; health; knowledge management and information for decision-making, and culture (UN-MS, 2005b; ESCAP, 2010).

2.3 SOCIO-ECONOMIC MODELS OF SIDS

Socio-economic models of SIDS consider the structure and characteristics of individual SIDS' economy, society and government in order to identify common features that link some SIDS into subgroups. The characteristics relevant to the models can overlap; therefore more than one model can be applicable to each SID. The following discussion of socio-economic models of SIDS considers the Migration Remittances/Aid Bureaucracy or (MIRAB) model (Bertram & Watters 1985, 1986), People Considerations, Resource Management, Overseas Engagement, Finance, Insurance, Taxation and Transportation (PROFIT) model (Baldacchino, 2000), and the Small Island Tourism Economies (SITES) model (McElroy, 2003).

The MIRAB model of SIDS by Bertram and Watters (1985, 1986) attempted to model economic development in small Pacific islands. The islands investigated by the researchers were characterised by little or no trade restrictions, freely flowing capital, links with larger metropolitan economies, transnational migration as the norm, and aid and remittances acting as counter balances to trade deficits. These islands were emerging from a colonial past and were enjoying 'colonial welfarism' (Bertram, 2006), where the public sector played a large role in infrastructural investment and development projects. Productive assets of these economies, such as factories and shops, were only commercially viable through

government subsidies, which were lacking, so they were often run down and loss-making. However, unproductive assets, such as schools, hospitals and roads, were highly valued by the local community and as such, governments kept them in operation using post-colonial aid. As these economies ran on migration remittances and aid; their internal bureaucracies flourished. The MIRAB model fits in well with the Cook Islands, Kiribati and Tuvalu. Other SIDS, however have evolved differently and which do not fully fit the MIRAB model; in addition, when creating the MIRAB model, the expansion of tourism was not predicted (Bertram, 2006).

Baldacchino (2000) offers an alternative model. His PROFIT model has five jurisdictional dimensions mentioned earlier: People Considerations, Resource Management, Overseas Engagement, Finance, Insurance, Taxation and Transportation that SIDS use as a substitute for their lack of economic assets, in order to access 'extra territorial resources'. These 'active strategic players' have to have a 'shrewd survival strategy' (Bertram, 2006, p.4) to access or invite Foreign Direct Investment (FDI); they generally attract FDI through lax rules and regulations for the type of industry they want to attract, such as offshore banking, tax havens, ship registries and military outposts. The likely result is that employment will be concentrated in these sectors, and foreign investors are likely to have a large influence over policy, creating a form of dependency.

A third type of socio-economic classification of a SIDS economy is the SITEs Model which McElroy (2003) identified 36 small island tourism destinations, which represents a special 'case' of island development; therefore, of the 52 SIDS, 69% of them are dependent on tourism. Traditional MIRAB economies face a disadvantage when it comes to tourism development because they have dependent sovereign jurisdictional status (14 of the 52 SIDS are linked and dependent on a larger nation) – things such as currency, visas and travel arrangements are regulated by their larger patron economy, as a result of which they are not as flexible as islands that are not linked to a larger metropole. McElroy (2003) developed a Tourism Penetration Index (TPI) to identify highly developed tourist destinations, which Bertram (2006) notes has distinct overlap with characteristics of both the PROFIT and the MIRAB models. McElroy (2003) suggests that each SITE follows a natural, unidirectional progression along a 'lifecycle' from low to high tourism penetration, but Bertram (2006) argues that some islands do not have the pre-conditions for high tourist penetration, and

are likely to move up or down the TPI ranking. From this, it can be deduced that the tourism penetration of each SITE is likely to follow a unique trajectory.

2.4 TOURISM AND SIDS

As identified in the previous section, over two thirds of SIDS are dependent on tourism; therefore this section examines the role tourism plays in SIDS by examining the various ways tourism has contributed to SIDS economic development.

According to Shareef and McAleer (2005), tourism is currently the fastest growing tradable sector in the world economy. This is particularly applicable to SIDS; despite governments typically failing to understand the role of tourism in their economies (Darrow, 1995), which is partly due to the fact that the industry caters mainly to the middle and upper class from developed countries (Benjamin and Freedman, 1989), a significant number of small tropical island economies have reoriented their economies towards tourism development is related construction and financial services, and away from a reliance on agriculture and fishing products. Currently, approximately 69 % of SIDS are identified as small island tourism destinations. With tourism's contribution to SIDS' GDP reaching 60 % in some cases, it is a sizeable industry, and actors within this sector are likely to be stakeholders in SIDS' activities and operations; therefore tourism merits examination.

Multiple authors have undertaken island tourism research in various regions and topic areas. For example, Hills and Lundgren (1977) and Croes (2006) studied the Caribbean; Burns (1995) and Harrison (2004a) have focused on Fiji; Domroes (2001) examined the development of resorts in the Maldives; and Ioannides *et al.* (2001) focused on the Mediterranean. Other authors (Bardolet, 2001; Gossling, 2001; Briguglio *et al.* 1996) have examined environmental and sustainability issues concerning island destinations.

Islands are popular tourist destinations attracting visitor numbers that far exceed the population of their own countries (Hall, 2010) and often create a perception of exclusivity and high value for potential tourists. Also, island destinations have often been a useful tool for romantic imagery of the developed world as the ideal paradise (Harrison, 2004b). Not only does island tourism appeal to tourists, it is also increasingly becoming a valued

development strategy of many SIDS. However, tourism is not without its negative impacts, and is also not immune to certain events.

Firstly, SIDS have a comparative advantage in tourism, which helps counter their limited resource base. This is because tourism relies on renewable resources such as beaches, scenery, and a temperate climate amongst a number of features which, without tourism, hold little economic value (Mieczkowski, 1990), and these natural and cultural assets are deemed major attractions for tourism (Jules, 2005, p.5). This natural, cultural and/or social attractiveness, under normal circumstances, cannot be exchanged; therefore it can be valued at a premium and sold in the form of tourism (Michalic, 2002).

Secondly, tourism is the fastest growing economic sector in most SIDS, mainly due to increases in long-haul travel and the disposable income of tourists. This rate of increase, estimated to be approximately 4.6 % per annum in the Caribbean, exceeds the global rate of increase of 3.7 % (WTO, 2004a).

Thirdly, tourism makes up a significant share of SIDS' economies; it contributes to exports, job creation, tax revenues, GDP, investment and foreign exchange earnings (Richardson, 2007, p.1). As indicated by the UN (2010, p.16) SIDS Trend Report, identified international tourism receipts accounted for 51 % of the total value of exports of SIDS in 2007, up from 42 % in 2000. Also, it is estimated that tourism's direct contribution to gross domestic product (GDP) in SIDS has grown from US$3.2 billion in 1988 to US$9.2 billion in 2004, with direct and indirect contribution expanding from US$6.9 billion to US$18.8 billion (Craigwell, 2007, p.3). Substantial variation exists between SIDS regarding the contribution of tourism to their economies, and as a share of individual SIDS' exports, but for all small island tourism destinations, it is a notable proportion (see figure 2.1). The UNWTO (2012) states that annual revenue generated by international tourism in SIDS currently exceeds US$38 billion, and in the past decade, international tourist numbers visiting SIDS have increased by more than 12 million to reach 41 million in 2011.

A particularly important contribution of tourism to SIDS' economies is the bringing of foreign currency into the country by tourists. This helps SIDS to make international transactions, as the local currency, due to the small size of their economies, is deemed

relatively useless. In addition, official international reserve assets allow a central bank to purchase the domestic currency, which can stabilise the domestic currency's value, and is likely to reduce inflation. Foreign exchange reserves are important indicators of SIDS' ability to repay foreign debt, and can determine the credit rating of the SIDS. Excess reserves of foreign currency can be used to make investments both internally and externally.

FIGURE 2.1: International Tourism Receipts as Percentage of Total Exports and GDP in 2007 (Source: World Bank, 2010; Original in Colour)

In addition, Shareef and McAleer (2005) state that tourism arrivals have a direct link with the balance of payments of a destination. A significant increase in arrivals improves the current account balance, enhances financial reserves, and thus leads to a stronger exchange rate; therefore, the economy would be able to purchase imports more cheaply.

Fourthly, specialisation in tourism provides numerous opportunities to create linkages between it and the more traditional sectors; for example, agriculture and fisheries. This is largely because,

> "It brings consumers to the product thus increasing the potential for additional demand for goods and services throughout the economy" (Jules, 2005, p.5).

This specialisation of the economy, according to Oyewole (2001), has a strong, positive correlation with economic performance, and so countries that specialise in tourism are

expected to demonstrate significant economic growth. In turn, economic development in small islands is positively linked to growth in tourism (Latimer, 1985; Modeste, 1995).

Fifthly, the restriction of preferential trade arrangements stemming from the establishment of the WTO has resulted in the decline of agricultural exports of SIDS. Tourism faces relatively few trade barriers to its promotion in the global economy. According to Michalic (2002), tourism has advantages over the export of traditional goods and services; for example, the tourism product is both produced and sold locally so costs of insurance and transportation can be lower.

Sixth, as noted above, SIDS' unique characteristics, such as their small size, increase the country's vulnerability. Read (2001) claims that small size has particular disadvantages when it comes to achieving economies of scale among the economic activities engaged in the country. Croes (2006) argues that size restrictions of SIDS force them to look to the global economy in order to achieve economies of scale in the production of exports, thus opening them up to the world market; tourism is a sector that, by its nature, predominantly relies on the global economy. In addition, tourism has a number of advantages that help it to combat the limitations: it provides volume to overcome a lack of market demand and thus enables lower unit costs of production; resulting freer trade and its scale in SIDS can help increase the level of living standards; and it enhances competition by encouraging new entrants, which helps to increase technology and enhance the quality of the goods and services (Croes, 2006). With the continual improvement of communication technologies and international transport development, these less developed destinations that are further away from the source market are able to enjoy economic development through tourism. However, some researchers have questioned tourism's ability to overcome the problems associated with certain characteristics of islands, such as being small and having relatively high national costs (Fagance, 1999; Rao, 2002).

Finally, there are a significant number of external actors who are willing to invest in the tourism industry of SIDS. De Albuquerque and McElroy (1992), in their study of Caribbean, Pacific, Mediterranean and mid-Indian ocean islands, identified that a significant amount of foreign investment – both private and public – was available, and financed the expansion of many of the islands' tourism sector. Shaw and Shaw (1999) support this by pointing to the

availability of some private capital from American, Japanese and European firms, and public capital in the form of grant aid or loans from agencies, such as the IMF and World Bank, which helped to fund projects in Bali, Singapore and the Maldives (Shaw and Shaw, 1999; World Bank, 2004a). Foreign direct investment (FDI) into the tourism sector can benefit SIDS in a number of ways; Barrowclough's 2007 study on FDI in tourism in SIDS documents some of these benefits (see table 2.1); however, she does state that to enable developing countries to soak up the benefits of tourism FDI, a balance must be maintained between foreign and domestic investment in the tourism sector in order to for SIDS to be able to address their human and economic vulnerabilities. She also identifies that there is a need for more information about FDI patterns in SIDS; for example, knowing how to get the maximum benefit from FDI at minimum sustainable cost is vital.

TABLE 2.1: Findings of FDI in Tourism in SIDS
Modes of equity in developing countries   SIDS tend to have around 45% equity investment from abroad, and 30% of hotels are under management contracts. For example, in the Dominican Republic, foreign companies had equity in 21 out of 34 hotels, and had management contracts in 12 hotels; significant equity investments were found in Fiji, Jamaica and the Reunion Islands. SIDS also used significantly more franchising than other LDCs, which is particularly effective if there are high levels of management capacity, knowledge and experience domestically.   Through relationships of equity investment, management contracts and franchising with foreign investors, local investors are able to enter the global market. In addition, forging links with foreign companies and institutions can help the development of tourism in areas that have not yet experienced a tourism industry. As the level of individual SIDS' development increases, so does their ability to harness the value created by the foreign company.
Consumer Demand   An international branded hotel can raise the profile of individual emerging SIDS, and help boost consumer demand by giving consumers a familiar brand through which they can

TABLE 2.1: Findings of FDI in Tourism in SIDS
experience an unfamiliar destination. Also, through the foreign company's access to global marketing and global distribution networks, SIDS can reach a larger pool of potential consumers. According to tourism investors and managers, tourist boards of destinations are not as effective as a known brand's loyalty schemes, corporate networks and direct mail promotions that are sent to a large number of customers. Therefore, FDI by known brands is particularly important for destinations that are not able to differentiate themselves from competitors with similar services. In destinations with a long, rich history of tourism, the relative importance of a brand name is less crucial. However, Sri Lanka has become less competitive due to the departure of many international branded hotels.
Capital Formation SIDS often lack the required resources in terms of savings and finance to invest in infrastructure and development of tourism facilities, and to design, manage and market tourism for the destination. In this situation, FDI can play a crucial financial role, alongside domestic investment. Foreign reserves can help in the process of refurbishment and restoration of existing capital stocks There is, however, risk of uncertainty amongst foreign investors due to the potentiality of natural disasters and political volatility within an island nation; these doubts can lead to the required reinvestment not taking place. The likely result is that the destination's hotels become less competitive, which can lead to hotels having to reduce their prices, and so the perceived value of the destination falls.
Human Resources The number of expatriate workers employed in a destination will depend on the skills and

TABLE 2.1: Findings of FDI in Tourism in SIDS
experience levels of the domestic workforce. Many SIDS do not have the resources to develop their own hotel schools, so domestic workers do not have an opportunity to develop their skills. Foreign branded international hotels often have formal training schemes, including modular packages that can develop the skills of staff in the different departments of the resort, such as housekeeping, food and beverage, and sales and marketing. Staff may also benefit from the brand's international links; for example, by giving them the opportunity to gain experience in hotels abroad and further develop their skills.
Procurement Linkages The domestic economy of SIDS may lack the resources to purchase some domestically produced goods and services. FDI into the tourism sector of SIDS is ideal for the procurement of locally produced goods and services; this not only helps the local economy and is a way to include smaller producers in the global market place, but is also the best way for the tourist company to provide an authentic tourist experience. One problem is that local producers often find it difficult to supply what international hotel chains need in terms of quality and reliability of supply.

(Source: adapted from Barrowclough, 2007, pp. 615-638)

2.5 VARIATION BETWEEN SIDS

This section examines the differences in geography, economics and environmental pressures facing SIDS. The geography in terms of location; size; topography and population will vary among SIDS. There are SIDS located in the Caribbean, Indian Ocean, Pacific Ocean and parts of the Atlantic Ocean. For example Nauru which is located in the Pacific Ocean is 21km2 in size, with a population of 5000 and the highest point above sea level is 61m whereas Papua New Guinea which is also based in the Pacific Ocean is 462,840km2 in size, a population of 7,013,800 and the highest point is 4509m above sea level. There are also economic variations between SIDS in terms of GDP/per capita, national debt, international

tourist receipts and tourist arrival numbers. For example Maldives tourist receipts accounted for 80.26% of total exports with annual tourist arrivals of 931,000. In comparison, Bahrain, its international tourist receipts accounted for 7.7% of total exports.

There were variations in the environment of SIDS, in terms of precipitation, species at risk, forested area, temperature, annual rainfall, natural hazards and environmental issues. For example Cape Verde was at risk from natural hazards such as prolonged droughts, a seasonal wind that produces obscuring dust and is at risk from an environment that is volcanically and seismically active. Environmental pressures include deforestation, soil erosion, water shortages, desertification, birds and reptiles at risk from environmental damage, sand mining and overfishing. In comparison Antigua and Barbuda is at risk from natural hazards such as hurricanes, tropical storms, periodic droughts and contends with environmental pressures such as limited natural freshwater resources and deforestation.

SIDS may also differ in terms of being a member of the UN or not, out of the 52 SIDS, 38 are UN members and 14 that are not. Furthermore 10 SIDS are classified as LDC's however this status may change over time. See (tables 2.2 and 2.3) below for a detailed examination of the variation between SIDS.

TABLE 2.2: Geography, Economy and Environment

UN Members	Geography				Economy				Environment				
Name	Location	Area (km^2)	Max. height above sea level (m)	Pop,n	GDP/ Capita (US $)	Public Debt (% of GDP)	Tourism Receipts (as % of total exports)	No. of tourist arrivals	No. at risk species	Forested Area (% of land area)	Precip (mm)	Temp Min (^{o}C)	Temp Max (^{o}C)
Antigua & Barbuda	Caribbean	442.6	402	89,018	22,100	89.1	58.1	241,000	8	23	1030	23.9	29.6
Bahamas	Caribbean	13,880	63	347,200	30,900	51.8	65.9	1,346,000	10	51.4	1292	16.7	31.8
Bahrain	Persian Gulf	760	122	1,248,348	29,200	33.7	7.7	6,732,000	8	0.6	83	14.1	38
Barbados	Caribbean	430	336	273,900	23,600	72.2	51.9	568,000	8	19.4	1422	25.1	27.1
Belize	Caribbean	22,966	1160	327,719	8,300	78	26.8	250,000	6	61.9	1705	24	27
Cape Verde	Atlantic Ocean	4,033	2829	500,600	4,000	97.2	56	428,000	13	21	228	23.5	29.3
Comoros *	Indian Ocean	2,235	2360	753,900	1,200	42.6	-	11,000	13	2	900	21.2	29.5
Cuba	Caribbean	110,860	2005	11,253,700	9,900	35.1	-	2,688,000	18	26.3	1335	18.6	31.6
Dominica	Caribbean	751	1447	67,700	13,600	72.1	58.9	76,000	9	60.3	2083	21.6	30.5
Dominican Republic	Caribbean	48,670	3175	10,056,200	9,300	33.4	31.3	4,306,000	17	40.8	1410	19.6	31.5
Fiji	Pacific Ocean	18,274	1324	868,400	4,600	46.9	42.5	675,000	15	55.1	2592	20.4	31
Grenada	Caribbean	344	840	104,900	13,300	112.5	57	118,000	10	50	2350	25.1	29.3
Guinea-Bissau*	Atlantic Ocean	36,125	300	1,547,100	1,100	60.5	7.9	-	5	72.6	1577	24.4	27.4
Guyana	Atlantic Ocean	214,969	2835	756,000	7,500	57.6	7	157,000	3	77.2	2387	24	32

UN Members	Geography				Economy				Environment				
Name	Location	Area (km²)	Max. height above sea level (m)	Pop,n	GDP/ Capita (US $)	Public Debt (% of GDP)	Tourism Receipts (as % of total exports)	No. of tourist arrivals	No. at risk species	Forested Area (% of land area)	Precip (mm)	Temp Min (°C)	Temp Max (°C)
Haiti*	Caribbean	27,750	2680	10,123,800	1,200	20.4	15.9	349,000	19	3.7	1440	23.5	31.5
Jamaica	Caribbean	10,991	2256	2,751,300	9,000	142.7	48.06	1,952,000	15	31.2	2051	22.9	31.4
Kiribati*	Pacific Ocean	811	81	101,100	6,200	-	-	5300	14	15	-	27.6	28.1
Maldives	Indian Ocean	298	2.4	338,400	8,400	91.8	80.26	931,000	10	3	1972	25	32
Marshall Islands	Pacific Ocean	181	10	68,480	2,500	54.1	-	5000	12	70.2	-	26.7	27.7
Federated States of Micronesia	Pacific Ocean	702	791	111,500	2,200	-	-	-	15	91.5	469	23.4	31.2
Mauritius	Indian ocean	2,040	828	1,306,600	15,000	50.29	31	965,000	18	17.2	2041	20.2	26.9
Nauru	Pacific Ocean	21	61	10,300	5,000	-	-	-	14	-	2236	25	29.9
Palau	Pacific Ocean	459	242	20,600	9953	-	-	109,000	13	87.6	3746	24.2	31
Papua New Guinea	Pacific Ocean	462,840	4509	7,013,800	2,500	23.3	0.04	165,000	12	64.1	3142	25.4	27.7
Samoa*	Pacific Ocean	2,831	1857	183,900	6000	-	68.15	121,000	12	60.4	2928	24.4	29.9
São Tomé and Príncipe*	Atlantic Ocean	964	2024	168,000	2,000	65.56	54.19	8000	-	28.1	3200	23.3	28.6
Singapore	South Malay Peninsula	697	166	5,187,900	59,900	108.16	3.27	10,390,000	17	3.3	2497	24.9	31.6

UN Members	Geography				Economy				Environment				
Name	Location	Area (km²)	Max. height above sea level (m)	Pop,n	GDP/ Capita (US $)	Public Debt (% of GDP)	Tourism Receipts (as % of total exports)	No. of tourist arrivals	No. at risk species	Forested Area (% of land area)	Precip (mm)	Temp Min (°C)	Temp Max (°C)
St Kitts and Nevis	Caribbean	261	1156	53,100	16,400	82.9	40.78	92,000	8	42.3	1427	25.1	29.3
St Lucia	Caribbean	616	950	176,000	12,900	84.76	56.66	312,000	9	77	2301	25.9	29.1
St Vincent and Grenadines	Caribbean	389	1234	109,400	11,700	67	48.32	74,000	8	68.1	1583	25	30.5
Seychelles	Indian ocean	455	905	86,900	24,700	69.4	34.61	194,000	18	88.5	2330	23.9	31
Solomon Islands*	Pacific Ocean	28,896	2310	552,300	3,300	6.73	19.8	23,000	-	-	3028	22.3	30.7
Suriname	Atlantic Ocean	163,820	1230	529,400	9,500	19.99	2.59	220,000	3	94.6	2331	21	32
Timor-Leste*	South China Sea/Indian Ocean	14,874	2963	1,153,800	3,100	-	21.1	51,000	5	51.4	1500	23.9	26.3
Tonga	Pacific Ocean	747	1033	104,500	7,500	-	40.15	46,000	10	12.5	1610	20.2	26.8
Trinidad & Tobago	Caribbean	5,128	940	1,346,400	20,300	29.14	5.21	386,000	6	44.4	2200	23.2	31.8
Tuvalu*	Pacific Ocean	26	5	9,800	3,400	42.5	-	1200	15	33.3	3200	25	31
Vanuatu*	Pacific Ocean	12,189	1877	245,600	2687	22.96	71.23	94,000	14	36.1	2222	21.5	28.2

Non-UN Members	Geography				Economy				Environment				
Name	Location	Area (km²)	Max. height above sea level (m)	Pop,n	GDP/ Capita (US $)	Public Debt (% of GDP)	Tourism Receipts (as % of total exports)	No. of tourist arrivals	No. at risk species	Forested Area (% of land area)	Precip (mm)	Temp Min (°C)	Temp Max (°C)
American Samoa	Pacific Ocean	199	964	68,061	8,000	-	-	130,000	-	89.4	3990	25	32
Anguilla	Caribbean	91	65	15,423	12,200	-	-	118,400	-	71.4	890	24.2	26.8
Aruba	Caribbean	180	188	107,635	21,800	-	19.82	870,000	-	2.2	510	26	29
British Virgin Islands	Caribbean	151	521	31,148	38,500	-		308,793	-	24.4	1150	19	31
Northern Marianas	Pacific Ocean	464	965	44,582	12,500	-	-	336,000	-	65.22	1800	26	28.3
Cook Islands	Pacific Ocean	236	652	10,777	9,100	-	-	112,104	-	66.5	2500	18	28
French Polynesia	Pacific Ocean	4,167	2241	274,512	18,000	-	-	163,000	-	28.7	1700	23.6	25.8
Guam	Pacific Ocean	544	406	185,674	15,000	-	-	1,196,000	-	48.15	2413	22.2	29.4
Montserrat	Caribbean	102	930	5,164	8,500	-	-	9905	-	35	1740	23	29

Non-UN Members		Geography			Economy				Environment				
Name	Location	Area (km^2)	Max. height above sea level (m)	Pop,n	GDP/ Capita (US $)	Public Debt (% of GDP)	Tourism Receipts (as % of total exports)	No. of tourist arrivals	No. at risk species	Forested Area (% of land area)	Precip (mm)	Temp Min (^{o}C)	Temp Max (^{o}C)
Netherland Antilles	Caribbean	960	862	227,049	17,800	-	-	900,000	-	12	860	24	32
New Caledonia	Pacific Ocean	18,575	1628	260,166	15,000	-	-	112,000	-	39	2800	22.5	28.5
Niue	Pacific Ocean	260	68	1,269	5,800	-	-	6214	-	54.2	2000	27	30
Puerto Rico	Caribbean	13,790	1338	3,998,905	16,300	66	28	3,048,000	-	62.2	2054	19	29
US Virgin Islands	Caribbean	1,910	474	109,574	14,500	-	-	536,000	-	61	1550	22	32

(Sources: CIA World Fact Book 2013; IMF 2013; UN-OHRLLS 2013; World Bank 2013b) *LDC

TABLE 2.3: Natural Hazards and Environmental Issues

Name	Location	Natural Hazards	Environmental Issues
Antigua and Barbuda	Caribbean	Hurricanes; Tropical Storms; Periodic Droughts	Water Management - limited natural freshwater resources Deforestation – soil wash off
Dominica	Caribbean	Flash Floods; Hurricanes	Environmental Damage – Development Waste Management - Pollution
St Lucia	Caribbean	Hurricanes; Volcanic Activity	Deforestation; soil erosion
Fiji	Pacific Ocean	Cyclonic Storms	Deforestation; soil erosion
Tonga	Pacific Ocean	Cyclones; Earthquakes; Volcanic Activity	Deforestation – for agriculture; Coral Reef Damage – Star Fish; Overhunting - threatens turtle populations
Tuvalu*	Pacific Ocean	Severe Tropical Storms such as Cyclones (rare) when they do occur cause significant damage due to low level of islands	Water Management – limited fresh water resources and ground water table at risk from rising sea level; Beach Erosion – due to sand mining; Deforestation; Coral Damage – Crown of Thorns Star Fish;
Seychelles	Indian Ocean	Outside of Cyclone zone – severe storms are rare, short periods of drought occur at times	Water Management – require improved water catchment and storage facilities
Maldives	Indian Ocean	Tsunami's, Storm Surges – risk of flooding due to low elevation of islands; annual flooding in some islands due to strong winds and high waves; outside of cyclonic belt severe storms are rare; short periods of drought	Depletion of water resources – lack of consistent rainfall and sufficient catchment and storage; Fresh water aquifers threatened by sea level rise; Coral Bleaching; Pollution – lack of adequate waste management facilities; Overfishing- foreign trawlers
Mauritius	Indian Ocean	Cyclones	Water Pollution; Degradation of Coral Reefs
Cape Verde	Atlantic Ocean	Prolonged droughts; seasonal wind produces obscuring dust; volcanically and seismically active	Deforestation; soil erosion; water shortages; desertification; birds and reptiles at risk from environmental damage; sand mining; overfishing
Guinea-Bissau*	Atlantic Ocean	Dusty seasonal wind reduce visibility during dry season; brush fires	Deforestation; soil erosion; overgrazing; overfishing

(Sources: CIA World Fact Book 2013; UN-OHRLLS 2013) *LDC

2.6 VULNERABILITY

Vulnerability can be defined as the potential for attributes of any system - human or natural - to respond adversely to events (UNEP, 2005). Hazardous events are those that can lead to the loss of the diversity, extent, quality and function of ecosystems. These changes are often described as damage to the biological integrity or health of ecosystems, and by implication, their ability to keep supporting humans. These may include natural hazards as well as human pressures. Vulnerability to damage arises from a combination of the inherent characteristics of a country, the forces of nature and human use, including the special case of climate change. (UNEP, 2005, p.4)

The preamble of the BPOA states that although SIDS are confronted with economic difficulties and development issues similar to those of other developing countries, SIDS have their own peculiar vulnerabilities and, in the pursuit of sustainable development, these are severe and complex (SIDS Network, 1994). Vulnerability refers to the proneness of states to damage from external forces or disasters (UWI, 2002) such as natural disasters or processes (for example, hurricanes, tsunamis, and climate change) or economic shocks; the higher the vulnerability of a state, the more disposed it is to damage, and the lower its ability to develop sustainably. SIDS are estimated to be 34% more vulnerable than other developing states, largely because of their exposure to natural disasters and high level of export concentration (UN, 2005). SIDS are open to three types of vulnerability – economic, environmental/ecological, and social – which overlap and arise from the interplay of factors unique to SIDS. These types of vulnerability are considered in turn, along with factors that contribute to these vulnerabilities.

Economic vulnerability refers to the risks faced by economies from exogenous shocks to the systems of production, distribution and consumption; it arises largely from the exposure of SIDS to the economic conditions of the rest of the world (UWI, 2002). SIDS economies therefore tend to be very volatile in terms of their GDP and exports (UWI, 2002). Contributing factors include dependence on fossil fuels, geographic remoteness, and dependence on external markets and economies.

Exogenous economic shocks impact SIDS through varying mechanisms depending on the socio-economic models that the SIDS conform to – whether MIRAB, PROFIT or SITE; this may

mean different socio-economic types of SIDS have different levels of vulnerability to exogenous shocks.

A MIRAB country's dependence on remittances and aid for its development means that a change in the policies – in relation to levels of aid, employment of foreign workers and wages – of foreign economies to accommodate negative economic shocks will impact financial resources available to these SIDS; however, MIRAB economies tend to show a low susceptibility to external shocks compared to other SIDS as remittances are a relatively stable source of income.

A PROFIT as Hampton (2002) indicates, is likely to become over-dependent on FDI; therefore, following exogenous economic shocks, FDI may dry up resulting in a fall in revenues and with increasing pressure from multilateral agencies over money laundering and information access, these destinations may become less attractive for FDI . However SIDS that already have quite a high amount of FDI are likely to have a lower vulnerability to these shocks.

A SITE country's dependence on long-haul tourism means that during and after exogenous economic shocks, when there is likely to be a reduction in demand from source markets for holidays, there will be a reduction in revenue. For example increases in fuel prices and carbon taxes will have an effect on the cost of travel for source markets because airlines will face increasing costs of operation and is likely to result in an increase in fuel surcharges and thus ticket prices. For SITES which have a significant proportion of their market from travellers who are price sensitive this can result in a fall in demand and eventually could result in a fall in the number of scheduled and charter flights arriving into the destination. This reduction in tourist arrivals will impact revenues, taxes and employment for the host destination. Tourism is unlikely to disappear completely, but there will probably be a shift towards destinations closer to source markets, such as the Caribbean, and away from distant destinations, such as the Maldives. See table 2.4 below for the significance of long-haul travel are for some SIDS and the contribution of tourism and travel to their GDP.

TABLE 2.4: SIDS, their Long-Haul Inbound Flights as a % of Total Flights and the Contribution of the Travel and Tourism Industry to GDP

SIDS	LONG-HAUL INBOUND SHARE % *	CONTRIBUTION OF TOURISM AND TRAVEL TO GDP
Maldives	70	63.4
Barbados	82	48.1
Mauritius	80	26.5
Antigua and Barbuda	100	78.5
Vanuatu	100	47
Fiji	100	30.9
Dominican Republic	98	15.9
Aruba	72	78
Belize	88	28.2
Cape Verde	100	21.9
Dominican Republic	98	15.9

(Source: adjusted from Burns and Vishan, 2010, p.6)

Sources:*Long Haul Inbound Share IATA (2008), Ringbeck *et al.*, (2008). Note: Share of all inbound air transport passengers in 2008 on medium- and long-haul connections, including domestic traffic, is based on IATA data. Short Haul is defined as <1000km, medium-haul: 1000 - 3000km, and long-haul >3000km.

**GDP Figures: WTTC Country Reports (WTTC 2010a)

SITEs have been found to be particularly vulnerable to exogenous economic shocks. In 2004, 19 of the top 25 countries ranked in terms of the contribution of tourism and travel as a percentage of GDP were SIDS (UN-OHRLLS, 2009); therefore their economies are particularly susceptible to shocks that reduce levels of tourism. Tourism has exerted and continues to exert profound influence on employment, foreign exchange earnings, land use and land ownership in SIDS; over time a large proportion of the already limited land area has become owned by foreigners, which increases a SIDS dependence on tourism revenues, thereby crowding out other industries and agriculture, and making the SIDS extremely vulnerable to exogenous economic shocks. In addition, foreign land ownership restricts SIDS governments ability to manage vulnerability not just in economic dimensions, but also in the social and environmental ones.

Environmental vulnerability reflects the risk of damage to the country's natural ecosystems; for example, coral reefs, wetlands, fresh water, coastal areas and marine resources, forests and soils (UWI, 2002), each of which is essential in providing services to the economy and society. Subsequently, any degradation they experience lessens the level of service provided to meet domestic needs and contribute to export earnings. Contributing factors include geographic location and proneness to natural disasters, physical size, human activity, limited to biodiversity, low elevation above sea level, and the dependence of some islands on coral reefs.

SIDS tend to be located in regions prone to natural hazards. For example, Caribbean SIDS are located in the 'hurricane belt', those located in the Indian Ocean are particularly prone to tsunamis, and in the Pacific Islands, cyclones accounted for 76% of the reported disasters between 1976 and 2004, with average costs per cyclone of US$75.7 million in real 2004 value (UN-OHRLLS, 2009). In 2004, Hurricane Ivan destroyed nearly 90% of hotel rooms and 80% of native trees in Grenada, the damage value was 38% of the country's GDP which was valued at US$527 million (UN-OHRLLS, 2009). As a relatively high proportion of their land mass is coastal, SIDS are very exposed to these natural phenomena. These disasters can cause a great amount of damage to SIDS natural resources, and disrupt the functioning of their ecosystems; and often the remaining scarce resources must be diverted to the repair of infrastructure away from social services such as health that are also often damaged during natural disasters.

Social vulnerability concerns the degree to which societies are affected negatively by stresses and hazards, whether brought about by external forces or internal factors that negatively impact on the social cohesion of a country (Cutter *et al.,* 2003). Social cohesion for a society is important as it helps determine the quality and development of its institutions (Jenson, 2010). This in turn impacts on whether and how pro-growth policies are devised and implemented and is essential for generating the confidence and patience needed to implement reforms, as citizens have to trust the government that short-term losses arising from the reform will be offset by long-term gains (Easterly *et al.,* 2006).Contributing factors include institutional framework, institutional capacity, and dependence on tourism (Cutter *et al.,* 2003; Easterly *et al.,* 2006; Jenson, 2010).

Institutions, as well as being determined in part by social cohesion in a society, also contribute to the proneness of a state to damage by the internal or external stresses that impact the society's social cohesion where, as Bertram (2006) has identified, institutional constraints – such as poor governance and a lack of accountability – play a major role in inhibiting SIDS development. SIDS, by definition, are developing, so their institutions are likely to be weak. The institutional frameworks of SIDS contribute to their vulnerability through a number of methods. The framework determines the specific government policies and behaviour that are possible, which influences the practicality of policies, economic flows, and political linkages – per capita GDP of SIDS can be determined by how close political linkages are between SIDS and metropolitan patrons (Bertram, 2006), and so the flow of aid, trade and loans from the latter to the SIDS. McElroy and Mahoney (2000) estimated that dependent islands in the Caribbean had per capita GDP of $11,214 compared to $5,898 for independent SIDS.

In addition, divisions – whether religious, ethnic or economic – are often the norm in most states (Pamir, 1997). SIDS are no exception, and the quality of institutions determines the extent to which these divisions are reflected in the distribution of power within a society. If institutions are weak, it is likely that a group within that society holds a disproportionate amount of power (Moe, 2005); therefore policies and actions will probably not be pro-development, and are likely to benefit this group at the expense of the rest of society, leaving the latter less protected from internal or external shocks than the former, and thus more vulnerable.

In addition, institutions determine the strength of the processes for conflict resolution; states with weak institutions usually have weak conflict resolution mechanisms which makes it near impossible for governments to reach agreement on policies, and to implement and enforce these policies (Jenson, 2010). Therefore adequate structures to cope with shocks that a country may experience are less likely to be in place, and if the country does experience either an internal or external shock, it will diminish the ability to respond quickly enough to avoid further damage (IIED, 2009).

As well as institutional framework, SIDS are likely to have low institutional capacity due to the small size of their economies. Weaknesses in institutional capacity are likely to produce at least four characteristics in public administrations (FAO,2006; UNEP, 2008; Dixit, 2010). Small staffing for multiple portfolios, which leads to overextended personnel, small reserve capacity, only a limited number of specialists attracted or retained, limited promotion and mobility. Limited financial resources; which results in inadequate compensation levels, inappropriate and infrequent training, and high turnover. Lack of training, leads to a shortage in management skills; low problem-solving capacity; low levels of innovation and entrepreneurship; low adaptability to changing conditions, and excessive routine dependence (Dixit *et al.*, 2010). Poor working environments, which creates low morale and motivation, low job satisfaction, low productivity, high levels of fear and frustration, absenteeism, and systemic uncertainty (UWI, 2002). The weaker the capacity of individual SIDS' institutions the more vulnerable they are to negative shocks.

2.7 RESILIENCE

Following on from a discussion of the vulnerability of SIDS, the concept of resilience can be found in a number of fields including sustainable development, disaster management and climate change (Handmer and Dovers, 1996; Adger, 2000; Klein, 2002).Handmer and Dovers (1996) mention two forms of resilience which can be identified within a system; these are *reactive* resilience (strengthening current system) and *proactive* resilience (developing a system that can adapt to changes). The United Nations International Strategy for Disaster Reduction (UNISDR) also identifies the role of resilience in dealing with natural hazards and defines it as,

"The capacity of a system, community or society to resist or change in order that it may obtain an acceptable level in functioning and structure. This is determined by the degree to which the social system is capable of organizing itself and the ability to increase its capacity for learning and adaptation, including the capacity to recover from a disaster" (UNISDR, 2004. p. 6).

Paton (2001) posits that communities can possess characteristics that can make them vulnerable but at the same time have other characteristics that influence their capacity to adapt; therefore communities can be both vulnerable and resilient. Moreover, vulnerability could signify a low level (rather than a lack) of resilience, thus limiting capacity to recover; however, each system has some degree of resilience. Therefore resilience could be viewed as the intrinsic capacity of a system (Manyena, 2006).

UNEP (2005) suggests that resilience can be built by knowing how vulnerable each of three pillars of sustainability, namely environmental, economic and social aspects of a country's development. Furthermore environmental management is seen as a tool for the development of guidelines for action, the use of protection, or by limiting exploitation, degradation and pollution but is deemed insufficient on its own to ensure a sustainable future. Moreover, vulnerability would be influenced by three aspects: (1) the risk of hazards, (2) the natural resilience and resistance to damage (also known as intrinsic vulnerability), and (3) the acquired resilience/vulnerability to damage (UNEP, 2005, p.6).

The BPOA and the Mauritius Strategy provide a comprehensive overview of the major areas in which action is needed to reduce vulnerabilities and build resilience. In addition, the five-year review of the Mauritius Strategy for the Implementation of the Barbados Programme of Action (MSI+5) has highlighted such priority areas as climate change mitigation and adaptation; energy efficiency and renewable resources; natural disasters; trade; marine and coastal resources; fishing; tourism; reducing financial debt, and greening of economies (MSR, 2010, pp.4-5).

According to ECLAC (2011) the first and most important step in adaptation or building of resilience is enhancing the understanding of risk and the science behind the hazards that threaten the Caribbean region. Examples of measures to reduce vulnerability and promote resilience can be found in Caribbean SIDS. These SIDS are urged to develop adaptation strategies, such as conducting in-depth studies on natural environmental impacts

specifically in terms of biophysical and socio-economic impacts, use of building codes, improved building codes meant to build resilience to hydro-metrological events and hurricanes, and coastal zoning. For example Jamaica as a resilience-building response to reducing vulnerability to the anticipated impacts of sea level rise reviewed best practices in terms of preparedness, resilience building and climate change adaptation in other countries (ECLAC, 2011, p.5). Adaptation measures can include purely technical (infrastructure against sea level rise; improved water use efficiency; demand-side management through metering and pricing); behavioural (altered food and recreational choices); managerial (Altered farm practices), and policy (planning regulations; regulations improved; building codes) (Nurse, 2007).

The ECLAC (2011, p. 27) states that the ability of Caribbean countries and societies to build resilience will depend on exposure to the particular shock, levels of poverty in the country or society, and the gender roles and functions in the society (gender equity). Furthermore, it was identified that adaptation appears to be the best option for resilience issues.

2.8 CAPACITIES

2.8.1 Concept of Capacity

A capacity is the ability of an actor (such as an individual, organisation, community, institution or system) to perform an 'appropriate task' (which is defined by necessity, history or situation in specific contexts) (Hilderbrand and Grindle, 1994); it deals with aptitudes, resources, relationships, and facilitating conditions (Brinkerhoff, 2007, p.4). Capacities of a system or organisation determine their ability to respond to and cope with disasters, mitigate recurrent environmental and economic shocks (UN, 2005), and overcome causes of exclusion and suffering (Eade, 2007). Capacities in respect of SIDS refer to the overall ability of individual SIDS' systems to create value (Morgan, 2006), to perform and sustain themselves. These factors are important in determining SIDSs abilities to deal with the unique factors that contribute to each one's vulnerabilities, and therefore help determine their ability to manage their specific vulnerabilities.

Capacity encompasses five central characteristics (Morgan, 2006), and can be conceptualised as being built on six core 'capabilities' (which refer to a broad range of

collective skills) found in all organisations or systems (Morgan, 2006; Winkler *et al.*, 2007).
How effectively, efficiently, and sustainably a task is performed will vary depending on the
strength of the capacities required, and the presence and balance of the capabilities that
these capacities are built on. In addition, the context will also influence the ability of an
actor to perform a given task. Context is made up of multiple dimensions of capacity;
different researchers divide context into different dimensions of capacity, but there are five
that are recognisable in most (although they may be combined to create fewer groups such
as the UNDP's categorisation – see below). Hindlebrand and Grindle (1994) state that the
five dimensions are the action environment, the institutional context, the task network,
organisations, and human resources (or individuals). Each dimension of capacity includes a
set of factors that may hinder or facilitate an actor's ability to achieve particular tasks. Each
of these points is considered in turn.

According to Ahmed and Mustafa (2007, p.82), the use of the concept of capacity emerged
in response to the supposed negativity of the term 'vulnerability', which suggests that
people are passive victims, rather than acknowledging the capacities that communities and
people inherently have to deal with or resist hazards (Cannon *et al.*, 2003). Capacities and
vulnerabilities, however, do not have to be polar opposites; high vulnerability does not
equal low capacity. For example, someone who has a low nutritional uptake may be
characterised by low physical capacity, but they may contribute significantly through their
disaster management skills, and therefore have high social management capacity (Ahmed
and Mustafa, 2007). However, another's high capacity may impinge on others causing
vulnerability for them in terms of access to resources.

Morgan (2006, pp.6-7) suggests that the concept of capacity consists of five central aspects:
the first is that of empowerment and identity, which enables survival, growth, diversification
and increasing complexity; the second, collective ability, which allows for a system to
perform, establish relationships, deliver value, and renew itself; thirdly, capacity as a
condition is a systems phenomenon – it emerges from the positioning of a system within a
specific context; fourthly, capacity is a potential state in that it is elusive, transient and
latent, and is therefore hard to induce, manage and measure; and finally, capacity is about
the creation of public value. Although these characteristics are useful in illustrating capacity
as the ability to do something, however, this tells us little about what that ability might be.

To reconcile this deficit, Morgan (2006, p.8) states that capacity can be conceptualised as having five core capabilities as a foundation in all systems.

2.8.2 Capabilities

Understanding capabilities as determining the abilities of a system or organisation to do something (i.e. their capacities) can help make the concept of capacity more operational. In his case research, Morgan (2006, pp.9-16) identifies five core capability categories, which are the capability to act, to relate, to generate development results, to integrate, and to adapt. An additional capability is the capability to mitigate, as identified by Winkler *et al.,* (2007). All are considered necessary, and all are insufficient alone to ensure overall capacity. They may be present in varying degrees in different organisations or systems, but organisations or systems try to balance all five in order to maximise their capacity (Morgan, 2006, p.8).

The first is about the capability to act deliberately and to self-organise with some sort of strategic intent. It is about human, social, organisational and institutional dynamism, and involves a complex combination of motivation, commitment, space confidence, security, meaning and values (Morgan, 2006, p.9); this requires the system to be conscious and aware of its place in the world, to configure itself, to develop its own identity and then to act (Homer-Dixon, 2003). A number of issues are connected with the ability or inability to act; for example, the degree to which decisions are implemented, the integrity, leadership and staff of the organisation or system, the action orientation within the system, the degree and use of operational autonomy, and the degree to which effective human, institutional and financial resources can be mobilised. If this capability is limited, systems may be unresponsive and unwilling. If this is the case, some actors may have this capability, but frequently use it to maintain the power and control of government and its supporting elites (Brinkerhoff, 2007, p.6). Action may be directed by and for specific interest groups involved in win-lose tactics, where its purpose may be to achieve and/or withhold power and resources from others. The challenge here is to expand this capability across societal groups, encourage participation, engagement, and inclusion, and permit accountability checks on the powerful (Brinkerhoff, 2007, p.6).

Secondly, the capability to relate (Morgan, 2006, p.13) emphasises that capacity is more than goal achievement and programme delivery - it is also about support and protection of systems, resource leverage through partnerships and alliances, and the importance of gaining legitimacy and operating space (Brinkerhoff, 2005). A number of issues influence this capability; for example, the degree of legitimacy in the eyes of various stakeholders, the ability to protect the system's core interests, and the operational autonomy. However, focus on this capability at the expense of the other four can limit the system's ability to experiment and innovate, thereby sacrificing performance efficiency. This capability is often limited to intra-group bonding as opposed to inter-group bonding, thus limiting the propensity within a system that could promote revealing common interests, joint problem solving and conflict mitigation (Brinkerhoff, 2007).

The third, the capability to generate development results (Morgan, 2006, p.10), can be constituted in various ways; for example, development results as improved capacity itself, or development results as programmatic (in terms of outputs and outcomes). Factors that influence this capability are the strength of public institutions and services, and the extent to which substantive outcomes, such as better education, can be generated. If this capability is weak, it can contribute to poor economic performance, low human social development, and distributional issues. If patterns of favouritism emerge, are institutionalised and continue over time, they may,

> "Foster dependency, patron-client relationships, exploitation, social divisiveness, and the build-up of grievances among those excluded" (Brinkerhoff, 2007, p.6).

This is the most commonly known and referred-to form of capability, without the other four it is likely to be ineffective (Morgan, 2006). The reasons for this are that, by itself, it tends to ignore already present resources and strengths, instead focusing on surface level symptoms of weak capacity as opposed to deeper causes; it emphasises the development of functional capabilities, such as service delivery, at the expense of other, non-technical, capabilities such as institutional, organisational and systems change (Morgan 2006, p.11) which limits the sustainability of the technical aspects over the long term; and alone, it shifts the idea of capacity away from the dynamism and 'process' of the concept towards seeing it only as contributing in some way to improved results – therefore outcomes may be considered as a proxy for capacity.

Fourth is the capability to integrate and achieve coherence (Morgan, 2006, p.16). All organisations and systems consist of different actors, units, and skills, but these must attain a level of connectivity (unity) that will prevent the loss of focus and the potential to break apart. The issues that are related to this capability are the particular integrating structures that exist inside the system, the extent to which there is a shared vision of the organisation's or system's intent, how well-defined the governing rules are, and the extent to which the leadership of the organisation or system is intent on achieving coherence. States with fragile environments may have culturally embedded systems. These may be internally coherent, with high degrees of resilience and legitimacy; however, they,

> "Can make society-wide coherence problematic in that they tend to serve parochial interests in competition with others, and can limit a society's ability to adapt and self-renew for purposes of socio-economic development" (Brinkerhoff, 2007, p.7).

The fifth core capability is the capability to adapt and self-renew (Homer-Dixon, 2003) or, more commonly, adaptive capacity (Ensor and Berger, 2009). According to Chapin *et al.*, (2006, p.16641) adaptive capacity includes the ability of actors within a particular human and environmental system to respond to changes, shape changes, and create changes in the system. Ensor and Berger (2009, p.17) list a number of elements and issues that are associated with adaptive capacity, which include the tangible assets that are available (financial and natural resources), the less tangible elements that are present (skills and opportunities to make decisions and implement changes), the extent to which an adaptive management culture exists, the extent to which there is ability, opportunity and discipline to learn, the degree of confidence to change, and the extent of ability to balance stability and change; the world is constantly changing – economically, politically, socially, and environmentally – and the precise constituent elements and issues of an organisation or system are important in determining its ability to adapt to world changes. Ensor and Berger (2009, p.18) state that diversity supports adaptive capacity by providing communities with options during periods of stress and change; it is described as an 'attribute' that provides a potential array of alternatives for an uncertain future. In addition, adaptive capacity has often been claimed to involve the ability to experiment or innovate and the capacity to learn (Peterson, 2000, p.328; Chapin *et al.,* 2006, p.16641). The most adaptive societies have actors with the capacity to experiment, so Ensor and Berger (2009, p.19) suggest that technical training and experience are essential elements to ensure that resources are put to

productive use. However, experimentation and learning will depend upon contextual factors, such as having the institutions in place to support these activities (Patt, 2008).

Chapin *et al.*, (2006) mention that adaptive capacity ultimately depends on the context in which the organisation or system is operating in terms of the level and diversity of social and kinship networks, institutional environment, entitlements and political influences that govern how capital is distributed and used (Chapin *et al.*, 2006, p.16641; Smit and Wandel, 2006, p.286). For example, Cross and Parker (2004, p.9) identify that social networks provide an opportunity for sharing experiences, promoting learning, influencing changes in behaviour and enhancing collaboration in innovation. Shared experiences and learning can help the real and perceived risk of adopting changes to livelihoods through observing and understanding other experiences (Ensor and Berger, 2009, p.20), and this is more dominant in decision-making than 'analytically-based reasoning', which is more responsive to authoritative, external information (Balstad, 2008, p.166). Wasserman and Faust (1994, p.4) list three concepts that can be used to analyse and understand social network links between different actors; these are interdependency, relational ties (which can be channels for the flow of resources) and the network structural environment (which can create opportunities or impose constraints on individual action). Moser (2008, p.188) suggests that it would prove useful to examine the social dynamics that motivate, facilitate and constrain ground-level adaptation strategies and actions in decision-making institutions and specifically deal with value judgements and power dynamics embedded in adaptation decisions. Context can operate on a number of different scales - for example, certain elements of adaptive capacity could be local; however there are broader, even global, social, economic and political elements (Smit and Wandel, 2006, p.289) such as free trade agreements and subsidies.

Finally, Winkler *et al.*, (2007) suggest that the capability to mitigate, also known as as mitigative capacity is important. Mitigative capacity reflects an actor's ability to reduce the intensity of the natural or other stresses to which it might be exposed (Banuri and Weyant, 2001, p.103). The IPCC (2007, n.p.) lists the following mitigative capacity determinants at the national level:

- Range of viable technological options for reducing emissions;

- Range of viable policy instruments with which the country might affect the adoption of these options;
- Structure of critical institutions and the derivative allocation of decision-making authority;
- Availability and distribution of resources required to underwrite the adoption of mitigation policies and the associated broadly-defined opportunity cost of devoting those resources to mitigation;
- Stock of human capital, including education and personal security;
- Stock of social capital, including the definition of property rights;
- A country's access to risk-spreading processes (e.g., insurance, options and futures markets);
- The ability of decision-makers to manage information, the processes by which these decision-makers determine which information is credible, and the credibility of decision-makers themselves.

2.8.3 Dimensions at which capacities occur

When an actor lacks one or more of these capabilities, or when the balance between the capabilities is inappropriate for a given actor, that actor's capacities are likely to be inefficient, ineffective and unsustainable, and so the ability of the actor to achieve a specified goal is likely to be compromised, as indicated in the above discussion. However, although the capacities that an actor possesses, and the strength of these capacities, influence an actor's performance, actors and their capacities do not exist in a vacuum; rather, they are embedded in complex environments that influence their ability to carry out tasks effectively and efficiently, and achieve their objectives. Hindlebrand and Grindle (1994) indicate five dimensions at which capacities occur, that affect capacities, and so influence the actor's performance: the action environment, the institutional context, the task network, organisations, and individuals. Each of these dimensions constrains or facilitates the ability of actors to achieve a given outcome in different ways based on their constituent factors.

The action environment refers to,

> "The economic, social, and political milieux in which organisations [and other actors] attempt to carry out their activities" (Hindlebrand and Grindle, 1994, pp.8-17).

There are a number of factors to be considered that may impact the ability of an actor to carry out a given task, which include *economic* factors, such as conditions in the labour market and international markets, the extent of development assistance, and the level and growth rate of GNP; *political* factors, such as the extent to which civil society is politically

mobilised, the level of legitimacy and stability within the system, and the nature and development of political institutions; and *social* factors, such as overall level of human resource development in the country, the degree of tolerance among social groups, and the degree of participation in life at regional, local, and national levels (Hindlebrand and Grindle, 1994). Capacities at this level include policies, legislation, policy instruments, power relations and social norms, and the legal framework. All of these govern the,

> "Mandates, priorities, modes of operation and civic engagement across different parts of society" (UNDP, 2008, p. 6).

The second dimension of capacity is the institutional environment. This dimension provides the framework that influences the ability of all actors within the given institutional environment to operate and deliver (UNDP, 2008, p.6). This level of capacity includes the institutional infrastructure, quality of governance, professional institutions, internal arrangements, procedures and frameworks. It also includes laws and regulations that define responsibilities and power relationships among actors. An example of the policies that may hinder the achievement of particular tasks is structural adjustment programmes, which will significantly affect the ability of a government to carry out certain tasks.

> "A third dimension of capacity relates to the coordinated activities of several organisations that are required to accomplish particular tasks – the task network. The interactions of organisations within this network can facilitate or constrain organisational performance" (Hindlebrand and Grindle, 1994, pp.8-17).

How networks function and the nature of the formal and informal interactions that exist among them are important determinants of organisational performance for certain activities. For example, Ahmed and Mustafa (2007) identify that the social networks people belong to, particularly through networks of relatives, helps their ability get credit. An actor can belong to more than one task network. Capacities in this dimension relate to the ability of organisations and individuals to negotiate, form and keep to conditions of partnerships.

> "A fourth dimension of capacity focuses on organisational structures, processes, resources, and management styles that affect how individual talents and skills are used to accomplish particular tasks" (Hindlebrand and Grindle, 1994, pp. 8-17).

This level of capacity comprises the internal policies, arrangements, procedures and frameworks of a given organisation that allow it to operate and deliver on its mandate, and enable the coming together of individual capacities to work together to achieve goals

(UNDP, 2008, p.6). Organisations establish goals, structure work, define authority relations, and provide incentives and disincentives that shape the behaviour of the individuals working within these organisations. In addition, they provide the environment, and the resources, that may either facilitate or hinder the development of skills. Being members of a group or organisation can lead to a greater propensity for mobility, literacy and sufficient access to resources, and thus enables people to have greater individual capacities.

The final dimension of capacity is the individual level. Capacities at this level refer to human resources, skills, knowledge and experience, some developed through formal education and training, and some through practical experience (UNDP, 2008, p.6). In relation to the public sector, this level refers to the capacity of the individual public sector employees (Grindle and Hilderbrand, 1995). For example, in their research, Ahmed and Mustafa (2007, p.82) mention that, in group discussions in Tamil Nadu and Gujarat, they found that gender differences were prevalent in the context of activities, such as learning to swim: men generally knew how to swim, whereas women were never taught and their clothing constricted their ability to swim. These gender differences subsequently impact movement when reacting to cyclones, storms and flooding.

2.9 CHAPTER SUMMARY AND CONCLUSION

This chapter examined the development of the SIDS category, and their common characteristics, such as small resource sets; delicate (fragile) land and marine eco-systems which have a relatively high vulnerability to natural disasters; high transportation costs, and high communication costs. Then the chapter explored the socio-economic models of SIDS that have helped identify common features that link some SIDS within the overall category together into subgroups. From this it was identified that a significant number of SIDS depend on tourism to a great extent, and therefore rely on their natural assets for economic growth. This chapter recognised the economic importance that tourism brings to SIDS, because it contributes to exports, job creation, tax revenues, GDP, investment, and foreign exchange earnings. The variation between SIDS may differ in terms of their geography (land area size, population size, height above sea level) economy (debt levels, tourism's contribution to exports, number of annual tourist arrivals) and environmental pressures

(precipitation, temperature, volcanic activity, storms, increasing pollution, lack of water resources, coastal erosion, coral bleaching, deforestation).

Furthermore, the chapter elucidated the vulnerable nature of SIDS, because they can be economically, environmentally and socially vulnerable. SIDS are exposed to unique vulnerabilities and these make SIDS more prone than other developing states to damage from phenomena such as exogenous shocks, natural disasters and extreme weather. However, although SIDS may be vulnerable to certain conditions, this does not necessarily mean that they are unable to cope, react, or develop their systems to deal with exogenous shocks. Resilience is something that SIDS may have naturally and something which they will also need to develop. Resilience can be developed through adaptation strategies, such as conducting in-depth studies on natural environmental impacts specifically in terms of biophysical and socio-economic impacts, use of building codes, and improved building codes. In order to mitigate vulnerability and enhance resilience, this will depend upon the level to which the community/society is capable of organising itself and the ability to increase its capacity. Therefore the ability to adapt is influenced by capacity. The central characteristics of capacity include the following: to act, to relate, to generate development results, to integrate, to adapt and to mitigate. The capacities that an actor has and the strength of these capacities influence performance; however, actors and their capacities are embedded in complex environments that influence their ability to carry out tasks effectively and efficiently, and achieve their objectives. The dimensions at which capacities occur affect capacities, and so influence actors' performance are the action environment, the institutional context, the task network, organisations, and individuals. There are a multitude of climate change and non-climate change environmental issues that SIDS may encounter and before action can be taken, there needs to be clear understanding of these issues.

CHAPTER 3 –ENVIRONMENTAL ISSUES AND THEIR CONSEQUENCES FOR SIDS

3.1 INTRODUCTION

This chapter examines both climate change and non-climate change environmental issues that impact SIDS. First, the chapter examines the environmental issue of climate change and its general impact on the physical environment. Second, it explains climate and non-climate change related outcomes for SIDS. Finally, it discusses specifically non-climate change related environmental challenges to SIDS.

3.2 THE ENVIRONMENTAL ISSUE OF CLIMATE CHANGE

Increasing greenhouse gas (GHG) emissions, such as carbon dioxide and methane, largely resulting from increases in carbon-emitting anthropogenic activities, are already potentially affecting climate change. This is indicated through changes in surface air temperatures, precipitation, changes in extreme events (such as tropical storms), ocean heat content, ocean salinity, ocean pH, and sea level. SIDS are no exception to these trends.

Trenberth *et al.,* (2007, pp.241-242) analysed multiple measures relative to the period 1961-1990, and show that there has been a significant increase since 1980 in global land-surface air temperature (see figure 3.1 below).

FIGURE 3.1: Annual Anomalies of Global Land Surface Air Temperature (^{o}C), 1850-2005, relative to the Mean for 1961-1990. CRUTEM3, NCDC, GISS, and Lugina *et al.,* (2005) are the different studies that this graph is composed of. (Source: Trenberth *et al.,* 2007, p.242; Original in Colour)

Trenberth et *al.,* also reported an increase of sea-surface air temperature, relative to the 1961-1990 mean in figure 3.2 below. Both figures 3.1 and 3.2 provide evidence that the world has experienced an increase in climate change over recent decades.

FIGURE 3.2: Latitude-Time Sections of Zonal Mean Sea-Surface Air Temperature Anomalies (^{o}C) 1900-2005, relative to 1961-1990 (Source: Trenberth *et al.,* 2007, p.247; Original in Colour)

Projections of annual mean temperature changes suggest that by the 2050s, temperature in SIDS regions will have increased by between 2.0^{o}C and 2.8^{o}C, and by the 2080s, the increase would be between about 3.0^{o}C and 4.3^{o}C (Nurse and Sem, 2001, p.851), see table 3.1. The Mediterranean SIDS are expected to experience the greatest rise in temperatures, followed by the Indian Ocean SIDS. Nurse and Sem (2001, p.852) do suggest that although increases will be fairly uniform across the seasons, increases in temperature will be more marked in minimum temperature than maximum temperature in SIDS regions, meaning temperature range will fall; however, the frequency of extreme temperatures is likely to rise in all regions, so an "increased likelihood of thermal stress conditions" for SIDS.

TABLE 3.1: Annual Mean Climate Change Predictions for SIDS for the 2050s and 2080s.

Regions	Annual Mean Temperature Change (°C)				Annual Mean Precipitation Change (%)			
	GHG	GHG+A	GHG	GHG+A	GHG	GHG+A	GHG	GHG+A
Atlantic Ocean and Caribbean	2.03 (±0.43)	1.71 (±0.25)	3.06 (±0.84)	2.64 (±0.61)	-5.2 (±11.9)	-1.3 (±7.8)	-6.8 (±15.8)	-0.7 (±12.3)
Pacific Ocean	1.98 (±0.41)	1.63 (±0.23)	2.99 (±0.87)	2.54 (±0.63)	5.5 (±2.5)	4.9 (±0.8)	7.6 (±3.3)	7.0 (±1.9)
Indian Ocean	2.10 (±0.43)	1.64 (±0.23)	3.16 (±0.89)	2.61 (±0.65)	3.1 (±4.5)	1.6 (±3.9)	5.1 (±4.3)	4.3 (±4.9)
Mediterranean	2.83 (±0.62)	2.31 (±0.29)	4.27 (±1.26)	3.57 (±0.83)	1.0 (±11.0)	-2.4 (±8.6)	4.3 (±14.9)	-0.1 (±12.9)

 (Source: Nurse and Sem, 2001, p.851)

GHG Greenhouse Gases
A Aerosol Forcing (aerosols, if they are reflective, have a cooling effect, so it is included here to provide an additional scenario)

Trenberth *et al.,* (2007, pp.255-256) found no single global trend; they identified variations per region, for example: South America has experienced increasingly wet conditions over the amazon basin, and negative trends over Chile; while northwestern India has experienced a strong decrease in annual precipitation. Furthermore projections on precipitation change indicate only a very small increase or decrease in annual rainfall, resulting from increases in concentrations of GHGs in the atmosphere. The Pacific Ocean SIDS are predicted to experience the highest increase in rainfall – a 5.5 % increase by the 2050s, and about 7.6 % by the 2080s – whereas the Atlantic Ocean and Caribbean SIDS are expected to experience a fall in precipitation –approximately 5.2 % by the 2050s and 6.8 % by the 2080s. Lal *et al.,* (2002) claim that there is likely to be, in all regions, lower numbers of annual rainy days, implying a greater frequency of droughts experienced by SIDS.

Yamamoto and Esteban (2011) stated that,

> "One of the fears of global warming is that it might result in an increase in the frequency and intensity of tropical cyclones due to the increases in surface sea temperatures" (p.14).

 A cyclone (Indian Ocean), hurricane (America) or typhoon (Asia Pacific) is a storm consisting of low pressure in the centre, accompanied by thunderstorms, strong winds and heavy rain; it is the result of the heat released when moist air rises, with the water vapour within this air condensing (Yamamoto and Esteban, 2011, p.16). As the global atmosphere warms due to increasing GHG emissions, many researchers and scientists contend that there will be

increases in cyclone intensity (Webster *et al.,* 2005; Elsner *et al.,* 2008). For example, ESCAP (2010, p.25) claims that the number of cyclones has increased in the southwest Pacific in the past 50 years, with an average of four every year, and wave heights of the latest cyclones have surpassed current climate-change model forecasts. Wave patterns are estimated to be variable with increasing intensity of cyclones; for example, Nobuhito *et al.,* (2010) claim that there will be a lower mean wave height in middle latitudes, and a higher mean wave height in the high latitudes and equatorial areas on a daily basis as a result of climate change, so suggesting that changes in wave height will not only be the result of increases in cyclone intensity, but part of the process initiated by the increasing rate of climate change. However, extreme wave heights are expected to increase during cyclones due to their increasing severity. In addition, an analysis of the trends of cyclone maximum wind speeds found a significant ascending trend for wind speed quintiles above the 70th percentile (Elsner *et al.,* 2008); although there are concerns over the accuracy of the satellites on which these projections are based (Landsea *et al.,* 2006). Therefore, despite the general agreement on increases in cyclone intensity due to climate change, there are still numerous uncertainties; Pielke (2007) points to how nine scholars have given predictions varying from 0 to 36 % increase in cyclone intensity by 2100, which is a large range from which to draw definitive conclusions.

Climate change is also associated with increases in the ocean heat content. Ishii *et al.,* (2006), Levitus *et al.,* (2005) and Willis *et al.,* (2004) offer a time series of ocean heat content, with the latter for the 0-750m ocean layer for the period 1993-2005, and the former two for the 0-700m layer of the World Ocean for the period 1955-2005; see figure 3.3 below.

This time series indicates a general upward trend in ocean heat content over the period; the yearly fluctuations, as Bindoff *et al.,* (2007,) claim, are only small and are due to variations in quality control and the data employed. From the two long time series for the 0-700m ocean layer, Bindoff *et al.,* (2007, p.390) calculate the change in the heat content for the 1961-2003 period to be 8.11 $\pm$ 0.74 x 10^{22}J, which corresponds to an average warming of 0.1$^{\text{o}}$C. There is also a strong correlation between Levitus *et al.,* (2005) 0-700m and 0-3,000m time series, indicating that warming extends deep into the ocean, although Bindoff *et al.,* (2007) suggest that 69 % of ocean heat content increase is found in the upper 0-700m layer, and

state that, during the period 1961-2003, the 0-3,000m layer experienced an average increase in heat content of 0.037^{o}C.

FIGURE 3.3: Time series of global annual ocean heat content (1022J). The black curve represents the findings from Levitus *et al.,* (2005) with the shaded area showing the 90% confidence level. The green curve shows the results from Ishii *et al.,* (2006). The red curve represents the findings from Willis *et al.,* (2004) (Source: Bindoff *et al.,* 2007, p.390)

Increases in climate have substantially increased ocean water evaporation and reduced the amount of rainfall over large expanses of ocean; this results in an increase in ocean salinity (Bindoff *et al.,* 2007). Changes in salinity differ depending on the region, which is largely due to changes in precipitation amounts in the different regions; for example, the Pacific Ocean has been freshening overall, whereas the Indian Ocean and the Atlantic Ocean have experienced increasing salinity; see figure 3.4 below.

The ocean naturally takes up anthropogenic carbon; however, with increasing carbon dioxide emissions, the ocean is taking up increasing quantities of carbon dioxide. Dissolved carbon dioxide forms a weak acid, so as carbon dioxide increases, the pH of the ocean decreases (i.e. becomes more acidic). Bindoff *et al.,* (2007, p.404) provide evidence of increasing oceanic partial pressure of carbon dioxide, and of a downward trend in ocean pH, as illustrated in figure 3.4, from three time series stations. Kench *et al.,* (2009) claim that the

pH of tropical surface water has declined from 8.2 in the pre-industrial period to 8.1 at present-day levels.

FIGURE 3.4: Trends of Zonally Averaged Salinity in PSU (Practical Salinity Unit) for 1955-1998 in the Upper 500m of the Atlantic, Pacific, Indian and World Oceans. The Dark Solid Line is the Zero Contour; Red Shading Illustrates Values Equal to or Greater than 0.005psu per Decade; Blue Shading Illustrates Values Equal to or Less than -0.005psu per Decade (Source: Bindoff *et al.,* 2007, p.394)

ESCAP (2010, p.24) claims that sea level rise is amongst the greatest anticipated consequences of global warming. An increase in global temperature causes ocean temperatures to also rise, resulting in its expansion, which in turn increases ocean volume. In addition, an increase in temperature also causes polar ice and glaciers to melt, further increasing sea volume (Yamamoto and Esteban, 2011, p.8). Both these occurrences result in the rising of sea levels. Although fluctuations in sea level occur naturally, Solomon *et al.,* (2007) claim that the rapid rise in GHG emissions from anthropogenic activities has been causing a much-increased rate of sea level rise. Bindoff *et al.,* (2007, p.409) provide evidence, using estimates from the past, instrumental records, and projections of the future, that shows that the rate of sea level rise is increasing. They claim that sea level did not change significantly during the nineteenth century; it rose at a rate of approximately

1.7mm per year during the twentieth century, but since 1993 it has been rising by a rate of about 3mm per year. They also predict that by the mid-2090s, the rate of sea level rise will reach 4mm per year. These trends provide evidence for rising sea levels, and that this is occurring at a greater rate over time. Due to differences in ocean density and water circulation, actual sea level rise will differ per region; for example, Woodworth (2005) suggests that the Maldives is likely to experience sea level rise of about 50cm by the end of the twenty first century, whereas Vermeer and Rahmstorf (2009) claim that global sea rise could be a more extreme 0.81 to 1.79m.

A substantial rise in sea level puts the viability and survival of some SIDS at risk, particularly if they are low-lying and flat; for example, the Maldives has an average height above sea level of 1.5m, so if Woodworth (2005) is correct, by the end of the twenty first century the Maldives may have a significant proportion of its land area submerged. A rise in sea level has a number of other – indirect – severe consequences for SIDS, which are discussed below.

MCEDAP (2000) points out that the outcome of multiple studies and a mounting corpus of qualitative and anecdotal evidence shows that climate change, and the other associated characteristics, are already causing substantial damage to SIDS, and threatening the physical well-being and economic survival of island communities.

3.3 CONSEQUENCES OF CLIMATE CHANGE AND OTHER NON-CLIMATE CHANGE OUTCOMES FOR SIDS

3.3.1 Storm Surges and Flood Risks

As discussed in 3.2 one of the anticipated outcomes from climate change is the increased intensity and frequency of extreme weather events, and rising sea levels. The severity of the threat posed by these occurrences, and the resulting damage caused due to them, will vary substantially depending on elements such as,

> "Local coastal geometry, the atmospheric storm intensity or the location of human settlements" (Yamamoto and Esteban, 2011, p.14).

However, current projected magnitudes indicate that low-lying deltas, coral atolls and reefs are particularly at risk from the high winds, high precipitation, high waves, storm surges and

flooding of cyclones and increased sea levels (UNEP, 2004, p.9); therefore these occurrences are anticipated to disproportionately influence the economic and social development of SIDS (Granger, 1997; IPCC, 1998). For example, in 2004, Grenada was devastated by Hurricane Ivan, which damaged or destroyed approximately 90 % of hotel rooms and 80 per cent of the total nutmeg trees – both of which are the island's main exports – and caused massive damage to the socio-economic infrastructure of the island (Mimura *et al.,* 2007).

The predicted increase in mean sea level indicates that current maximum sea level heights are likely to be reached more often, and maximum sea levels are likely to increase (Nurse and Sem, 2001). Increases in the strength of cyclone winds are also likely to result in increases in storm-surge heights. These prospects imply a significant increase in land area threatened with inundation, particularly in,

> "Areas with a small surge envelope, which is typical in most small islands" (Nurse and Sem, 2001, p.856).

Even incremental elevations in sea level of a minimal magnitude are likely to have severely negative effects on atolls and low-lying islands (Forbes and Solomon, 1997; Nicholls *et al.,* 1999). Indeed, Leatherman (1997) argues that land loss due to flooding caused by sea level rise will probably be so extreme that it will disrupt practically all of the economic and social sectors in SIDS. For example, Mimura and Pelesikoti (1997) estimate that with a 1m sea level rise, 10.3 km2 of land in Tonga would be submerged; this is likely to increase to 37.3 km^2 with storm surges. Holthus *et al.,* (1992) project a loss of 65 hectares of land from the Majuro Atoll of the Marshall Islands with a 1m sea level rise.

Cyclones, storm surges and flooding present numerous issues and challenges for SIDS; Yamamoto and Esteban (2011, p.14) place these into two categories – firstly, "direct damage to human habitation and infrastructure", which is considered as direct economic damage, and secondly, "damage to the surrounding environment and ecosystems".

Regarding the first, in the case of SIDS, a majority of the countries infrastructure, housing and industry (tourism and agriculture) are often located near coastal areas, and so are vulnerable to flooding and sea surges resulting from sea level rise, increased intensity of cyclones, and other extreme events that cause high water surges, such as tsunamis. Wassmann *et al.,* (2004) predict that even with only a 40cm rise in sea level by 2100, there is

expected to be an increase in the number of people experiencing flooding in coastal areas from 13 million to 94 million. This huge escalation is supported by Nicholls *et al.,* (1999) who predict that many coastal areas will probably experience annual, or a rise in the frequency of, flooding, with SIDS in the Caribbean, the Indian Ocean and the Pacific Ocean in particular at a greater risk of flooding; they estimate that 200 times the number of people in these areas currently facing the risk of floods will be reached by the 2080s. Particular problems caused, as claimed by UNEP (2004, p.10), are that sanitation, storm-water drainage and sewage disposal systems may be disrupted; this can have major consequences for human health (see section 3.3.10). Yamamoto and Esteban (2011, pp.9-10) argue that, for many countries, inhabitants have the opportunity to move inland, or "attempt costly sea defences", when faced with the flooding of coastal areas, which would result in economic losses; but in low-lying SIDS, these strategies may not be feasible, "neither... certain to guarantee the long-term survival of the countries", and inhabitants may be forced to leave their homeland.

In relation to damage to the surrounding environment and ecosystems, storm surges and flooding erodes coastal areas (see section 3.3.1 and 3.3.2), affecting their inhabitability, and possibly damaging coral reefs, which are crucial to the survival and development of some SIDS (see section 3.3.3). Inundation by storm surges and flooding often increases the salinity of soils, so reducing their,

> "Productivity till they are eventually unable to sustain any vegetation or crops" (Yamamoto and Esteban, 2011, p.19).

This is particularly damaging to SIDS' productivity due to the concentration of activity in coastal areas. In addition, storm surges and flooding contaminate freshwater supplies, as seawater will have an increased ability to infiltrate subterranean water tables (UNEP, 2004, p.9).

Rises in sea level, and increases in the intensity of extreme weather would further exacerbate these effects, placing SIDS' ecosystems under a great amount of pressure. In addition, the prospects of these occurrences will probably deter tourists and investors from these countries, again, putting greater strain on SIDS' economies.

3.3.2 Beach and Coastal Areas

A large proportion of the land area occupied by SIDS is coastal, and many industries are located here; therefore threats to these areas, such as sea level rise, storm surges and flooding, are likely to be a significant problem that SIDS face.

Beach and coastal erosion is the most common response of shorelines to sea level rise, flooding and storm surges. For example, Nurse and Sem (2001, p.857) report an average beach erosion rate of 2-4m per year in Trinidad and Tobago, where average sea level rise has been 8-10mm per year for 15 years. With increased areas of land being flooded, a greater amount of beach material is likely to be removed from coasts. Islands that are susceptible to flooding and storm surges may experience further stress to their natural and human systems that are located on the coast if there is an increase in storms (Nicholls and Hoozemans, 1996), and those that are not are at greater risk of this pressure on their coastlines. In addition, acidification of some areas of the sea as a result of increasing carbon dioxide emissions will also contribute to the dissolution of coasts, particularly with greater land inundation. Kench and Cowell (2001) used a modified shoreline translation model, and found that sea-level rise will result in ocean shores being eroded and sediment re-deposited further towards lagoons, assuming a constant sediment volume. There is, however, inconsistency in some predictions; for example, Dickinson (1999) claims that some islands in the Pacific will experience chronic island erosion as a result of increased water depth with climate change and sea level rise; but Kench *et al.,* (2005) provide evidence to suggest that uninhabited islands in the Maldives are resilient systems and will probably persist under present scenarios of sea level rise and global warming. Therefore, they suggest that islands subject to human modification are more vulnerable than those which are not. Simulations also show that sediment-supply alterations can cause atoll islands to physically change by an extent that corresponds to or is greater than that likely to be caused by only sea level rise.

Anthropogenic factors, such as sand mining, are also a major cause of coastal erosion, and are already a significant problem for many SIDS (Nurse and Sem 2001; Gillie 1997; Ragoonaden 1997). ESCAP (2010) supports this point by stating that coastal zone usage and activities within it – such as,

> "Coastal construction, port development, sewage and waste disposal, coastal protection, fishing, sewage/waste treatment, agriculture, logging, mining" (ESCAP 2010, p.24).

This presents a number of threats to marine and coastal resources; for example, eutrophication, soil erosion, sedimentation, coastal erosion and physical environmental alterations. Forbes and Solomon (1997) attribute coastal erosion to multiple human-induced causes, such as the loss of the mangrove fringe and other natural aspects that act as protection.

The erosion of SIDS' shorelines from a combination of these factors brings about serious stress and damage to the natural and built environments, the overall economic consequences of which are currently not possible to determine definitively; but one of the consequences is that SIDS vulnerable to these occurrences now experience considerable difficulty securing insurance coverage (Commission on Sustainable Development, 1996).

Beaches and coastal areas are, however, not passive rather respond dynamically in different ways dependent numerate factors, which include;

> "The geological setting; coastal type, whether soft or hard shores; the rate of sediment supply relative to rate of submergence; sediment type, sand or gravel; presence or absence of natural shore protection structures such as beach rock or conglomerate outcrops; presence or absence of biotic protection such as mangroves and other strand vegetation; and the health of coral reefs" (Mimura *et al.,* 2007, p.697. See also Nurse and Sem, 2001; Solomon and Forbes, 1999; Gillie, 1997).

Therefore, different SIDS are likely to have differing susceptibilities to coastal erosion, and experience, and respond to, coastal erosion differently. Islands on coral atolls are particularly vulnerable, and because they tend to be low-lying, the long-term viability of some atoll states will be under threat (Mimura *et al.,* 2007, p.698). For SIDS that are topographically more elevated, erosion to beaches will be less of a challenge to island survival, but may damage to coastal tourism facilities. Arctic islands, according to Mimura *et al.,* (2007, p.698), are extremely vulnerable to coastal erosion due to the warming of permafrost and widespread ground ice that can lead to an acceleration of erosion.

3.3.3 Coral Reefs

Atoll islands, such as Tuvalu, the Maldives, the Marshall Islands and Kiribati, are dependent on coral for their survival as it is the framework that supports the island. On many island

atolls and low reef islands, beaches are maintained by sand produced from productive reefs. Reefs are a very important natural resource for many SIDS (Nurse and Sem, 2001, p.857). Not only do reefs produce sand, they also are a source of food and building materials, and often act as natural breakwaters along coasts, thus minimising wave impacts in storms and cyclones. In addition, they are a tourism resource; for example, encouraging scuba diving. Furthermore, it is estimated that coral reefs support up to 25% of all marine life, which indicates it is important for biodiversity (ESCAP, 2010, p.24). Damage or destruction to coral reefs, therefore is a severe threat to the very survival of SIDS. Coral reefs are facing threats from both climate- and non-climate-related stressors.

Sea level rise alone does not pose the greatest long-term threat to the survival of atoll islands, but the incapacity of coral reefs to keep pace with this sea level rise (Reaser et al., 2000). Historically, coral reefs have been able to grow fast enough to keep up with the rising sea level, and atoll islands have survived due to the corals' sand production. Based on Warrick et al., (1996) predicted rates of sea-level rise of 2–9mm per year over the next 100 years, however it has been proposed that the risk posed to reefs (not islands) is insignificant, and that healthy reef flats will be able to keep pace with the rate of sea level rise, given an estimated upper limit of vertical reef growth of 10mm per year (Schlager, 1999). However, this ability to grow at the rate of sea level rise will be adversely affected by anthropogenic activities that weaken coral structures, and other effects of increased GHG emissions. For instance, Burke et al., (2011) estimate that approximately 60 % of coral reefs are under direct threat from local anthropogenic activities; when coupled with the effects of climate change, they propose that around 75 % of reefs are at risk.

Coral have very narrow temperature tolerance, so frequently live very close to their thermal limits and are highly vulnerable to changes in temperature (Goreau, 1992). The thermal tolerance of a number of species of coral is likely to be exceeded in the near future due to rises in sea-surface temperature and ocean heat content caused by global warming. Many researchers have provided evidence that episodic temperature increases of the sea surface lead to substantial "coral bleaching" (Brown and Ogden, 1993; Wilkinson and Buddemeier, 1994; Goreau et al., 1997; Reaser et al., 2000); this is characterised by corals losing their colourful appearance, and becoming white due to the loss of cells that contain zooxanthellae. Zooxanthellae play a crucial role in coral metabolism, and so their loss would

impede coral growth, indicating that it may not keep pace with sea level rise (Kench *et al.,* 2009). Significant episodes of coral bleaching in the previous two decades tend to be associated with an increase of ocean temperature by 1 °C or more (Nurse and Sem, 2001, p859), and mass bleaching is often the result of temperature variations of above 3oC or 4oC. An example of this occurred following the most recent El Niño episode in 1997–1998, with some islands had 90 % of their coral affected (Goreau and Hayes, 1994), when branched types most severely affected (Wilkinson, 1998). Nurse and Sem (2001, p.859) suggest that bleaching may occur yearly in most SIDS regions in the next three to five decades.

Different species, however, respond differently to an increase in temperatures, and have different tolerances to temperature. Yamamoto and Esteban (2011, p.11) suggest that, given time and assuming all other variables remain constant, the corals should be able to successfully adapt to a changing temperature. In addition, coral reefs may be able to recover from the effects of temperature increase, but increased GHG emissions means that temperature change may be too rapid with cooler periods being too short, and thus symptoms of increased GHG emissions may also negatively impact coral growth, so preventing coral adaptation and potentially leading to the disappearance of atoll SIDS.

One other symptom of increased GHG emissions, thought to have a negative impact on coral reefs, is ocean acidification. The IPCC (1998) suggests that increased carbon dioxide reduces the ability of reef plants to make their calcium carbonate skeletons that build the reefs; therefore, this would contribute to the inability of coral reefs to keep up with sea level rise (Kleypas *et al.,* 1999). The International Society for Reef Studies (2008) predicts that calcification rates will decrease by 12-48 % once carbon dioxide concentrations are twice preindustrial levels, so slowing skeletal growth. Furthermore, greater acidification will result in higher carbonate dissolution rates in water, adding to slower coral growth rates and negatively influencing the building of reefs (Kench *et al.,* 2009). From their study in Papua New Guinea, Fabricius *et al.,* (2011) found that at pH 7.8, coral reef cover is generally maintained, although coral diversity is significantly lower than at the current pH of 8.1; at pH 7.7, reef development terminates, and the environment typically becomes dominated by seagrasses.

Researchers point out that coral reefs are impacted by many non-climate-change stresses and disturbances, predominantly as a result of anthropogenic activities (Nyström *et al.,* 2000; Hughes *et al.,* 2003). Bryant *et al.,* (1998) categorises these as four human-threat factors,: coastal development, such as coastal resort development and the impact of tourism in Mauritius (Ramessur, 2002); marine pollution (see section 3.4.1); over-exploitation and destructive fishing - for example, blast fishing in the Indonesian islands (Fox and Caldwell, 2006), and subsistence exploitation of reef fish in Fiji (Dulvy *et al.,* 2004); and sediment and nutrients from inland - for example, nutrient pollution and resultant eutrophication from surface run-off in the Cocos Lagoon in Guam (Kuffner and Paul, 2001). Burke *et al.,* (2002) claim that areas whose coral reefs are most at risk from these activities are South-East Asia and the Caribbean, with 50 % and 45 % of their coral, respectively, classed in the high- or very high-risk categories.

If they are not subjected to the impacts of human activities and anthropogenic climate change, coral reefs may be able to keep pace with sea level rise (IPCC, 1998). However, the combination of an increase in sea temperatures, acidification, and anthropogenic activities make it highly doubtful that coral reefs will be able to keep up with the current rate of sea level rise (Westmacott *et al.,* 2000). These combined effects could therefore mean that some SIDS become completely uninhabitable in the not too distant future. It is important to establish, though, that impacts on coral reefs from all these factors will not be uniform throughout SIDS. There are likely to be local and regional differences in the scale and type of threats to coral reefs in both continental and small-island situations (Mimura *et al.,* 2007, p.698), based on coral species and local conditions.

3.3.4 Mangroves and Sea grasses

Other common features of SIDS' coastal areas are mangroves and seagrasses. Mangroves not only act as nesting places for birds and other animal life (Commission on Sustainable Development, 1996), but they also play an important in protection of coastlines against tides, cyclones, and storm surges, and are filters against the introduction of exotic insects (Menendez and Priego, 1994; Suman, 1994). Mangroves are, however, threatened by sea level rise. For instance, Perez *et al.,* (1999) predict that a 1m rise in sea level in Cuba would put more than 300 hectares of mangroves at risk; moreover sea level rise could result in the

comprehensive collapse of Jamaica's Port Royal mangrove wetland (Alleng, 1998). Furthermore, indiscriminate diving, fishing and boating, mainly originating from the tourism sector, could also contribute to mangrove damage. This loss and destruction of coastal mangroves could result in increased rates of coastal erosion and flooding (Mimura *et al.,* 2007).

Seagrasses provide habitats for many marine fish. There are a number of effects of increased GHG emissions that impact seagrasses: firstly, increases in sea-surface temperature are predicted to negatively affect seagrasses; secondly, Short and Neckles (1999) claim that changes in temperature are likely to alter sexual reproduction patterns and growth rates; thirdly, a rise in sea level would mean that there would be a reduced quantity of light reaching seagrass beds due to greater water depth, which would stunt plant productivity; and finally, increased carbon dioxide in the sea is likely to impact different species differently, and so change the competition between species (Beer and Koch, 1996). Seagrasses also face threats from other sources; for example, they are highly sensitive to land-based pollution and runoff (Edwards, 1995).

3.3.5 Biodiversity

SIDS frequently have a rich, unique biodiversity due to relatively high endemism caused by ecological isolation (Mimura *et al.,* 2007, p.700). For example, Vales *et al.,* (1998) report that in Cuba, 50 % of the flora and 41 % of fauna are endemic. Human livelihoods and well-being in SIDS are highly reliant on SIDS' distinct ecosystems services; for example, their income tends to be determined by the value of local amenities, fisheries and flows of tourists drawn to the destination partly because of its unique biodiversity (Wong *et al.,* 2005). Therefore, loss of biodiversity is a significant economic threat to SIDS, and, as the extinction of species can affect the dynamic interactions of ocean, coral, land and vegetation (UNEP, 2004, p.14), it is also a substantial environmental threat. Biodiversity faces a number of challenges from both the effects of increases in GHG emissions, and directly from anthropogenic activities.

An increase in temperature due to increased GHG emissions can have a significant impact on the biodiversity of SIDS. The isolated nature and endemism of many of their species has historically protected domestic species from extinction that could be caused by invasion by foreign species. However, Mimura *et al.,* (2007, p.700) claim that a rise in temperature may

enhance conditions that encourage the spread of invasive species; this could be accelerated by rapid climate change causing significant colonisation by foreign species which will have consequent impacts on island ecosystems. For instance, Frenot *et al.,* (2005) provide the example of sub-Antarctic island ecosystems, and how increasing temperatures are positively correlated with increases in alien microbes, animals and plants, and a corresponding fall in local biodiversity. In addition, temperature rise has been linked to the spread of marine and terrestrial pathogens, such as coral diseases (Harvel *et al.,* 2002).

Increases in carbon dioxide concentration in the atmosphere is predicted to enhance the productivity of some communities and changing competition between others by the extinction of some species and introducing new species (Nurse and Sem, 2001, p.859); this can significantly affect the environmental balance in SIDS, and force communities to have to change their practices and sources of income.

As discussed in chapter 2, SIDS are particularly vulnerable to increases in flooding and inundation due to sea level rise. Rises in sea level, and resultant flooding and inundation of low-lying forested areas on SIDS may result in the loss of some species by destroying their habitats. For example, it is estimated that a 0.5m rise in sea level in the Caribbean will cause a fall in the turtle-nesting habitat by approximately 35% (Fish *et al.,* 2005).

Species may also be negatively impacted by stronger and more frequent cyclones resulting from climate change, through physiological stress, and alterations and destruction of habitats. For example, Sattersfield *et al.,* (1998) state that the 30 % of the forested region on Santa Cruz island lost in a 1993 cyclone was the natural habitat to a number of endangered species, such as the New Caledonian lorikeet. Adaptation responses of forests on SIDS are expected to be slow; therefore the impacts of extreme weather events will possibly be cumulative. One consequence of damage to one species' habitat is that this may, in turn, affect other species; for instance, from their research in Samoa, Cox *et al.,* (1991) claim that a number of flowering plant species depend on flying foxes in the dry season for nearly all of their seed dispersal, so if the flying fox's habitat is at risk, many plant species may be lost.

Nurse and Sem (2001, p.859) state that the impacts of climate change and sea-level rise on biota in island states are much greater than the impacts on continental areas, mainly

because the isolation of SIDS reduces the ability of species to be replenished following an adverse shock. It has been stated that about 23 % of bird species on SIDS are under threat, whereas 11 % of the global bird species are threatened (McNeely *et al.,* 1993).

The long-term survival of biodiversity is also directly at risk from a number of anthropogenic activities, which include deforestation and the overexploitation of some plants for the development of industry, such as for agriculture and tourism; pollution emanating from tourism and other industries that may contaminate species' habitats, and kill them off; certain fishing practices which can endanger marine species - for example, driftnets capture targeted and non-targeted wildlife; and growing human populations which will necessitate an increase in the amount of land required for human activities, such as living space, and agricultural land to produce sufficient food.

3.3.6 Water Resources

The scarcity of fresh water is frequently a limiting factor for both the social and economic development in SIDS (Mimura *et al.,* 2007; Nurse and Sem, 2001). Many SIDS rely completely on a single source - for example, the Maldives and Tuvalu rely on rainwater; Barbados and Kiribati depend on groundwater; the Seychelles depends on rivers; and Singapore relies on surface reservoirs and imports (Nurse and Sem, 2001, p.860). This heavy reliance on one source makes SIDS particularly sensitive to changes in their freshwater supplies, most of which are dependent on rainfall for replenishment and to maintain adequate levels. Therefore, water resources in SIDS are highly vulnerable to changes in rainfall (IPCC, 2001), and it is likely that water demand will not be met in times of low rainfall.

Mimura *et al.,* (2007, p.695) state that a reduction in precipitation results in reduced amounts of water that can be physically harvested, reduced river flows, and fresh water lens taking longer to refill, consequently results in prolonged drought impacts. Using modelling, the World Bank (2000) has suggested that a 10% fall in average rainfall by 2050 is likely to correspond to a 20% fall in the size of the freshwater lens on Tarawa Atoll, Kiribati.

As indicated (in section 3.2), future changes in precipitation vary depending on the region, so SIDS do not face the same problems with their water supply. A number of researchers

have linked precipitation variability in various parts of the world to El Niño-Southern Oscillation (ENSO) events – a warming in the temperature of the surface of the Pacific Ocean, followed by a cooler period (La Niña), which occurs about every five years (Nurse and Sem, 2001; Mimura *et al.,* 2007). For instance, Falkland (1992) states that rainfall in the western Pacific during the 1982-1983 ENSO event reached only 10-30 % of the long-term average. In the Caribbean, droughts tend to occur more often in El Niño periods; and it tends to be wetter during La Niña periods (Nurse and Sem, 2001, p.861). These wet and dry cycles can have severe implications for the water supply and economies of SIDS. For example, the World Bank (2000) states that, in Fiji and Mauritius, water yield fell by 40 %in dry periods, which significantly affected export crops like sugar cane. Hay *et al.,* (2003) found that the 1998-2000 event caused acute water shortages in SIDS in the Indian Ocean and Pacific Ocean, and a partial shutdown of both the tourism and industrial sectors ensued. Therefore, in SIDS reliant on rainfall for their water, greater frequency and intensity of ENSO events resulting from climate change will put more pressure on already inadequate water resources (Meehl and Washington, 1996).

With large numbers of tourists, natural resources overconsumption is common. In addition, it is estimated that a tourist's consumption exceeds that of a local's (Dixon *et al.,* 2001). For example, McLaren (2003) notes that the daily freshwater needs of one tourist in Phuket, Thailand, significantly exceeds the estimated half-cubic metre necessity of an entire village community. This pressure on natural resources leads to serious difficulties, concerns and conflicts.

Freshwater competition between agriculture, industry and household uses is forcing it to become one of the most serious natural resource issues. This is exacerbated by the development of tourism, which is highly water-intensive (Neto, 2002, p.7). Pressures on freshwater supplies by tourism can lead to shortages, limiting its availability for food production and household uses, and leading to price rises. Furthermore, as Neto (2002), points out, a lack of freshwater supplies can limit,

> "Future tourism development in low-lying coastal areas and small islands that have a limited possibility for surface water and storage, and whose groundwater may be contaminated by saltwater intrusion" (p.7).

Therefore posing a threat to the tourism sector; it is not rainfall alone however that determines the amount of water available to SIDS residents and tourists. ESCAP (2010, p.25) notes that even in those regions experiencing high, or an increase in, levels of total rainfall, water is sometimes not available in SIDS due to inadequate storage. The Commission on Sustainable Development (1996) claims that this issue is most problematic in low-lying atolls as they have the little propensity o for surface-water catchment and storage; and of higher, volcanic SIDS, rainfall may be more abundant but their access to freshwater may still be limited due to inadequate storage facilities and infrastructure to deliver the water. Infrastructure deterioration, which often results in major leakages, contributes to this lack of access.

Sea level rise also has negative impacts on SIDS' water supplies. A decrease in individual SIDS land areas, due to the land loss that accompanies sea-level rise, will probably reduce the depth of the freshwater lens on atolls by as much as 29% (World Bank, 2000). Also, rise in sea level will possibly result in a shift in water-tables close to or above the surface, which will cause increased evapotranspiration, consequently diminishing the resource (Burns, 2000; Martin and Bruce, 1999). This, combined with falls in rainfall, will be a significant threat to SIDS' water supply; for example, in their 2000 study on islands in Kiribati, the World Bank indicated that a 0.5m sea level rise, along with a 25 % decrease in rainfall would produce a 65 % decline in the freshwater lens. Furthermore, some SIDS are experiencing salinisation due to over-pumping of aquifers; sea level rise is likely to increase this risk at coastal aquifers, and put freshwater lenses and inland freshwater-pumping plants at risk from salinity intrusion (Nurse and Sem, 2001, p.862).

Water resources also face problems of pollution from soil erosion, herbicide and pesticide runoff, and liquid and solid waste (Mimura *et al.,* 2007, p.697). Hajkowicz (2006) points out the substantial costs this imposes on SIDS; for instance, in Rarotonga, Cook Islands, this water pollution costs around 3 % on GDP. Water shortages often force atoll communities to use water that is polluted for drinking and cooking; this is linked to outbreaks of yellow fever, malaria and cholera (Hay *et al.,* 2003), thereby proving that polluted water often gives rise to serious health problems.

Water supply is becoming increasingly problematic not only because of the fall in supply, but also because of the increase in demand. Increases in population, agriculture and industry development and growth, such as tourism, are putting immense stress on current water resources; this is leading to excessive damming, over-pumping and increasing pollution in order to attempt to extract sufficient water, and is adding to the environmental problems of SIDS (Mimura *et al.,* 2007, p.697).

3.3.7 Agriculture and Fisheries

Subsistence agriculture in SIDS – with crops such as sweet potato, bananas and coconuts – is crucial to SIDS' economies, nutritional status, local food security and social well-being (Nurse and Sem, 2001, p.863). Dependence on the local ecology for food production varies between SIDS; for example, in Comoros it is 91 %, it is 85 % in the Seychelles, but it is only 37 % in Vanuatu (Ximena 1998). However, cash crops – such as sugarcane, coffee and rubber – are vital for the economic growth of SIDS as their export provides SIDS with foreign exchange (Mimura *et al.,* 2007, p.698). There are a number of problems that SIDS face when exporting cash crops. In addition, food production in general faces a number of challenges posed by the effects of climate change.

The problem with SIDS exporting cash crops is that they often depend on preferential access to richer country markets, which, due to the WTO directives, are restricted. In addition, over time there has been a,

> "Drop in competitiveness of cash crops, cheaper imports from larger countries, increased costs of maintaining soil fertility, and competing uses for water resources" (Mimura *et al.,* 2007, p.699),

Which all result in a fall in the contribution of agriculture to SIDS' GDP.

It is widely recognised that climate change is likely to have a number of negative impacts on SIDS' agricultural activities and food security. Drought, by substantially reducing the availability of water, often results in heat stress, evapotranspiration, reduction in soil moisture, and rise in soil temperature, and so reduces the ability of crops to grow, which in turn negatively affects SIDS economically. For instance, drought in Fiji during 1998 destroyed approximately 65 % of the sugar cane crop, with an estimated economic impact of 3 % of GDP (MCEDAP 2000). Jones *et al.,* (1999) claim that sugarcane and maize yields are

adversely impacted by rising carbon dioxide due to the warmer climate reducing soil moisture; this is supported by Singh and El Maayar (1998) who, by simulating carbon dioxide emission scenarios, estimate that sugarcane yields would decline by 20-40 % with a less-than-double carbon dioxide concentration increase in the southern Caribbean. The combination of extended periods of drought and periods of high rainfall will result in the loss of soil fertility and degradation, so lowering land productivity (Mimura *et al.,* 2007, p.699). Nurse and Sem (2001, p.863) point out that these outcomes are likely to be worse for those SIDS already facing difficult conditions, such as water scarcity.

The potential increase in intensity of cyclones due to climate change will most likely be accompanied with a substantial increase in damage to food crops and the associated infrastructure. For instance, in 1997 Tuvalu suffered three cyclones in quick succession, resulting in loss of land, inundation of taro pits and contamination of fresh water supplies, leading to a dramatic reduction in agricultural productivity (MCEDAP, 2000); cyclone Ofa in the Pacific in 1990 turned Niue from a food-exporter to one dependent on imports until 1992 (Wade, 2005); and Hurricane Ivan in 2004 caused agricultural losses worth approximately 10 % of GDP in Grenada, expected to impact foreign exchange earnings until 2014 (OECS, 2004).

The rise in sea level is also predicted to influence agriculture. On low-lying islands and atolls, a majority of crop agriculture is concentrated near the coast; therefore, changes in the height of the water lens and salinization of fresh water resources would cause further stress to island environments, especially for crops with a low salt tolerance (Nurse and Sem, 2001, p.863). Fishing is another important activity in SIDS, economically and in terms of food security, as it accounts for a substantial proportion of protein intake of SIDS inhabitants (Blommestein *et al.,* 1996). This resource also faces threats to its sustainability, both anthropogenic and climate-related. The former is related to high rates of exploitation significantly reducing fish stocks, and pollution making some regions uninhabitable.

Climate change is not expected to result in a reduction of the production of fishing; however, it may have important influences on the distribution and abundance of local stocks (Nurse and Sem, 2001, p.863). For instance, in their study of the Maldives, MOHA (2001) found that during the El Niño periods of 1972-1973, 1976, 1982-1983, 1987 and

1992-1994, skipjack tuna yields fell and yellow fin tuna rose, but that during La Niña periods the tuna catch was reversed. Mimura *et al.,* (2007, p.699) suggest changes in migration patterns and depth are two main factors affecting the distribution and availability of fish, furthermore, they anticipate that climate change will impact migratory patterns and this will influence tuna catch yields.

Breeding grounds for fish and shellfish that are important economically to SIDS are frequently found in shallow, coastal regions, abundant with coral, mangroves and seagrasses (Nurse and Sem, 2001, p.863). As previously discussed, all these elements are vulnerable to climate change.

3.3.8 Infrastructure and Settlements

In SIDS, settlements, industry, government buildings, important facilities (such as hospitals) and social activities are frequently located on or near the coast. Mimura *et al.,* (2007, p.700) indicate that this is often because atolls, particularly in the Pacific and Indian Oceans, are narrow, as a result of which communities have no other option but to locate their villages in coastal areas; Nurse and Sem (2001, p.864) claim that most infrastructure and population clusters on atolls are within 100m of the coastline. There is a similar pattern in the Caribbean, where approximately 50 % of the total population is within 1.5km of the coast (Mimura *et al.,* 2007, p.700). Due to the limited space, the high concentration of people in these areas, population growth and internal migration, there is intense competition for space, and significant pressure where the ecosystem is already fragile. This creates a number of problems for SIDS, such as pollution and waste disposal (see section 3.4.1). It also makes people more vulnerable to the effects of climate change.

The close vicinity of settlements to the coast means that any rise in sea level and increase in the frequency and intensity of cyclones is likely to negatively impact them through flooding, storm surges or inundation. Also, water movements that encroach further up the coast will probably result in erosion and damage to land, building and infrastructure – such as social services, roads, airports, tourist facilities, and ports – which will be very costly for communities and put their homes at risk.

Mimura *et al.,* (2007, p.701) make an important point in relation to housing in coastal settlements. SIDS' buildings are gradually shifting away from traditional styles, techniques and materials, which were often adopted with local context in mind, so were resistant to local damage and could be repaired rapidly. Buildings are shifting towards more modern, concrete-based structures that are vulnerable to thermal stress and damage through extreme events – such as tsunamis, earthquakes, storms and flooding – and take much longer to reconstruct following damage (Hay *et al.,* 2003).

3.3.9 Tourism

Tourism is a highly climate-sensitive economic sector (Gössling and Hall, 2006; Becken and Hay, 2007). It is predicted that the effects of climate change and climate-related environmental and societal change will have substantial impacts on tourism destinations. However, the manifestations of climate change are likely to generate differing impacts in different markets and geographic regions. A number of studies by various experts have consistently indicated that developing country tourism destinations in the Caribbean, SIDS, Southeast Asia, and Africa are most at risk (Deutsche Bank Research, 2008; Scott *et al.,* 2008; Gössling and Hall, 2006; Hamilton *et al.,* 2005;). Gössling *et al.,* (2009) argue that climate change particularly threatens the sustainability of many island destinations. According to the Alliance of Small Island States (AOSIS) (2009), Climate Change poses the most serious threat to the survival and viability of island destinations.

Understanding of the consequences of climate change is continually improving, but there still remain considerable gaps in knowledge of how climate change will affect resources that are critical for tourism in SIDS. Despite these knowledge deficits, the UNWTO-UNEP-WMO (2008) identifies that the climate change impacts that are likely to affect tourism regions, their competitiveness and sustainability can be divided into four broad categories: direct climatic impacts, indirect environmental change impacts, impacts of mitigation policies, and indirect societal change impacts. Climate change not only impacts tourist destinations, but also has an effect on tourism demand patterns.

Climate change is likely to change consumer demand patterns and significantly influence eventual impacts on destinations (Gössling, Hall & Scott 2009, p.109). Not only will changes in tourist flows alter the income of destinations' tourism sectors, but will also influence the

choices that will be made by tourism investors (foreign and domestic), governments, and development organisations. This 'snowball effect' is likely to mean that some destinations will benefit greatly from a change in global climate whereas others may suffer greatly; climate change results in differing experiences of various regions around the world and some regions are particularly at risk from seeing a significant drop in demand ('hotspots') such as the Caribbean, Mediterranean, Indian Ocean, Pacific Ocean and Australia and New Zealand (UNWTO-UNEP-WMO, 2008).

A particularly notable point, as indicated throughout this section, is that environmental issues are not just caused by tourism, but also have negative impacts on the tourism sector. According to Neto (2002) SIDS' fragile ecosystems; and their reliance on tourism, means that these environmental issues can be highly damaging as, the success of the [tourism] sector often depends on the quality of their natural environment. In addition, forces outside the control of the tourism industry also result in deterioration of the local atmosphere, coastal ecosystems, and land. Collectively, these issues affect the long-term sustainability of the tourism industry.

3.3.10 Health

Inhabitants of SIDS in tropical locations often suffer acute health problems; their tropical location makes them prone to climate-sensitive diseases, such as injury and mortality as a consequence of extreme weather events common in these areas, and vector-, water- and food-borne diseases (Ebi *et al.,* 2006).

Extreme weather events, such as cyclones and drought, are associated with various effects on human health, such as drowning, and elevated disease transmission and incidence of mental disorders (Hajat *et al.,* 2003). Mimura *et al.,* (2007, p.700) point out that the impacts of extreme weather events are wide-ranging and complex; the WHO (2003) supports this by offering the Caribbean as an example, stating that health risks include insect- and rodent-borne diseases (dengue, leptospirosis, malaria and yellow fever); water-borne diseases (schistosomiasis, cryptosporidium and cholera); food-borne diseases (diarrhoeal diseases, food poisoning, salmonellosis and typhoid); respiratory diseases (asthma, bronchitis and respiratory allergies and infections); and malnutrition from disruptions to the production or distribution of food (WHO, 2003 in Mimura *et al.,* 2007, p.700).

The climate of tropical regions is highly favourable to disease transmission. This is particularly a problem for SIDS due to a number of factors common to these countries, such as deficient practices in public health, inadequate waste management and poor infrastructure (WHO, 2003). Increases in temperature are thought to exacerbate disease transmission; for example, Rawlins *et al.,* (2005) found that in the Caribbean in the warm periods of an ENSO event, the frequency of dengue fever increased; also, Singh *et al.,* (2001) found that a rise in the occurrence of diarrhoeal diseases was positively correlated with increases in temperature in the Pacific. Rising sea level is also likely to contribute to disease transmission, particularly of water-borne diseases, by disrupting sewage and water systems by flooding and inundation, and contaminating freshwater supplies (Nurse and Sem, 2001, p.864). This suggests that expected increases in temperature and changes in water conditions due to GHG-induced climate change will result in greater and more widespread health burdens for SIDS (McMichael, 1993).

3.4 NON-CLIMATE-CHANGE-RELATED ENVIRONMENTAL CHALLENGES TO SIDS

Throughout the preceding discussion on the consequences of the effects of increased GHG emissions on SIDS, the issue of pollution came up as a significant alternative cause of those consequences; this is examined in more detail below.

3.4.1 Pollution and Waste Management

Unique characteristics of SIDS, such as small size, isolated location, high population density and high level of dispersion contribute to the problems of pollution and waste disposal (ESCAP, 2010, p.25).

The main types of pollution are shipping-related pollution, hazardous chemicals and hazardous wastes and solid waste management and disposal (ESCAP, 2010, p.25). Increasing numbers of people present in SIDS due to tourism, and increased importation of packaged consumer goods are adding to the quantities of non-biodegradable waste that needs to be disposed of. In addition, the shift away from organic wastes towards non-biodegradable waste, largely due to rapid urbanisation and the change in industry focus from agriculture to tourism, has contributed to the problem of waste disposal. For instance, the UNEP (2004, p.31) states that many SIDS organic waste has fallen by approximately 50 % over 14 years,

but plastic wastes have risen by about 500 %. Hazardous wastes have also been reported as being imported into SIDS in the past, and are now causing severe problems to public health and contaminating productive land and marine areas; these pollutants include substances such as pesticides, oil, fertilisers and medical wastes (MCEDAP, 2000). These waste products are likely to cost a great deal, not only in their disposal, but also in developing the infrastructure that is likely to be lacking in SIDS. MCEDAP (2000) puts the cost at US$8 million for 14 Pacific SIDS, far beyond the financial capacity of these island states.

MCEDAP (2000a, n.p) divides the consequences of pollution in SIDS into three categories; First are aesthetics, specifically the costs of pollution on the tourist industry. When tourists come across litter both on land and in the sea the aesthetic beauty of SIDS is tainted, reducing the value of the destination (MCEDAP, 2000a, n.p). As tourism is a significant source of income for SIDS, this has severe negative economic implications.

Second are the costs of pollution on human health. Pollution tends to act indirectly on health; for example, mosquitoes carrying diseases often breed in water that has accumulated in litter such as cans, jars and tyres; therefore litter is likely to increase disease transmission rates. In addition, inadequate disposal of solid and liquid waste can contaminate water supplies causing many health hazards. These problems are exacerbated by droughts and floods associated with climate change (see section 3.3.1 and 3.3.6).

Finally are the environmental costs of pollution. A number of these have been discussed throughout section 3.4, but there are some effects that pollution can have that are distinct from those also caused by the effects of climate change. Pollution, by damaging the environment, reduces food and water security, and economic opportunity. Also, chemicals and nutrient products from agriculture enter marine environments through water runoff, dumps, effluents, and wind, causing siltation and oil pollution, and damaging and poisoning marine life (such as fish and coral) partly by disrupting the nutrient-enriched sea surface micro-layer that supports most of the marine organisms in SIDS' marine regions (MCEDAP, 2000a).

A lack of waste disposal facilities is the most common constraint in SIDS faced with waste problems. Most households produce recyclable and organic waste; however, there is often

limited recycling operators and lack of a market for recycled resources. In addition, atoll islands - such as the Maldives and Kiribati – in particular are restricted in waste disposal in the form of landfill sites by their small land area; some SIDS have had to designate an entire island as a landfill. For example the Maldives has a landfill island in the Male' atoll, but lack of adequate management of this site has resulted in a situation that is unsustainable in the long term as the island is already inundated with rubbish. There also tends to be a significant lack of waste treatment facilities, so untreated effluent is often released into surrounding land and water. Waste is also frequently burned, releasing potentially harmful toxins into the atmosphere, or dumped into the sea or mangrove areas.

Pollution and the lack of adequate waste management systems in SIDS is therefore a serious threat to the sustainability and environment of SIDS.

3.4.2 Tourism-related Environmental Issues

The unique geographical limitations that SIDS confront mean that tourism can be more damaging to the environment than similar tourist numbers in larger destinations; as McLaren (2003) describes it, the 'carrying-capacity' of the destination is often reached and exceeded rapidly. The impact of tourism on the environment includes pressure on natural resources (Jules, 2005), pollution and waste generation (Neto, 2002), and damage to ecosystems (Neto, 2002). Alternatives forms of tourism, specifically ecotourism, are being attempted, but evidence suggests that these may still be damaging to the environment.

Attempts have been made to develop alternative forms of tourism that are more 'ecologically sensitive' and which conserve natural and cultural resources (Honey, 1999). One such alternative is ecotourism, which stresses 'low-impact' and 'small-scale' development, limited numbers of tourists, educational aspects to participants, and financial incentives for communities and conservation enterprises (Honey, 1999). Ecotourism has become a popular niche, and can itself be segmented into parts that involve differing interests, such as whale watching, and butterfly and bird observation (Fagance, 1997). For example, islands that provide sanctuary and respite for migratory birds, such as the Seychelles, Majorca and the Orkneys and Shetlands, have shown their link with ornithology (Bull and Weed, 1999; Wilson, 1997). Diaz (2001) suggests that participants of these tourist experiences tend to stay for longer, buy local products, and contribute positively to local

communities; therefore levels of leakage are also reduced. However, a number of authors have been critical of ecotourism's 'ideological' and 'hegemonic' nature (Hill and Gale, 2009; Butcher, 2007; Cater, 2006); furthermore,

> "The rise of sustainable tourism is accompanied on the one hand by a profusion of manuals, project assessments etc. dealing mainly with the 'How's' of ecotourism policy and practice and thereby tending to disregard the concept's specific socio-cultural 'nature" (Kleinod, 2011, p.44).

Therefore it is important to consider the eco-tourism lobby's' financial and political influence as well as considering the 'true' motivations of ecotourists as, according to Wheeler (1993), it has as much to do with sustaining the ego as with sustaining the environment. McLaren (2003, p.28) argues that the so-called benefits of eco-tourism have not always emerged; this is because ecotourism is rarely financially sustainable, and often is not in fact 'eco-friendly' at all - for example, resorts may be recycling while still consuming environmentally harmful products.

Tourism-related environmental impacts occur at all stages of tourist visits and at a global scale, with tourism both contributing to and being impacted by greenhouse gas emissions (Hall, 2010). Tourism in many destinations could be at risk from global environmental problems, in particular 'climate change' and other effects of increased greenhouse gas emissions (IPCC, 2001).

Certain leisure activities that tourists enjoy in can also put pressure on natural resources. For example, jet skiing, boat tours, boat anchors, scuba diving and snorkelling can threaten and damage coral reefs and marine resources (Neto, 2002, p.7). Coral reef and marine resource damage can also dissuade future tourists from travelling to that destination, and so endanger a destination's tourism sector.

Dixon *et al.,* (2001) indicate that, because of the frequently high volume of arrivals, the tourism industry is a key generator of sizeable quantities of solid and liquid waste, and pollution. Both the extent, and the inadequate treatment and disposal of this waste contribute to the contamination of land and freshwater resources – putting them under even greater pressure – and the destruction of ecosystems, such as coral reefs (Jules, 2005, p.10). In addition, tourism is extremely energy-intensive (McLaren, 2003); resort facilities

use up a lot of energy – for heating, air conditioning, lighting and cooking – and a substantial amount of fossil fuel is consumed by tourism-related transportation, particularly in those destinations composed of widely dispersed islands, such as the Maldives. Due to SIDS' small size, their emissions' contribution to atmospheric damage will be negligible, but their high levels of non-renewable fuel consumption and the associated release of polluting emissions, plus pollution generated by tourism, can cause significant local air and water pollution. These, in turn, can discourage tourists from travelling to some destinations, and damage ecologically sensitive areas and ecosystems (Jules, 2005; Neto, 2003).

Tourism activities can disrupt,

> "Fragile vegetation and wildlife and cause irreversible damage to ecosystems, particularly if the infrastructure in those areas is not adequately prepared to absorb mass tourism" (Neto, 2002, p.8).

Not only can tourism interfere with the habitats of wildlife but it can also disrupt their behaviour; for example, Mastny (2001) points out how tour boat operators in the Caribbean Sea feed the sharks to guarantee that they stay in the area, and whale-watching boat crews encourage the petting of dolphins and whales, which changes their feeding patterns and behaviour. Furthermore, Perren *et al.,* (2001) claim that tourism puts pressure on endangered species as a result of increasing hunting and trading activities. In many SIDS, as revealed above, overbuilding, development and leisure activities along coastlines leads to beach destruction, and damage to coral reefs, which are the natural habitats of many species.

3.5 CHAPTER SUMMARY AND CONCLUSION

This chapter has examined the environmental issue of climate change and its consequences by discussing the changes it can bring to the physical environment such as changes in the air temperature, precipitation, ocean heat content, salinity, pH and sea level changes. The discussion highlighted the significant changes these consequences have on the physical environment and these can cause significant damage to the environment of SIDS. Furthermore climate change consequences on SIDS, in terms of what physical areas are likely to be affected, include storm surges and flood risks; beach and coastal areas; coral reefs; mangroves and seagrasses; biodiversity; water resources; agriculture and fisheries;

infrastructure and settlements and tourism and health. Non-climate-related environmental issues faced by SIDS were identified as pollution and waste management and tourism-related environmental issues.

Despite the benefits tourism can bring to SIDS, tourism can also have a variety of negative environmental consequences on the very asset that they depend on - which is the natural ecosystem. These can include pressure on natural resources; pollution and waste generation; damage to ecosystems and high use of fossil fuels; damage of vegetation and biodiversity; beach destruction, and damage to coral reefs. Although tourism can cause damage to the environment it can be managed; however climate change is something, which SIDS have little control over, and SIDS tourism destinations are at risk from climate change. Climate change not only impacts tourist destinations physically, but also has an influence on tourism demand patterns and revenue.

Even though a stakeholder or community may be endowed with certain capacities and have an understanding of the environmental issues, there are various limits and barriers that are likely to result in tasks not being implemented, or being hindered. The next chapter examines the limits and barriers that affect stakeholders' abilities to respond to environmental issues.

CHAPTER 4 - LIMITS AND BARRIERS TO STAKEHOLDERS' RESPONSES TO ENVIRONMENTAL ISSUES

4.1 INTRODUCTION

Various actors at the local and international levels have proposed multiple strategies of coping or dealing with or responding to environmental issues. However, it would be more useful to understand what affects (facilitates or hinders) the ability of actors to respond to these environmental issues. This chapter examines the limits and barriers faced by stakeholders in responding to environmental issues. The chapter also identifies and explains four knowledge gaps that influence the response of stakeholders to environmental issues.

4.2 LIMITS AND BARRIERS

4.2.1 Political Will

The lack of will of policymakers to undertake adaption (Smit & Pilifosova, 2001; Clar *et al.,* 2012) has been attributed to a number of reasons including uncertainty about long-term costs and benefits (Berrang-Ford *et al.,* 2011; Nilsson & Swartling, 2009). The lack of awareness, knowledge and evidence of, and certainty about, issues such as climate change and sea level rise make it difficult for policymakers to reach an agreement and has resulted in disputes over which areas to prioritise. Generally, issues perceived as political priorities crowd out areas that are perceived as less relevant or serious (Storbjörk 2010).

Political will can be affected by the lack of accountability of politicians, power struggles and political clashes between political parties and within the government and a change of government (Dodds, 2007). The lack of political will has resulted in hazard adaptation policy considered 'politically and administratively infeasible' (Clar *et al.,* 2012, p.9) and can result in the formulation of policies that are not implemented adequately - namely, 'symbolic policies' (Newig, 2007). The monitoring and evaluation of policy requires experience due to the complex nature of impacts and outcomes. Therefore the lack of political will or commitment results in a disinterest in the evaluation of policies although these can also be hindered by resource issues (Clar *et al.,* 2012, p.10).

The lack of political commitment can also be due to a lack of adequate leadership (Moser & Ekstrom, 2010). It has been identified that leaders may pose barriers in two ways: when they are not part of, or present in, the process or when they limit, hinder or stop the process. Committed leaders ideally facilitate, support and guide the adaptation process

when the process being undertaken is unfamiliar or new active leadership is important and thus leaders can help maintain momentum of the adaptation process (Ekstrom *et al.,* 2011, p.49) Moser (2009) argues that policies are ineffective if policymakers do not have the motivation, the authority, or the skills to lead adaptation.

4.2.2 Institutional

Responsibilities among stakeholders are inadequate or unclear as a result of the way institutions are set up and how roles and responsibilities are defined and allocated (Clar *et al.,* 2012). This can be true at different levels in a community; for example the local community may not take action or initiative regarding environmental issues because they are waiting for central government to take responsibility (Amundsen *et al.,* 2010), but it could also be due to resource issues. Dealing with and developing strategies to tackle environmental issues is complex and requires both vertical and horizontal government interaction and communication, as when roles and responsibilities are inadequate and unclear, action is hindered. When responsibilities are known and clear, action could nonetheless be negatively affected by those responsible, who lack the will or experience difficulties in getting the cooperation of other actors (Adger *et al.,* 2005; Storbjörk, 2010). Issues related to the environment may not be even brought into decision making or policy formulation due to the way institutions operate, communicate and are organised.

4.2.3 Regulatory

Laws and regulations may hinder action due to limitations resulting from planning laws; thereby increasing time, resources and costs involved in the implementation of policy. For example DCEE (2011, p.ii) mentions that regulatory barriers occur where regulations such as Building Codes do not take climate change into account, or where standards or codes reduce resilience to climate impacts. Policy and government intervention may not always be

the best option to lead to effective adaptation. Type of intervention requires consideration, including examination of risks and costs of action versus inaction. Laws and regulation cannot act as barriers alone but operate with a number of others such as the ones discussed above.

The policy and regulatory environment in which the private sector operates influences decision making significantly. Regulation can compel companies to take adaptation into account. Regulations that have been implemented for other reasons such as building standards, water temperatures limits, water quality standards, price ceilings and security regulations will influence adaptation choices of the private sector. However, consistency and predictability of regulation should be present if it is to encourage adaptation (Agrawala *et al.,* 2011, p. 43).

4.2.4 Physical Environment

Human action and climate change can potentially damage the natural environment by leading to the depletion of available natural resources. This can result in the increased vulnerability of communities dependent on their environment. Human action can be managed through controlling the use and the way it is used whereas climate change is less predictable and more variable, and it is therefore more difficult to manage the consequences (Berkes & Jolly, 2001).

Climate Change can damage the ecology, result in the loss of species, and reduce the ability of eco-systems to cope and regulate themselves. SIDS' ability to adapt to climate change will depend on the rate and magnitude of climate change. If Climate change affects the natural functioning of an eco-system, natural adaptation could become inhibited. This may lead to a limited set of response options left for SIDS and eventual migration out of their national territories in a worst case scenario (Barnett & Adger, 2003; Barnett, 2005).

4.2.5 Human Resources

SIDS tend to have small populations; therefore finding enough employees can be difficult. Moreover finding staff with the right technical qualifications and abilities is another barrier, to effective environmental management. As mentioned earlier, political disinterest and lack of financial resources may affect the ability of policymakers to measure the impact and outcomes of policy, but policy could also be affected by the lack of technically qualified employees (Burch, 2010; Jones, 2010). The lack of training, education and human resource investment hindered the development of human resources to meet the technical needs of adaptation which was required. For example, Robinson and Gore (2005, pp.113-114) found

that staff in Canadian municipalities often felt that there was a lack of training to deal with climate change and inadequate staff numbers to deal with the workload.

4.2.6 Technology

Uncertainty about environmental issues contributes to the limiting of responses; similarly, uncertainty, and lack of knowledge about the feasibility, long-term costs and benefits implications of technology result as a barrier (Tol *et al.,* 2006; Mailla *et al.,* 2005,). Technology may not be equally transferrable to all stakeholders, situations and environments - therefore strategies of adaptation may be beneficial in one context, but ineffectual, or cause and/or exacerbate vulnerabilities in other contexts (Adger *et al.,* 2007).

Implementing technology responses can sometimes be affected by cost issues and cultural issues (Adger *et al.,* 2007; Mailla *et al.,* 2005). For example, coastal protection by using extensive coastal engineering is generally not an option for governments due to the high costs involved (Ikeme, 2003). In the Caribbean, physical adaptation or 'purely technical' adaptation is being implemented across the region; however, due to the high costs of projects, particularly coastal protection, this type of protection is not as widespread as others (ECLAC, 2011). Moreover, innovation can also come in the form of ideas such as 'land use planning adaptation strategies'. This has been used in the Caribbean where, for example, coastal zoning in Jamaica has been implemented to counter the anticipated impacts of sea level rise. Zoning has reduced the risk associated with coastal development as well as reduced the vulnerability of non-zoned areas by supporting ecosystem services such as beach replenishment (ECLAC, 2011, p.25).

4.2.7 Financial

Even though adaptation actions may be planned and agreed upon, when it comes to implementation, limited budgets put a brake on these coming to fruition (Aaheim & Aasen, 2008). Moser and Ekstrom (2010) argue that having budgets to develop 'science' is all well and good; however there needs to be sufficient budgeting for implementation and monitoring of actions. Financial barriers to responses to environmental issues can be experienced at government, private sector and at the local community levels. World economic shocks and crisis can affect SIDS particularly those reliant on industries such as tourism which is susceptible to the condition of other economies. However, tourism can

also bring in foreign currency and significant revenues which can be utilised in a number of ways, but this will depend on what the state policies are on taxes, budgets and public spending and how these are implemented.

According to Adger *et al.,* (2009), competition for resources exists in different ways such as among sectors and regions and between policy priorities. At the government level, according to Leary and Kulkarni (2007, p.39), government agencies often lack the resources in relation to the demands imposed on them and therefore limit responses and action. The burden of major infrastructure projects is often left to the government to finance because the private sector is often unwilling to invest because the benefits of doing so are outside the scope and timeframe of investment decisions (DCEE, 2011, p.ii). However, Epstein and Mill (2005) suggest that the economic costs of adaptation are spread across stakeholders groups such as the government and the private sector, and at the local level.

Nevertheless, the private sector is often cautious about investing in adaptation due to uncertainty regarding impacts, costs and benefits. Agrawala *et al.,* (2011, p.43) suggest that uncertainties around climate impacts could stifle investments in adaptation. Investment decisions are often based on a cost/benefit analysis; the private sector may be unwilling to commit to significant upfront investments given uncertainties around the extent of the end benefits, particularly when climate change impacts are often expected to occur in the longer term. Therefore, although the private sector may have the finances to invest, if it does not make business sense to do so in terms of cost recovery or asset protection, they may be unwilling. Argawala *et al.,* (2011, p.43) mention two ways that may result in the private sector investing in adaptation. The first is 'incentives': these could be financial such as subsidies, tax relief or reduced import tariffs which would bring some sort of financial benefit for the company. The second way is if the private sector has reduced 'operational flexibility'; in this case, a company will be more likely to implement large-scale adaption measures if it lacks choices about the adaptation options available to them; and where companies may not able to adapt easily by switching locations or by implementing 'soft' (minimal impact on environment) engineering measures, they will be inclined to implement 'hard' (significant impact on environment) engineering solutions.

The local and individual levels are often viewed as financially limited in the way they can respond to environmental issues (Dulal *et al.,* 2010; Yanda *et al.,* 2006; Smit and Skinner, 2002). Poverty is seen to affect the ability of local communities to respond to environmental issues. This situation therefore requires stakeholders such as the NGOs, private sector and government to help in the promotion and tackling of the issues they face. The lack of financial resources also means that local communities often lack insurance as a way to reduce vulnerability (Adger *et al.,* 2007; Wehbe *et al.,* 2006). Stakeholders are unwilling to take out insurance for a number of reasons including low-probability of occurrence, and the costs of administration and insurance premiums due to uncertainty (Kunreuther *et al.,* 2001; Mills, 2005).

4.2.8 Information and Cognitive

Ekstrom *et al.,* (2011, p.50) suggest that information-related barriers are attributed to how information is created (goals, perceived needs, by what discipline and on the basis of what paradigm) and how it is communicated (by whom and in what way – one-way information transfer or two-way dialogue). Furthermore, adaptation planning should employ both hazards and vulnerability approaches to create the most comprehensive understanding of the threats to a particular context, by understanding vulnerabilities and risks from climate variability and other non-climate stressors. The DCEE (2011) mentions consistent and accessible information and the capacity to apply it are essential requisites for effective adaptation. Inconsistent or inadequate access to information can result in inaccurate insurance premiums and real estate values which poorly reflect climate risks such as sea level rise.

Moreover, cognitive barriers can be attributed to psychological factors that influence an actor's ability to act on information about climate change. Perception of risk affects how urgent the need for adaptation is; for example, the longevity and uncertainty about climate change impacts creates difficulties in understanding the problem or developing a solution. However, even if risks posed by climate change and options to adapt are understood, this does not necessarily mean that adaptation will occur, as there need to be incentives for self-preparedness (DCEE, 2011, p.ii). Cultural cognition not only has direct impacts on the process, but also indirect impacts, such as what information is valued and is therefore

produced. Furthermore, people can place values on constraints such as budget and intellectual capacity (Ekstrom *et al.,* 2011, p.52).

Nurse and Sem (2001, p.867) suggest that one of the main barriers to adaptation implementation in SIDS comes from uncertainties related to predictions of future climate change, whereby 'uncertainties' means that adaptation strategies are merely forms of risk management to mitigate disasters (Bruce, 1999). Lack of evidence or certainty of climate scenarios (Clar, *et al.,* 2012) has restricted climate change responses from policy-makers. The uncertainties regarding climate change (adaptation) that concern policy-makers have been attributed to scientific or methodological problems in predicting future developments and impacts (Aaheim and Aasen, 2008; Füssel, 2007). Mimura *et al.,* (2007) identify that in many SIDS there is a significant lack of baseline information about the interaction between climate and human systems; this inhibits the development of likely trajectories of climate change impacts and vulnerability. However, Adger *et al.,* (2007, p.735) claim that even if the knowledge of the causes, impacts and potential solutions of climate change exists, adaptation will not necessarily occur. According to Niemeyer *et al.,* (2005), individual responses to the consequences of climate change vary depending on what they perceive and prioritise as carrying the most risk. Furthermore, even if scientific evidence is relatively certain, the lack of interaction between science and policy making can prevent it from being acted upon in the political sphere (Clar *et al.,* 2012).

4.2.9 Social and Network

According to Adger (2003) adaptation is a social process that requires collective action and social capital. Ideally it should provide opportunities for communities to interact with other stakeholders such as government, the private sector, international organisations and NGOs. Stakeholders could potentially help those in society that are most vulnerable from environmental issues. However, it clear is clear from earlier discussions above that stakeholders are likely to have differing perceptions, values, understandings, priorities and preferences in terms of what the environmental issues are and how to respond to them. Therefore, multiple and contrasting views on environmental issues is likely to result in the implementation of those issues which the stakeholders who hold power and access to the necessary resources prioritise such as the government and the private sector. This can cause

a conflict of interests. Furthermore, responses to environmental issues may not be made in the most equitable way since it is the values and preferences of certain stakeholders being implemented (Smit *et al.,* 2001). According to Ford and Smit (2004), differences in the values on climate change issues among stakeholders could result in variances in motivation to implement strategies.

Insufficient knowledge-sharing and a lack of networking between experienced stakeholders, science and policymakers (Clar *et al.,* 2012) have affected the opportunities to reduce uncertainty about climate change issues. The different rationalities and languages in science and policy-making have not helped during the interaction process (Hinkel, 2011). Networks are required to link sectors and stakeholders due to the complexity and quantity of knowledge and experiences (Leary and Kulkarni, 2007). Moser (2009) and Storbjörk (2010) identified that policy-makers often do not benefit from the experiences of other stakeholders, and they rarely share their own experiences. Furthermore, Leary and Kulkarni (2007, p.45) argue that it is lack of determination among stakeholders that impedes adaptation due to reasons such as low awareness, insufficient knowledge, and other priorities competing for resources. Knowledge creation should be relevant to the context and choices, as well as comprehensible and credible to all stakeholders (Leary and Kulkarni, 2007, p.46).

Responses to environmental issues can have certain social implications, particularly for the stakeholder group that is being affected. For example, migration of local communities resulting in resettlement and relocation is often considered as highly effective but also can often result in social and cultural problems. Such problems are that local communities feel that they have lost their territory and heritage and social problems with host communities, among others.

Following the discussion regarding the limits and barriers affecting stakeholders' responses to environmental issues, adaptation was viewed as a common and ideal response to climate change for SIDS; however, it may not occur or be implemented fully for a number of reasons. There may be conditions or factors that result in adaptation being ineffective as a response to climate change. The perceptions of the conditions can be subjective and dependent on each stakeholder's or group of stakeholders' values. The barriers to adaptive

action affect the efficacy and acceptability of adaptation responses to climate change effects (Adger, 2007, p.732). Mimura *et al.,* (2007, p.706) note that a predominant constraint that small island states face is a lack of internal adaptive capacity. SIDS' capacities to respond effectively to environmental threats are limited by their low adaptive capacity.

Clar *et al.,* (2012) identified 33 guidelines for adaptation to climate change; most of these explicitly acknowledge the need to address barriers (often also referred to as challenges, obstacles, constraints or limitations). Although guidelines tend to aim to provide support for policymakers in developing and implementing adaptation policies, some of them also target NGOs and businesses. From the 33 documents examined, one third of the guidelines explicitly address more than one level of decision making (e.g. national and regional or regional and local levels); eight focused on the local level, four on the regional level and three on the national level. Seven guidelines did not give a specific level of decision making. Seven of the 33 guidelines address the issue of adaptation in developing countries while 26 focus on adaptation in OECD countries (Clar *et al.,* 2011, pp.11-12).

Clar *et al.,* (2012, p.12) recognise that although guidelines can be useful, there are certain limitations; for instance they can only be seen as "ideal world scenarios" or as "maximum approaches" with little likelihood of being put into practice in the real world. Another limitation mentioned is when guidelines reflect mainly the (subjective) experiences of their authors but fail to take into account the research on barriers in adaptation policy-making. From their research, Clar *et al.,* (2012, pp.13-14) mention three barriers that came up the most; these were lack of evidence or certainty, lack of resources, and unclear responsibilities within and between levels of government. They also mention two 'not explicitly addressed barriers'; these are that policy is politically/administrative infeasible; and lack of experience with monitoring and evaluation practices. Moreover they mention that 16 of the 33 guidelines give general recommendations without addressing particular barriers.

Importantly, Clar *et al.,* (2012, p.14) note that only one of the 12 guidelines they analysed in detail explicitly emphasises that political commitment from senior policymakers is vital for successful adaptation processes. However, three guidelines provide general suggestions on how to overcome this barrier such as identifying the reasons for a lack of commitment   by

involving key decision makers from the start. As mentioned earlier, the barrier - 'unclear responsibilities within and between levels of government' - did not generate a single recommendation on how to resolve the barrier.

Clar *et al.,* (2012, p. 16) acknowledge that most guidelines do not even address the evidence-base they build upon, whether it is research, expert suggestions or subjective experiences. Moreover, most guidelines did not provide background information on why certain barriers have been addressed and others not. They recognised that barriers which are "highly context-specific and/or difficult to overcome" are often addressed with general suggestions that may not offer much help for policymakers.

4.3 KNOWLEDGE GAPS IN THE FACTORS THAT INFLUENCE THE RESPONSE OF STAKEHOLDERS TO ENVIRONMENTAL ISSUES

From the analysis of the literature related to limits and barriers that affect stakeholders' abilities to respond to environmental issues, four gaps have been identified. First, there has been a lack of consideration of all relevant stakeholder groups (stakeholders from government, international organisations, private sector, third/voluntary and the local community) within a single study, regarding their capacity to respond to environmental issues. Second, there has been a lack of research into how the interaction of all relevant stakeholders in a given context affects each stakeholder's individual capacity to respond to environmental issues, and how this influences the overall response. Third, although multiple causes have been put forward to explain the inadequacy of certain stakeholders' responses to environmental issues in terms of limits and barriers, there is a distinct lack of clarity around how these various limits and barriers may interact, and so it is not possible to determine whether or not there are any root causes to stakeholders' capacity to respond to environmental issues, thus the overall response. This means it is difficult to offer potential solutions that will enable stakeholders and states as a whole to adequately deal with environmental issues. Fourth and finally, there is a noticeable lack of research into all of the above issues with regards to SIDS. This deficit particularly needs addressing given the environmental challenges that currently face SIDS.

4.4 CHAPTER SUMMARY AND CONCLUSION

From the literature, nine limits and barriers to stakeholders' responses to environmental issues were identified. The literature showed that the response strategy of adaptation was viewed as a common and ideal response to climate change for SIDS; however it may not occur or be implemented fully for a number of reasons. There may be conditions or factors that result in adaptation being ineffective as a response to climate change (as mentioned above). Limits and barriers in the literature were often portrayed as 'ideal world scenarios' or as 'maximum approaches' with little likelihood of being put into practice in the real world and barriers which are 'highly context-specific and/or difficult to overcome' are often addressed with general suggestions that may not offer much help for policymakers. The research identified four specific gaps in the knowledge when examining stakeholders' responses to environmental issues which aided the development of the research aim and objectives as explained in chapter 1.

CHAPTER 5 – RESEARCH STRATEGY AND DESIGN

5.1 INTRODUCTION

This chapter first, explains the research strategy, including the ontology, epistemology, and theoretical stance, after this, it explains the methodology by discussing the role of qualitative research and the case study approach. Second, the research design and methods of enquiry section of this chapter begins by considering issues of reliability and validity, and the measures that this study used to enhance these factors. Then, following the example set by the ProVention Consortium (2007) – who developed the 'seven-step' model – an adapted eight-step model is generated by the author that details the different steps that were involved in conducting this research, and the activities in each of these steps (please see section 5.3.2 for the steps).

5.2 Research Strategy

When undertaking research into the human dimensions of society, it is important to consider the research paradigms and matters of ontology (what is reality?), epistemology (how do you know something?) and methodology (how do you go about finding out?) that characterise these paradigms, and create a holistic view of how knowledge is viewed. Although everyone has inherent preferences that may mould research designs, these are considered as part of a sequence of choices that the researcher must deliberate that need to link back to the original research problem; otherwise, methods that conflict with the researcher's viewpoint may be adopted, resulting in the value of the final product being weakened through lack of coherence (Blaikie, 2000). With this in mind, it is important to describe the approach that has been undertaken in this study before discussing the full research design.

Subjectivism and objectivism are often considered as,

> "Polar opposites with varying philosophical positions aligned between them" (Holden and Lynch, 2004, p.4).

In subjectivism, it is assumed that people ascribe subjective meanings to objects in the world, whereas in objectivism, people are assumed to discover meanings already inherent in the object.

Traditionally, social science researchers employed objectivist methods developed from the natural sciences. Thus society was seen to be rule-governed, with 'one' true reality (Phillimore and Goodson, 2004).

Subjectivism developed as a critique of traditional objectivist approaches to researching. Crotty (2009) argues that the everyday science that objectivism portrays is not the everyday world we experience because science is rigid, enforces strict boundaries on the observed world, is highly systematic and organised, and has elements of absoluteness about it. But we live in a world that is unpredictable, changing and ambiguous. Subjective thought is considered to be critically aware, action-oriented and reflexive (Denzin and Lincoln, 1994, p.11), and, based on stakeholders' thinking, they identify or culturally invent societies and places (Jamal and Hollingshead, 2001, pp.63-65). Therefore, the subjective approach would be highly beneficial to social science research, making it stronger and more defensible. However, research in social sciences often fails to achieve this (Hollingshead, 2004a; Meethan, 2001; Lidchi, 1997; Hall, 1994). This suggests that there is a clear need for critical subjectivist approaches; therefore, a subjective stance is adopted in this present research in an attempt to address this deficit. Based on a subjectivist stance, it is assumed that the choice of research objectives and the study aims reflect one's own view of the world, and so the way we observe, report and undertake our research will be affected by it. One's assumptions need to be made clear. Within the subjectivist approach lie ontological and epistemological assumptions.

The definition of ontology has been stated as "the science or study of being" and includes,

> "Claims about what it looks like, what units make it up and how these units interact with each other" (Blaikie, 1993, p.6).

A particular ontology is essentially a description of a researcher's view on the nature of reality; specifically whether the reality is created in our minds so it, "exists only through experience of it (subjectivism)", or whether it "exists independently of those who live it (objectivism)" (Flowers, 2009, p.1). The researcher's ontological view is the fundamental base to all other assumptions – what is assumed in terms of the view of reality grounds the researcher's other assumptions.

The subjectivist-objectivist dichotomy is misleading; there are several taxonomies that lie between these extremes that collectively form a continuum. As mentioned above, it is the view of this researcher that reality exists only through the experience of it, i.e. at the subjective end of the continuum, but the ontological view adopted here spans two taxonomies: 'reality is a projection of human imagination'; 'reality is a social construction' (Holden and Lynch, 2004, p.6). In relation to environmental issues in the Maldives, the assumption is therefore that stakeholders' perceptions, beliefs and values determine the environmental phenomenon that they respond to, the particular response chosen, and the relative urgency attached to responses. Also, over time, stakeholders interact with each other, constructing concepts or mental representations of the interpretations and activities of others in relation to environmental challenges, and these become habituated into reciprocal roles played by stakeholders relative to each other, determining different groups' responses to environmental problems. In addition, by taking a subjective stance, the assumption is that challenges and limitations that stakeholders face to taking action in response to environmental issues depend on human imagination and socially constructed reality.

As pointed out by Hollingshead (2004b, pp.85-86), subjectivist ontological stances are influenced by a number of issues, which include factors such as values, contextualities, the identities held relating to a place, intensity of these held identities, critical reality and the nature of knowledge; these issues are considered below in relation to the research objectives of this study.

When contemplating the various views in existence in relation to what constitutes reality, it is also important to consider how that reality is measured, and what constitutes knowledge of that reality, which leads to epistemology (Flowers, 2009, p.2).

Epistemology deliberates understandings about the most appropriate ways of investigating the nature of the world (Flowers, 2009, p.2) in addition to, as Eriksson and Kovalainen (2008, p.14) question what knowledge is and what are the sources and limits of it. Blaikie (1993, p.8) claims that it is the science of the method of knowledge, and Chia (2002, p.2) claims that it is about how you know and what it is possible to know, and argues that it

satisfies the need to consider the methods and standards through which reliable, verifiable knowledge is produced.

There is considered to be an interdependent link between epistemology and ontology, with each informing and depending on the other; if the researcher holds particular ontological viewpoints, these may impact the epistemological conclusions that are derived. As a subjectivist perspective is adopted in this study, and based on the ontological assumptions held by this researcher, the relevant epistemological stance is that knowledge about reality cannot be discovered, acquired from or imposed from outside, and observing behaviour cannot help people understand it; knowledge is subjectively attained, personally experienced, and socially created and distributed. This anti-positivist stance assumes that knowledge about reality is determined by the experience acquired out of one's direct interaction with a phenomenon, during which stakeholders interpret the phenomenon and attach meanings to different actions and/or ideas, so constructing new knowledge.

In addition, the anti-positivist position adopted here assumes that knowledge is created through everyday interactions that disseminate knowledge and invoke taken-for-granted rules, which are interpreted in interactive settings that make knowledge meaningful. Interactions do not equally generate knowledge; the dissemination of knowledge and the development of agendas are influenced by unseen power in knowledge production and legitimation (Hollingshead, 2004b). According to Aitchison (1996), the interaction mechanisms by which knowledge is disseminated (such as through research and consultancy publications, professional associations, educational management and teaching) have an influence on the construction of knowledge and the way that it is taught, as well as the communication, legitimation and reproduction of knowledge within stakeholder groups. Certain interest groups may become more dominant in the field, due to the way they repress some forms of knowledge and ideas and promote their own.

The epistemological implications of the above discussion to the study is to seek knowledge about what affects stakeholders' ability to respond to environmental issues in the Maldives was acquired through obtaining 'phenomenological insight, revelation' and through understanding 'how social reality is created'.

The epistemological view that knowledge is socially constructed has been labelled by some researchers as 'constructionism', which is described as,

> "The view that all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context" (Crotty, 2009, p.42).

This stance sees meaning and truth as not strictly subjective or objective, but lying between the two poles. According to Fish (1990, p.186), meanings for objects are created 'institutions'; therefore society becomes embedded in, inhabits, and has access to the public and the conventional senses they make. Known as 'a publicly available system of intelligibility,' these institutions become sources for the interpretive strategies through which meanings are constructed.

This constructionism view is useful when contemplating the theoretical perspective that is most appropriate for this study. Ontological, and its linked epistemological, positions form the 'research paradigm' or theoretical perspective (Blaikie, 2000), which is a set of beliefs that guides action, and it essentially classifies different research approaches.

As this study adopts a subjectivist/constructionist approach, an interpretivist paradigm is most suitable. The interpretivist (sometimes referred to as constructivist) paradigm argues that in the social world, stakeholders – individuals and groups – make sense of situations according to their own experience, memories and expectations (Flowers, 2009, p.3). Therefore, meaning is constructed and reconstructed through experience, which results in numerous differing interpretations that create a social reality in which people act.

The interpretivist approach to human inquiry has occurred in a number of forms. The one subscribed to in this study is 'phenomenology'. Phenomenology seeks to understand and describe a phenomenon the same way it appears in an individual's consciousness. Crucially, it seeks to identify the interrelationship between 'life and world', and to understand how phenomena interact with the way people live (Phillipson, 1972, pp.120-123). This perspective presumes that "humans direct their consciousness toward objects" (Davis, 1995, p.121), which fits the notion of intentionality.

Unlike constructionism, however, phenomenology sees the stakeholder as engaging with objects and making sense of them directly, without the meaning of objects being pre-empted by that stakeholder's cultural heritage (Davis, 1995, p.122). Furthermore, phenomenology views culture as potentially enabling and liberating, but also potentially limiting and crippling, and a specific set of meanings imposed by culture has come into existence to serve particular interests, resulting in its own forms of oppression, manipulation and other injustice (Crotty, 2009, p.71). This view is in agreement with this researcher's own stance on the subject. In research, this requires the researcher to call into question the meanings that they attribute to phenomena, and in this sense,

"It is a reflective enterprise, and in its reflection it is critical" (Larrabee, 1990, p.201).

Crotty (2009, pp.82-83) points to two clear features of phenomenology. First, there is some objectivity about it in that it seeks objects of experience instead of being happy with just a description of the experiencing stakeholder. This is particularly noteworthy for this study, as environmental issues can be considered as distinct from those experiencing them, even though the meanings that are attached to them will depend on the stakeholder's own experiences, values, beliefs and context. Second, it is predominantly about critique, and it questions what is taken for granted. Under this paradigm, it is seen as important to discover and comprehend the meanings and contextual factors that influence, determine and affect different stakeholders' interpretations. Thus, as Saunders *et al.,* (2007) point out, the focus of researchers that adhere to this paradigm is on comprehending the worldview, meanings and interpretations of stakeholders, which are contextual and so not broadly generalisable. In this study, this demanded the disregarding of personal viewpoints about environmental issues in favour of collecting and analysing data in ways that identify, understand, describe and maintain the subjective nature of stakeholder responses. This feature of phenomenology is highly subjective, so this paradigm is associated with qualitative methods to data collection (Eriksson and Kovalainen, 2008). The data-gathering method most suited to this study was semi-structured, or unstructured, interviews (Crotty, 2009, p.83).

5.2.1 Methodology

This section discusses the methodology that was followed by the research by explaining the role of qualitative research and why the case study approach was chosen.

The study employed qualitative research because qualitative methods help increase the understanding of the human dimensions of society, which includes social and cultural implications (Phillimore and Goodson, 2004), and was the most appropriate methodology for the subjectivist stance adopted in this study. The emphasis of qualitative research is on studying things in their natural settings. In the case of this research study – analysis of what affects stakeholders' responses to environmental issues in the Maldives – qualitative research will help increase our social understandings of responses, because it examines meanings that people bring to the phenomenon, as well as humanising problems and bringing out an insider's perspective.

Qualitative research is not a specific set of methods, but a methodology. Phillimore and Goodson (2004) mention a hybridisation of research approaches that has become increasingly common, which indicates the interdisciplinary nature of many research topics. One of the advantages of social science research is that it is not inhibited by fixed disciplinary boundaries with their associated methods and so it is possible to have a combination of approaches and use a number of research paradigms to enable fluidity in the research (Phillimore and Goodson, 2004, p.20).

Increasingly, qualitative research has become perceived as a process, rather than an activity. According to Bryman (2001, p.264), a number of textbooks now refer to qualitative research as a strategy rather than a set of methods. As a process, qualitative research can produce theory from the research, with an emphasis on understanding the world through the perspectives of the research participants, and thus social life should be viewed as the result of processes of interaction and interpretation (Phillimore and Goodson, 2004, p.4). However, when perceiving qualitative research as a process, it is important not to neglect the appropriateness of the method as qualitative research activities are actually strengthened and made more valid by discussing options first, and then choosing an appropriate and relevant methodology before going into the field.

Whilst qualitative research has been identified as the most appropriate methodological approach to employ when investigating the human dimensions of problems, such as the reasons for constraints and barriers in responding to environmental issues in the Maldives, there are concerns that must be addressed in order to ensure that the research generates reliable and valid conclusions. For example, it is important not to represent the participants' voices in a single unified point of view. Phillimore and Goodson (2004) state that often the 'authentic voice' of the participants being researched is lacking and the research findings are written from an 'objective' perspective in a story format.; interpreted accounts such as these are frequently portrayed as generalisable facts, and findings are often presented as a single truth (Ladkin, 2002; Preston-Whyte, 2002), which is in danger of reinforcing the sense of superiority of the researcher's dominant culture and strengthening, instead of breaking down, present stereotypes (Wearing and Wearing, 2001). By showing multiple voices of the participants in relation to their own culture, a more valid set of data is generated. The aim of the researcher is to bear in mind subjectivity in terms of the respondents' ethics, values and politics, and use a number of interconnected interpretive methods to maximise understanding of the research problem (Phillimore and Goodson, 2004, p.34).

The particular form of qualitative research selected for this study is a 'single-embedded case study' approach. A case study approach enables the researcher to explore the particularity and complexity of a single case, by reaching an understanding of its activity within important circumstances (Stake, 1994, p.xi). It has the propensity to capture the complexity of a single case that has special interest (Stake, 1994). Within this study, the distinctiveness of the case is that it focuses on stakeholders in the Maldives; a low-lying tourism-dependent SIDS, which has been recognised by the UN as a unique category (UN Division For Sustainable Development, 2009; see also chapter 2).

According to Yin (2009, pp.19-20), case studies have a distinct place in evaluation research, with a minimum of four different applications: (1) they can be used to explain causal links in real-life interventions that are too complex in nature for surveys and experiments, (2) they can describe an intervention and the real-life context in which it happened, (3) they can illustrate a number of topics within an evaluation in a descriptive way, and (4) they may be used to enlighten a situation where there are no clear outcomes as a result of an intervention.

Often, the case study researcher may find many more variables of interest than data points; as such the investigator will be required to use multiple sources of evidence and, therefore, the case study approach's unique strength, which lies in its ability to deal with a broad range of evidence, including documents, artefacts, interviews and observations, is particularly well suited to these complex situations (Yin, 2009, p.11).

According to Yin (2009, p.2), case studies are a preferred method when 'how' and 'why' questions are being posed, when the investigator has little control over events, and the focus is on a contemporary phenomenon within a real-life context. The characteristics of this research investigation show some similarities to these points. Firstly, the research aim – identify what affects stakeholders' ability to respond to environmental issues in the Maldives – seeks to uncover 'how' stakeholders differ in terms of what they are saying is affecting their responses to environmental issues, and 'why' they think it is affecting their response. Secondly, the investigator has little control over the events being investigated in this study as it involves nation-wide (if not broader) issues that are not determined by a single individual, and the study involves looking into what stakeholders are already saying and doing about these environmental issues. Finally, although environmental issues have been in existence for a long time, the concern over their impacts is relatively contemporary, as are the strategies that stakeholders are using to address them.

Within the single case, subunits of analyses can be incorporated so that a more complex or 'embedded' design is developed where the subunits offer the chance for extensive analysis; thereby the insights into the single case are enhanced. The advantage of a case study with embedded units (institutional/policy documents, and a broad array of stakeholders from the public sector, private sector and the third/voluntary sector) is that it avoids the pitfalls of conducting research at an abstract level. It allows the researcher to examine specific phenomenon in operational detail (Yin, 2009). Yin (2009, p.53), however, does warn that if too much attention is paid to the subunits, the larger aspects of the case may be ignored, and the case study may shift its orientation and nature; this shift may be justifiable, but if it is it will have to be addressed in detail and linked back to the original enquiry.

Although criticisms exist concerning the case study approach – such as that they do not produce generalisable findings – given the interpretive stance adopted in this study and the

nature of the research aim, the case study approach was considered the best option as it provides a systematic way to collect and analyse data and report the results, and therefore understand the problem in greater depth. In particular, it provides a variety of participant perspectives, and uses multiple techniques of data collection. In addition, as Yin (2009) states, case studies are particularly well suited to situations in which it is difficult to separate a phenomenon's variables from the context; which is highly characteristic of environmental issues in the Maldives.

5.3 RESEARCH DESIGN AND METHODS OF ENQUIRY

A research design is the logic that links the data to be collected and the conclusions that will be drawn to the aims that the study seeks to address. Every type of empirical research has an implicit research design; even the most basic forms have a logical sequence that connects the empirical data to the initial research questions. However, within the context of a case study research design, Yin (2009, p.25) claims, this is a difficult process as a comprehensive catalogue of research designs for case studies has yet to be developed; there are no textbooks similar to those found in the biological and psychological sciences, which cover design considerations for case study research (Sidowski, 1966; Cochran and Cox, 1957). Therefore, in-depth consideration must be given to the design that is most appropriate to the given context of a case study research.

A research design can be seen as a 'blueprint' to deal with at least four problems: what questions to study, what data are relevant, what data to collect, and how to analyse the results (Philliber *et al.,* 1980). The research design is more than a mere work plan - its main purpose is to avoid not fulfilling the research aims and objectives with the evidence, thus it deals with a *logical* problem rather than a *logistical* one (Yin, 2009). Significant barriers to achieving the research aims of a study occur by not factoring in measures to ensure reliability and validity; without these, there is likely to be doubt in the accuracy and justifiability of the study's findings and conclusions, and so the study will not be valued very highly.

5.3.1 Validity and Reliability

The issue of the reliability and validity, according to Bryman (2008, p.55), depends on the extent to which the researcher feels these are appropriate for the evaluation of case study research. Writers such as Yin (2003) have shown that they are appropriate. Yin (2009, p.41) provides a table that illustrates case study tactics used to cope with four research issues. These are *construct validity*, referring to the extent to which a study investigates what it claims to investigate, and applies mainly during data collection; *internal validity*, which exists when the researcher is able to construct a plausible causal argument that defends the conclusions of the research, and is relevant to both the data collection and data analysis phase; *external validity*, or *generalisability*, which exists when empirical findings can be generalised to theory that account for phenomena within and outside the context in which the study took place; and *reliability*, which relates to the absence of random error, meaning that researchers, following the current research, will be able to replicate the study and achieve the same insights (Gibbert and Ruigrok, 2010, pp.715-718).

Bryman (2008, p.55) suggests that case study researchers, whose point of orientation lies mainly with a qualitative strategy, tend to ignore the salience of these reliability and validity factors, but those researchers who have been strongly influenced by quantitative research strategy tend to show these issues as more important. He offers the example of Stake (1995), who has written extensively about case studies, as barely mentioning the issues of reliability and validity.

The study addresses both validity and reliability in its research. Construct validity is achieved through the collection of data from a variety of different sources, the establishment of a chain of evidence, and having transcripts and drafts reviewed. Internal validity is achieved through triangulation of data from three sources - literature, policy documents and interview responses - and by examining whether the main themes from the research matched with themes found in previous studies. External validity is achieved through the provision of a clear rationale for the selection of the case study method, the selection of the Maldives and environmental challenges that it faces as the case study, and substantial information on the context of the case study, and reliability is achieved through the creation of a case study database, the production of a case study protocol, and presenting data using

minimal inferences. These measures to ensure reliability and validity are integrated into the research design, which is discussed in the following section that details the specific research design employed in this study. The seven-step framework, created by the ProVention Consortium (PVC, 2007, p.4), is modified and utilised to structure the description of the research design of this study to ensure that all aspects are covered.

5.3.2 The Steps of the Research Design

TABLE 5.1: Steps of the Research and Accompanying Topics (Source: author, modified from PVC, 2007)

Research Steps	Accompanying Topics
(1) Select a framework for analysis	• Rationale for single embedded case study approach selection • Choosing the context of study, and information about this field of study
(2) Select level and units of analysis	• Level of analysis chosen • Units of analysis chosen
(3) Identify stakeholders	• Stakeholder selection • List of relevant stakeholders
(4) Select appropriate forms of data to be collected	• Sources from which data is collected
(5) Select appropriate methods of data collection	• Document selection method (key word search – stakeholder and topic) • The semi-structured interview – Interviewee selection, designing questions and probes, developing the protocol
(6) Select appropriate methods of data analysis	• Method of analysis • Method of document analysis • Method of analysis for documents and interviews
(7) Collect data	• Following the described methods • Interview method description, including recording • Issues facing research fieldwork and techniques to cope with these (e.g. bias in qualitative research) • Constructing a chain of evidence • Constructing the case study database • Peer and informant review • Ethics in research
(8) Analysis and findings of the Data	• NVivo • Issues facing data analysis and methods to cope with these • Reporting findings and drawing conclusions

The eight-step model was developed based on the PVC (2007) seven-step model which comprises: (1) selecting a framework for analysis, (2) selecting unit/level of analysis, (3) identifying stakeholders, (4) selecting appropriate data collection and analysis, (5) collecting

data (process of it), (6) analysing data, and (7) decision-making and action. Steps one to six will structure the description of the research method followed in this study (shown in Table 5.1), but will be modified and split up in order to facilitate thoroughness. The seventh step of the PVC model, however, is not relevant to this study, and so will be excluded. Therefore step seven becomes relevant for collection of the data and step eight relates to analysis and findings of the data. Table 5.1 provides a summary of topics discussed under each step heading.

5.3.2.1 Step 1: Selecting an appropriate framework for analysis

An appropriate framework of analysis is required in order to establish a clear and shared understanding of what is to be analysed, and the role of the analysis. Therefore, the description of, and explanation for, the selection should be holistic and identify key themes and issues relating to the study, to better understand the complex nature of reality.

This step includes the explanations and justifications for choosing the following: a single-embedded case study approach, and the context of study. The choice of a single-embedded case study has been discussed earlier in this chapter in section 5.2.2 and the reason for choosing the context of the study and information about his context has been addressed in chapter 1, section 1.4. Therefore, step 2 will now follows.

5.3.2.2 Step 2: Select unit/level of analysis

This step involves the selection of the unit/level of analysis to facilitate the planning of the scope and focus of the analysis and selection of the methodology. The level and units that the researcher intends to study – individual, organisational, sector, national, regional, or international – and the type of information the researcher wants will determine the type of methods used (PVC, 2007). This, therefore, necessitates a statement of what units and/or levels have been selected for this study. This section states and justifies the level of analysis and units of analysis chosen, below.

Levels of analysis

Case study designs vary in the number of levels of analysis. In a single-embedded case study, there can be more than one level of analysis against which the case can be analysed through (Yin, 1989, p.49). As the case is a complex one, using multiple levels of analysis provides the

opportunity to view it from various standpoints. Another reason for selecting multiple levels of analysis is their availability. For these reasons, multiple levels of analysis are used in this study.

The levels of analysis used for this study are the *sector level,* in order to establish the similarities and differences between sectors in terms of how they perceive, and what they are saying and doing about, environmental issues in the Maldives, and whether this influences the action of other sectors towards environmental issues; the *organisational* level, in order to determine whether similarities and/or differences exist between organisations within sectors, and whether this influences organisational action towards environmental issues; and the *national* level, in order to find out whether, and if it does in what way and to what extent, the stakeholder components influence the overall ability of the Maldives to cope with environmental issues.

Units of analysis

Yin (2009, p.30) states that, as a general guide, the definition of the unit of analysis is related to the analysis that the research aim adopts. The units of analysis must be actors in the Maldives that are likely to be significantly affected by environmental issues and/or are under pressure to do something about them and/or have written about what is or what should be being done about environmental issues in the Maldives. The following sectors were included: public, international organisations, private, third/voluntary and the local community. From these criteria, three broad units of analysis can be identified; from which stakeholders are drawn see Table 5.2.

Yin (1989, p.50) points to problems that can arise from focusing on units at multiple levels in single-embedded case studies. For example, including sub-levels, such as the organisational level, may risk focusing too much on these levels to the detriment of higher levels, such as the sector and national levels. In this study, this risk is accounted for in the analysis, so the organisational level analysis is returned to the higher sector and national levels.

TABLE 5.2: Units of Analysis that were the Focus of this Study

Level of analysis		
National	Sector	Organisational
All relevant stakeholders collectively	Government (or public) sector	Departments within the government
	Tourism (or private) sector	Resorts, tour operators, businesses involved in resort development, tourist transportation businesses
	Third/voluntary sector	Non-governmental organisations (NGOs)
	International	Inter-governmental organisations, international banks
	Local Community	Local Atoll Councils

5.3.2.3 Step 3: Identify stakeholders

This step is taken in order to provide expert knowledge, ensure ownership of findings (PVC, 2007), and ensure that the perspectives, beliefs, opinions and actions of as many actors who are affected by environmental issues and/or by the activities of others in relation to environmental issues in the Maldives are accounted for. This section reports the stakeholders that are focused on in this study and includes a table listing these by sector; the specific stakeholders selected from which data are collected is discussed in later sections.

Stakeholder selection

Research indicates that there are a large number of stakeholders in SIDS, or associated with SIDS, thatare influenced by environmental issues, are affected by the activities of others in relation to environmental issues, and/or influence those in SIDS through their environmental-related activities. The steps that were followed to identify and select stakeholders, are adapted from Renard (2004). Renard (2004, p.7) points out that instead of merely listing stakeholders, their identification needs to begin with an examination of the functions of the sectors, and organisations within these, being analysed, see figure 5.1.

STEP 1: List the sectors that are to be analysed in relation to what they are saying and doing about environmental issues in the Maldives (see Table 5.2).

STEP 2: List the functions and/or main activities of each sector that are likely to be influenced by, or influence the activities related to, environmental issues in the Maldives.

STEP 3: Identify the groups or actors that have a stake in each of these functions and/or activities by asking the following questions:
- Who comprises the sector?
- Who benefits from the sector? Who wishes to but is unable to do so?
- Who do environmental issues within the sector affect?
- Who impacts the sector – positively or negatively – through environmental actions or otherwise?
- Who has the rights and responsibilities over responses to environmental issues within the sector?
- Who would be affected by a change in the status or outputs of environmental issues, or the regimes and activities aimed towards environmental issues?
- Who makes decisions that affect activities towards environmental issues, and who does not?

These questions should be answered using discussions with key persons, literature reviews and personal experience.

FIGURE 5.1: Steps to Follow to Identify the Stakeholders to be Included in the Study (Adapted from Renard 2004, p.8).

This exercise was carried out in order to identify the stakeholders to be included in this study; see Table 5.3 below.

TABLE 5.3 Stakeholder Identification Exercise

Sector	Function	Stakeholders
Public	Regulation of activities that affect the environment	MTAC ME
	Policy setting to influence how individuals and organisations respond to environmental issues	MTAC ME
	Implementation of measures to combat environmental issues	ME NDMC
	Monitoring and enforcement of policies and measures to deal with environmental issues	MTAC ME MMRC* MMO* MMPRC*

Sector	Function	Stakeholders
		NDMC
	Coordination between sectors	MTAC ME MMRC MMO NDMC
	Dissemination of environmental information	ME MMRC MMO MMPRC NDMC
Private (tourism)	Accommodation	Tour operators Resorts
	Recreation	Tour operators Resorts Recreational businesses
	Transportation	Tour operators – TUI, Kuoni, Thompson, Thomas Cook, Cosmos Resorts Sea planes Boats
	Sales and reservations	Tour operators Resorts
	Service providers	Environmental consultants – SEAMARC Businesses
	Business associations and groups	Tourism trade associations – MATI, MATATO, LAAM
Third / Voluntary	Monitor environmental issues and the impacts on individuals and communities	Red Crescent Maldives Bluepeace Mangroves for the Future Maldives Local Communities Marine Conservation Society
	Research and disseminate information on environmental risks and issues	Red Crescent Maldives Bluepeace Maldives Mangroves for the Future Maldives Live and Learn Maldives Marine Conservation Society
	Lobbying of, and liaising with, the government and other stakeholders	Red Crescent Maldives Bluepeace Maldives Mangroves for the Future Maldives
	Design and implement actions/projects/programmes to combat environmental issues and/or the damage these cause to residents and/or that improve the living standards of those affected by	Red Crescent Maldives Mangroves for the Future Maldives Live and Learn Maldives Local Communities

Sector	Function	Stakeholders
	environmental issues	
International	Research and disseminate information on environmental issues and their impacts	UNDP and UNEP ADB and World Bank IUCN WTO
	Generate policy recommendations to combat environmental issues	UNDP and UNEP ADB and World Bank Other National Governments IUCN WTO
	Liaise and coordinate between sectors	UNDP and UNEP ADB and World Bank IUCN WTO
	Design and implement interventions to combat environmental issues and/or the effects of environmental issues and/or to reduce the impact on residents of these environmental issues	UNDP and UNEP ADB and World Bank IUCN
	Finance measures to combat environmental issues	UNDP and UNEP ADB and World Bank Other National Governments

MTAC – Ministry of Tourism, Arts and Culture
ME – Ministry of Environment
MMRC – Maldives Marine Research Centre
MMO – Maldives Meteorological Organisation
MMPRC – Maldives Marketing & Public Relations Corporation
NDMC – National Disaster Management Centre Maldives
ADB – ASIAN DEVELOPMENT BANK
IUCN – INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE
UNDP – UNITED NATIONS DEVELOPMENT PROGRAMME
UNEP – UNITED NATIONAS ENVIRONMENT PROGRAMME
*Monitoring only

These identified stakeholders are used to structure the data collection, discussed below.

5.3.2.4 Step 4: Select appropriate forms of data

Data should be appropriate to the scale, scope and purpose of the study, and of a quality that enables the research aim to be achieved. As alluded to previously in section 5.2.2, in a single-embedded case study, there is the potential to use a variety of sources and types of information in order to capture the complexity of the phenomena being investigated. This section considers from where data to be analysed should be sourced.

Data sources

Yin (1994) has identified six sources of data for case study research, each requiring different skills from the researcher; not all, though, are essential in every case study. However, data collection should be designed in a way that enhances both validity and reliability; multiple sources is considered amongst the most effective measure to ensure this (Stake, 1995).

The six sources identified by Yin (1994) are documentation, archival records, interviews, direct observation, participant observation, and physical artefacts. None of these sources has an absolute advantage over the other, but may be complementary when used together. This study used documentation and interviews to gather data. Documentation provides authoritative reports of what should be being done, activities that have been, are being, or will be undertaken, and challenges and barriers faced by those implementing activities in relation to responses to environmental issues in the Maldives.

According to Wolff (2004b, p.284) documents are standardised artefacts; they can come in certain formats such as notes, reports, contracts, drafts, diaries, statistics, annual reports letters and expert opinions, among others. However, Prior (2003, p.2) suggests that if researchers are to get to grips with the nature of documents, then they have to stop considering them as stable, static and predefined artefacts; instead they should be considered as fields, frames and networks of action (which will be undertaken by this present study); therefore the status of things as 'documents' depends on the way in which objects are integrated into fields of action. Flick (2009, p.256) suggests that when a researcher decides to undertake an analysis of documents, certain distinctions should be taken into account; for example, whether to use solicited (specifically produced for the purpose of your study) or unsolicited (meaning unobtrusive and created for a different purpose other than for one's study) documents. Documents can also be distinguished in terms of those that are produced for administrative purposes on a systematic and regular basis, and those documents that are created rather less frequently and on a more confidential basis (Lee, 2000; Webb *et al.,* 1966).

Scott (1990, p.14) distinguishes 12 types of documents, which are composed of a combination of two dimensions: authorship and access. The former category can be divided into personal and official documents, and the latter can be divided into private and state

documents. Flick (2009, p.256) suggests accessibility is the classifying term for all these documents, which can be classified into four sub-types: closed, restricted, access open archival and open published (Scott, 1990, pp.14-18).

The study used unsolicited documents as these enabled greater scope and longer timeframes to be considered and analysed, and also allowed for a broader range of chosen stakeholders' documentation to be collected and analysed. In terms of the document distinction set out by Webb *et al.,* (1966) and Lee (2000), both those generated on a frequent basis and those created less often were considered provided that they fit the criteria (see below). This is the same for the distinctions that both Scott (1990) and Flick (2009) mention – provided that the documents fit the criteria and are relevant to the research aim they were considered for inclusion in the document analysis.

Flick (2009, p.257) states that documents are not simply data that can be used as a resource for research; at the same time, the researcher should focus on the documents that they use as a topic of research in terms of their features and the particular conditions of their production. He recommends that documents should not be used as 'information containers'; rather, they should be seen and analysed as 'methodologically created communicative turns' in constructing versions of events (2009, p.259). Atkinson and Coffey (2004, p.58) view documents as a distinct level of reality and suggest that they should be examined in terms of the context within which they were produced; they form a separate reality referred to as 'document reality' and therefore should not be taken to be transparent representations of social reality. Wolff (2004b) echoes this view by suggesting researchers should not start from a notion of factual reality in comparison to the subjective views of interviews. Therefore, it is difficult to use documents to validate interview statements, and rather they should be used as a way of contextualising information.

When using documentary resources, the researcher is faced with the choice of having a representative sample of all documents of a certain kind, or purposively selected documents to reconstruct a case. Also, there are usually problems with access in terms of being blocked from obtaining some documents, and inabilities in understanding content in some documents due to problems with deciphering words, abbreviations, codes and/or references. In addition, the researcher has to contend with the issue of inter-textuality of

documents, which means that documents often refer to other documents in the way they document and construct reality (Flick, 2009).

Due to the limitations of using just one data source, and the weaknesses associated with documents as a data source, interviews were used. In order to corroborate the findings of the documentation, enhance the reliability of the study, and probe deeper into the causes of any inconsistencies between what stakeholders say they are doing and what is actually being done in response to environmental issues in the Maldives, interviews were carried out with a broad array of stakeholders.

Semi-structured interviews were used in this study; this is because there are multiple topics that had to be covered in the investigation, so by structuring the interviews, it was ensured that all these topics were covered. However, in the interviews, it was desired that interviewees had the opportunity to expand on their answers so that the data collected would be rich and extensive, and issues of particular concern to individual interviewees could be explained and justified by them.

Scheele and Groeben (1988), like this study, based their approach to semi-structured interviews on subjective theory, which implies interviewees have a complex repository of knowledge about the topic under study, which includes assumptions that are explicit and immediate, and are complemented by implicit assumptions. Interviewees need to be supported by methodological aids through the use of different kinds of questions to reconstruct the interviewee's subjective theory about the issue under study (Flick, 2009, p.156).

There was scope for the 'expert interview' (Meuser and Nagel, 2002) in this study because government representatives were used and included those who are experts in their field, as well as those in resorts, businesses and the third/voluntary sector. Their perspectives were incorporated into the study representing different sectors (Flick, 2009, p.165).

Government interviews can create insights into policy and planning and fill information gaps, through process knowledge and context knowledge (Meuser and Nagel, 2002, p.76). However, Meuser and Nagel (2002, pp.77-79) warn that the interviewer may restrict and determine the expertise of interest and interviews could fail for a number of reasons; these

include expert blocking the interview by actually not being an expert, expert tries to involve the interviewer in on going conflicts, more private-person knowledge is gained than expert knowledge, and the information generated by the interview misses the topic.

By combining document and interview data, the data collection process was comprehensive enough to capture the different elements of the information the study is was to obtain, without becoming too complex a process (PVC, 2007).

5.3.2.5 Step 5: Select appropriate methods of data collection

This step is to ensure that sufficient data are collected from each form of data, and that these are representative of all the available information on the topic from that source. This section explains and justifies the following: document selection method, interview questions development, interviewee selection method, and interview method.

Document selection method

There is a substantial volume of documentary items that exist on environmental issues. Bryman (2008, pp.521-22) claims that official documents – which this study aims to make use of – can be derived from both the state and from private sources. The state is potentially a great source of information, especially in terms of statistical data and textual material, such as acts of parliament and official reports. Private sources are heterogeneous in nature: some are available in the public domain, such as on the internet, whereas other documents may be kept internally and thereby rather difficult to obtain.

Due to this high volume and heterogeneity of documents, the search criteria used to collect documents for analysis must be highly specific to ensure that the documents analysed are relevant to fulfilling the research aim and providing an adequate insight into the problem of environmental issues in the Maldives, and what is affecting stakeholders' responses to environmental issues.

In order to select documents to analyse, firstly, key words were entered into internet search engines. These key words were those identified from the literature review, and included the following: 'Maldives' (all documents must have fulfilled this criteria to have been selected), 'environment', 'climate change', 'barriers', 'limitations', 'constraints', 'waste management',

'sea level rise', 'resilience', 'adaptation', 'mitigation', 'capacity', 'disaster', 'risk', 'vulnerability', 'biodiversity', and 'coral reefs'. Second, stakeholders were approached separately and documents were requested from them. Finally, particularly for tourist resorts, stakeholder websites were accessed for information on what environmentally-related activities they report that they are doing, or intend to do.

As search engines produce huge numbers of search results, and there are generally such a large number of potentially relevant documents, those documents selected for analysis were only those produced by the identified stakeholders and were assessed in terms of their quality; Scott (1990, p.6) suggests four criteria, which were the criteria employed for this study in document selection: authenticity, credibility, representatives and meaning Bryman (2008, p.516) deems these criteria as an extremely rigorous set of criteria against which documents can be gauged.

Based on the methods followed to search for documents, and the four criteria outlined, 28 government documents, 18 international organisation documents, 11 third/voluntary sector documents, and 22 private sector documents were selected and analysed. See Appendix 1 for a list of the selected documents from the Maldives Government, Third/Voluntary Sector, International Organisations and the Private Sector. Themes from these documents were used to outline the semi-structured interviews.

The Semi-Structured Interview

Interviewee Selection

Selected interviewees must be representative of the stakeholders relevant to this study. Therefore, the sample was stratified based on the stakeholder sectors. These were then stratified (if possible) based on groups within the stakeholder sector; for example, in the third/voluntary sector, the groups included communities and NGOs. Methods of selection varied between stakeholder groups depending on the number of groups or individuals that make up that stakeholder group, and their availability. See table 5.4 for steps taken to select interviewees from each stakeholder category. For the list of actual interviewees selected, see appendix 3.

TABLE 5.4: List of Methods of Interviewee Selection

Stakeholder sector	Stakeholder group	Interviewee selection
Public	Government	Not all government departments are concerned with environmental issues in the Maldives, therefore only those departments whose role is predominantly related to environmental issues and activities relating to these, within the boundaries of the research aim were selected. Of these departments, a directory was obtained, and the most senior individuals whose role was related to environmental issues and climate change were contacted for interview.
Private	Tour operators	There are quite a large number of tour operators. However, there are five tour operators that make up a significant market share; all five were selected for interview. A directory was obtained for each, and a resident representative from each was contacted for interview.
	Resorts	There are approximately 104 resorts in the Maldives at the time of this study. Sixty per cent of resorts were local-owned, and 40 per cent were foreign-owned, so this was stratified into local-owned and foreign-owned resorts. A sample of approximately 20 per cent of the total number of resorts was considered sufficient. Twenty three resorts were randomly selected, 60 per cent (14) were randomly selected from the local-owned group, and 40 per cent (nine) were randomly selected from the foreign owned group.
	Transport	Over 70 per cent of all tourists in the Maldives travel to their chosen destination by seaplane, of which there are two in total. Others may take speedboats owned by the resorts, which take a very small proportion of total visitors. Therefore, seaplane companies were targeted for interview. The directory of each of these seaplane companies was obtained, and the managing director of each was contacted for interview.
	Service providers	The precise number of consultants is unknown due to the presence of many informal ones. Because of this, judgment sampling was employed to select three consultants; their selection was based on reputation and the literature that they had produced. Directories were obtained for each, and contact was made with the most senior consultants of each.
		There are a vast number of businesses providing services, such as providing equipment to resorts. Snowball sampling was used in this case, as a small number of business names frequently came up in interviews with tourism stakeholders. In addition, judgment was used to establish whether these businesses' operations were relevant to the research

Stakeholder sector	Stakeholder group	Interviewee selection
		aim. Once this was determined, the chosen businesses (four in total) were made contact with via email, and the researcher was directed to a representative seen as most appropriate to answer the questions posed.
	Trade associations	There are three main trade associations related to tourism in the Maldives. All of these were selected. A directory was obtained for each, and the most senior operators of the organisations were contacted for interview.
Third / Voluntary	International NGOs	Red Cross/Red Crescent were considered the main international NGO in the Maldives and a representative was contacted for interview.
	Local NGOs	There are a broad range of NGOs in the Maldives, but a very limited number that are relevant to the research aims of this study. Therefore, judgment sampling was employed to select NGOs. Of the selected NGOs, directors of them were interviewed as they were considered to be the most knowledgeable on the organisation's operations, values and priorities.
International	UN	Of the UN, only the UNDP operates directly in the Maldives, therefore, it was only the UNDP that was considered relevant to interview. A UNDP Maldives directory was obtained and the individual responsible for activities related to climate change and the environment was contacted for interview.
	International development bank	Out of the main donor banks the Maldives has access to, the ADB was identified as a significant development funder and cropped up frequently in the policy and institutional literature. Through a web search the individual responsible for activities related to climate change and the environment was contacted for interview.
Local community	Atoll Councils	Atoll Council leaders from the north, west, south, east and central regions were identified and contacted for interview.

Designing questions and probes

The purpose of the semi-structured interviews is to corroborate findings from documents, fill in gaps and identify issues that were not covered in the documents; to establish from selected stakeholders their personal knowledge, values, priorities and experiences of environmental issues and their responses to these in tourism-dependent Maldives; and also to uncover the social networks and relationships that exist around these issues, and how these impact their environment-related activities.

There are three types of questions that can be posed in semi-structured interviews: *descriptive*, where people are asked to describe phenomena and these may provide insights or suggest areas for query that the researcher may not have previously considered; *structural,* which helps the researcher comprehend relationships between things, and categorise like things or processes into groups; and *contrast,* which assist the researcher in understanding what terms mean (Harrell and Bradley, 2009, p.35).

All three types of question are required in order to fulfil the purpose of the interviews. In terms of descriptive questions, interviewees are required to describe their experiences and perceptions of events, occurrences and/or activities related to environmental issues in the Maldives, and provide examples. For structural questions, cover-term questions aim to establish whether the interviewee perceives key themes identified by the researcher as problematic and requiring action. The cover-term questions aim to put what an interviewee has said in context and so broadening the researcher's understanding of the perceptions of the stakeholder. In terms of contrast questions, rating-type questions help to establish what issues the interviewee considers as priority areas and which are less important.

The actual questions posed, which acted as the interview 'skeleton' to structure the interviews around particular topics were determined by the key themes identified from the analysis of the documents produced by stakeholders, which is discussed below (see Appendix 4). However, the actual interview criteria in terms of depth, target and specificity cannot be realised in advance; they will depend on the actual interview situation and how it goes (Flick, 2009). Saunders *et al.,* (2009, p.232) mention that qualitative research may use non-standardised interviews due to the purpose of the study in question, the significance of establishing personal contact, the nature of the data collection questions and the length of time required to complete the process.

Semi-structured interviews often begin with an open question and end with a confrontational question (Flick, 2009). There is scope for confrontational questions in order to examine issues to obtain greater insight; these questions need to have a 'thematic opposition' to the interviewee's statements (Flick, 2009, p.157). These will very much depend on the direction of the interview and the responses given by the interviewee.

Zorn (n.d. p.1) offers a list of recommendations when preparing for the semi-structured interviews which are particularly useful as they are aimed at ensuring the interviewer encourages the interviewees to articulate their perceptions and opinions on the topics of interest. The foundational principles of Zorn's recommendations are to avoid leading the interview or imposing meanings and furthermore create a relaxed comfortable conversation.

The researcher may omit some questions in semi-structured interviews due to context in relation to the research topic, and the order of questions will vary depending on the flow of conversation. However, in certain situations, the researcher may have to use additional questions to explore the main research aim of the study (Saunders *et al.,* 2009, p.320). The desired outcome of the interviews was to have obtained from interviewees statements of their existing knowledge, values, priorities, perceptions and experiences in relation to environmental issues in the Maldives in a way expressed in the form of clear and comprehendible answers, thus ensuring ease of interpretation (Flick, 2009, p.160).

A number of problem questions can potentially be asked such as: double barrelled, unfamiliar jargon, double negatives, emotional language, vague and beyond the understanding of the interviewee (Harrell and Bradley, 2009, p.42).   A great deal of care was taken to ensure that these types of questions were not included by reviewing them numerous times, and rewording any questions that were potentially problematic.

Piloting and pre-testing questions is important as this can highlight potential problems and issues the interviewer may come across; it gives the researcher practice and increases their confidence; interview question and style can be adjusted accordingly to acquire the relevant information; and the researcher can gauge if their introduction and rationale of their research given to participants is understood and better received (Bryman, 2008, p.248). The interview questions were pre-tested with a tourist resort and a number of colleagues, and peer reviewed. The questions were found to be well received, clear and understandable.

Probing is sometimes necessary to stimulate the interview, and interviewers using probing questions when they do not completely understand what the interviewee has said and require further clarification; the question indicates that the interviewer should probe

deeper; the interviewer wishes to follow up on a specific issue; or the interviewer feels that the interviewee has not told them everything they can (Harrell and Bradley, 2009, p.44). The use of probes is determined by the interviewer listening very attentively to the interviewee's responses, in order to determine whether they are clear and complete.

Probes must be neutral and extract further information without biasing the interviewee's responses. Probes must be taken into account in the current study's interviews when wishing to elicit a more rounded response from interviewees. They ensure the interviewer can gain clarity and specificity as well as more complete answers to questions (Harrell and Bradley, 2009, p.45). Potential problems with probes do exist. Firstly, the response of 'I don't know' may in fact mean just that, and so probing may encourage interviewees to provide responses that are not true, or that are guesswork. Secondly, if the probing encourages interviewees to provide painful and personal information, there are significant ethical issues associated with using this information.

Developing the Protocol

Protocols enable the researcher to structure the interview. They are necessary in order to clarify questions and identify probes; ensure that interviews are consistent, whereby, as all interviews are carried out by the researcher, interviewer bias is kept to a minimum, but it is important that there is consistency across interviewees to maximise comparability; and prioritise questions, which is necessary as interviews are time-limited (Harrell and Bradley, 2009, p.49). A protocol is only for the interviewer's use, as if the question list is provided to the interviewee beforehand, they may provide only official or prepared answers; or if one interviewee receives the questions before, whereas the rest do not, interview data will be inconsistent, and so not comparable.

The protocol particularly concerns the ordering of the different questions posed. There are four different protocol schemes, which are: Funnel (broad questions leading to more focused questions); Inverted (narrow questions leading to broad discussions); Tunnel (avoids broad questions especially when time is limited): Quintamensional Method (assesses intensity of opinions) (Harrell and Bradley, 2009, p.50).

The study employed an inverted funnel protocol, as this was considered most appropriate for first establishing the interviewees' positions on the specific topics of concern with relatively narrow questions, and then delving deeper into the reasons for these positions. In addition, a quintamensional protocol was integrated into the interview, as this was particularly useful in determining the intensity of interviewees' perceptions and attitudes; Harrell and Bradley (2009, p.50) claim that five steps assess these intensities: (1) the degree of awareness of an issue, (2) uninfluenced attitudes, (3) specific attitudes, (4) reasons for these attitudes, and (5) intensity of these attitudes.

Harrell and Bradley (2009, p.52) recommend that protocols should follow the following format: introduction; setting ground rules (safeguarding, assurances of reporting of the data); questions and probes; final thank you and explanation of the next steps (possibility of a follow up survey).

The interview protocol that was developed for this study can be found in Appendix 4.

Interviewees of the study can be found in Appendix 3.

5.3.2.6 Step 6: Select appropriate methods of data analysis

The researcher, according to Yin (2009, p.160), has the responsibility to ensure their analysis is of the highest quality; analysis should address the most significant aspect of the case study and therefore the researcher should avoid making detours to less relevant issues.

Methods of analysis

The data analysed in this study was all in textual form – the documents written by stakeholders were text, and the semi-structured interviews were transcribed and so were textual. Ryan and Bernard (2000, p.771) distinguish between textual data as proxy for experience, and as object of analysis, with the former group being split into systematic elicitation and free-flowing text; they then provide a typology of qualitative analysis techniques suited to each. This study used text as a proxy for experience; in addition, all data collected in this study was in the form of 'free-flowing text', therefore an analytic strategy that follows this branch in figure 5.2 is the most appropriate for this study. These

strategies were each considered in order to justify the choice of analytic strategies that were used in this study.

FIGURE 5.2: Typology of Qualitative Analysis Techniques (Source: Ryan and Bernard, 2000, p.771).

The analysis of free-flowing text can follow one of two forms: either by segmenting text into its basic meaningful components, i.e. words; or where meanings are found in large chunks of text (Ryan and Bernard, 2000, p.775). Both of these types, and their associated analytic strategies, see Table 5.5.

Table 5.5: Analysis Strategy (A) The Range of Methods of Analysis of Words, (B) Range of Coding Methods for Chunks of Text, (C) Range of Analysis Methods for Building Conceptual Models for Chunks of Text (Source: Ryan and Bernard, 2000, pp.775-789)

(A) Analysing words – all strategies reduce text to the fundamental meanings of specific words, which make it easy for researchers to identify general patterns and make comparisons across texts.

Analysis strategy	Explanation
Key-Words-In-Context (KWIC)	These are lists created by finding all the places in a text where a particular word or phrase appears and selecting it in the context of some number of words before and after it, thus producing a concordance.
Word Counts	Useful for discovering patterns of ideas in any body of text. Can help researchers to discover themes in texts. This form of analysis considers neither the contexts in which words occur nor whether the words are used negatively or positively, but distillations like these can help researchers to identify important constructs and can provide data for systematic

Analysis strategy	Explanation
	comparisons across groups.
Semantic Networks	Examines the properties that emerge from relations among things. The value of this in turning qualitative data into quantitative is that it can produce information that engenders deeper interpretations of the meanings in the original corpus of qualitative data – it is hard to see patterns in words without some kind of data reduction. Often done by computer, so avoids investigator bias. However, there is no guarantee that the output of any word co-occurrence matrix will be meaningful, and it is very easy to read patterns – and so meanings – into any set of items.
Cognitive Maps	Combines the intuition of human coders with the quantitative methods of network analysis. It is supposed that if cognitive maps or schemata exist, they are expressed in the text of people's speech and can be represented as networks of concepts. It is found useful to illustrate these maps through map diagrams. However, in this method, a lot depends on who does the coding, as different ones will produce different maps by making different coding choices.

(B) Analysing chunks of text: coding – all analysis of chunks of text first requires coding of the text; coding forces the researcher to make judgments about the meanings of blocks of text. It is then these codes that are analysed. Different methods of coding include:

Analysis strategy	Explanation
Sampling	A corpus of texts is first identified. Selection can be purposive or random. Samples may be based on extreme or deviant cases, cases that illustrate maximum variety on variables, cases that are somehow typical of a phenomenon, or cases that confirm or disconfirm a hypothesis. Second, the units of analysis within the texts are selected. Units may be entire texts (books, interviews, question responses), grammatical segments (words, word senses, sentences, themes), formatting units (rows, columns, pages), or chunks of text that reflect a single theme.
Finding themes	Themes are abstract constructs that researchers identify before, during and after data collection. Literature reviews, professional definitions, local common-sense constructs, researchers' values and prior experiences are all rich sources of themes. Methods used to induce themes include: careful line-by-line reading of text while looking for processes, actions, assumptions, and consequences (Grounded theorists); looking for metaphors, word repetitions, shifts in content (schema analysts); use of KWIC to identify different meanings (content analysts); look for evidence of social conflict, cultural contradictions, informal methods of social control, methods people use to acquire and maintain achieved and ascribed status etc.
Building codebooks	Codebooks are organised lists, sometimes hierarchies, of codes. They should include a detailed description of each code, inclusion and exclusion criteria, and exemplars of real text for each theme. Coding is supposed to be data reduction, used to identify or mark the specific themes in a text. The development and refinement of coding categories have long been a central task in classical content analysis, and are important in the construction of concept dictionaries. The codebook is often ambiguous and confusing.

Analysis strategy	Explanation
Marking texts	Coding involves assigning codes to contiguous units of text. Codes act as tags to mark off text in a corpus for later retrieval or indexing (associated with grounded theory and schema analysis); and codes act as values assigned to fixed units (associated with content analysis and content dictionaries).

(C) Analysing chunks of text: building conceptual models – once a set of things, such as themes, concepts, beliefs and behaviours, have been identified, the next step is to identify how they are linked to each other in a theoretical model, which are sets of abstract constructs and the relationships among them

Analysis strategy	Explanation
Grounded theory	Aim to understand people's experiences in as rigorous and detailed a manner as possible to identify categories and concepts that emerge from text and link these into substantive and formal theories. It is an iterative process by which the analyst becomes more and more "grounded" in the data and develops increasingly richer concepts and models of how the phenomenon being studied really works; to do so the researcher collects verbatim transcripts of interviews and reads through a small sample of text, identifying potential themes by pulling together real examples from the text. As coding categories emerge, the researcher links them together in theoretical models; one technique is to compare and contrast themes and concepts (contrast comparison method), another is the conditional matrix. Memoing is a main technique for recording relationships among themes. Once the model begins to take shape, negative case analysis is used to identify problems and make revisions. The end result is often displayed through the presentation of segments of text (quotes) as exemplars of concepts and theories; also, theoretical results can be displayed in concept maps of the major categories and relationships among them.
Schema analysis	Based on the idea that people must use cognitive simplifications to help make sense of the complex information to which they are constantly exposed. Schemata are said to enable culturally skilled people to fill in details of a story or event. Begins with careful reading of verbatim texts and seeks to discover and link themes into theoretical models. The search for schemata in text often involves metaphors, proverbs, and repetition of associative linkages.
Classical content analysis	Comprises techniques for reducing texts to a unit-by-variable matrix and analysing that matrix quantitatively to test hypotheses; a matrix is produced by applying a set of codes to a set of qualitative data. It assumes that the codes of interest have already been discovered and described. Once a sample of texts has been selected, each unit is coded for each of the themes or variables in the codebook, producing a unit-by-variable matrix that can be analysed using a variety of statistical techniques. Coding of texts is often assigned to multiple coders so researchers can see whether the constructs being investigated are shared and whether multiple coders can reliably apply the same codes.
Content Dictionaries	Computer-based, general-purpose content analysis dictionaries allow investigators to automate the coding of texts. To build, researchers assign words by hand to one or more categories according to a set of rules. They

Analysis strategy	Explanation
	are attractive as they are reliable and automated, however, they may be offset by a decrease in validity as only humans are able to parse certain subtleties of meaning reflected in context.
Analytic Induction	A formal, non-quantitative method for building up causal explanations of phenomena from a close examination of cases. The steps are as follows: (1) define a phenomenon that requires explanation and propose an explanation; (2) examine a case to see if the explanation fits, and if so then examine another case, and if not then under the rules of analytic induction, the alternatives are to change the explanation or redefine the phenomenon. This ideally continues until a universal explanation is found.
Ethnographic Decision Models	Qualitative, causal analyses that predict behavioural choices under specific circumstances. It is often referred to as a decision tree or flowchart, and comprises a series of nested if-then statements that link criteria to the behaviour of interest. It combines many of the techniques employed in grounded theory and classic content analysis. They require exploratory data collection, preliminary model building, and model testing. The steps are: (1) researchers identify the decisions they want to explore and the alternatives that are available; (2) researchers conduct open-ended interviews to discover criteria people use to select among alternatives; (3) researchers systematically collect data about how each criterion applies or does not apply to a recent example of behaviour; (4) data are then used in building a preliminary model and in testing its postdictive accuracy. It is very labour-intensive, and so restricted to relatively small and homogenous populations.

Method of document analysis

The purpose of initial analysis of the documents produced by stakeholders was to identify the key themes related to environmental issues, the impact of these themes, and what was being said and done about limits and barriers to stakeholders' responses to environmental issues in the Maldives, in order to structure and ensure that all key topics were covered in the semi-structured interviews. The most appropriate form of analysis for this task was considered as a form of word analysis, which reduces the large volume of document text to the fundamental meanings of specific words, therefore, increasing the ease with which the researcher can identify general patterns and make comparisons across all the textual document data (Ryan and Bernard, 2000, p.779).

It was desired that the form of word analysis chosen maintained the context within which the key words occurred so that subtle nuances were protected, and the stance of the stakeholders was conserved in order to assist later comparison between stakeholders with

regards to these key terms, where the usage of these key terms could be developed into themes.

From the strategies outlined in Table 5.5, the most appropriate word analysis method was identified as Key-Words-In-Context (KWIC). This strategy involves looking closely at the words used in documents in order to understand what stakeholders are discussing. This method first identifies key words or phrases and then systematically searches the text to find all instances of each of the key terms (Ryan and Bernard, 2003, p.97). By focusing on identifying key words, this strategy helps condense and simplify the data: as each time a key words or phrase is identified a copy of it and its immediate context is made, the original context in which the key terms occur are not lost.

Whilst looking for, and identifying, themes in the documents, repetition was used. This is the easiest way as themes are those "topics that occur and reoccur" (Bogdan and Taylor, 1975, p.83). As Ryan and Bernard (2003, p.89) point out, the more the same concept occurs in a text, the more likely it is a theme. As key terms may occur in some documents but not others, each document is considered independently for key terms; but is also considered collectively with all the other documents in that key terms identified in some documents are also searched for in others, and each key term is looked at cumulatively from all the references that are made to it.

Method of analysis for documents and interviews

Following the completion of the interview phase of this study, data from both the documents and the interviews were collated into themes based on those found through KWIC, as these themes were the focus of the interviews and so provided valuable information on each. However, these data required much more in-depth analysis in order to develop an understanding of the relationships among categories, such as the perceptions of different stakeholders regarding environmental issues, the proposed and actual activities reported, reasons for any inconsistencies, and relationships between stakeholders and their activities and how these influenced other stakeholders' outlooks and activities.

A grounded theory approach to coding data and analysis was considered most appropriate to achieve this goal. As Strauss and Corbin (1998) state, grounded theory is a constant

comparative method that groups and categorises data, and then links and organises these categories by relationship, develops conditions and dimensions, and from which theory finally emerges. Although grounded theory cannot be reduced to formulaic practices, research tools can clarify the process (Wilson Scott and Howell, 2008, p.1). The method followed and tools used in this study –generated from Glaser and Strauss (1967), Strauss and Corbin (1998) and Wilson Scott (2004) – are illustrated in Table 5.6. Theoretical sensitivity is important in grounded theory as it can be used in the connection of the researcher's knowledge to what is not known about the study area, and so forces the researcher to step back and ensure that what is actually observed is found in the data. Sources of theoretical sensitivity include professional experience, personal experience of a phenomenon, the analysis process itself, and literature reviews (Wilson Scott, 2004).

TABLE 5.6: (A) Description of the Grounded Theory Steps for Coding and Analysing Data followed in this Study; (B) Elements Addressed through Questioning in Axial Coding to Develop the Conditional Relationship Guide; (C) Table for the Conditional Relationship Guide to act as a Foundation for the Discussion of the Findings. (Adapted from Strauss and Corbin 1998; Wilson Scott 2004; Wilson Scott and Howell 2008; Glaser and Strauss 1967)

(A)

Stage	Description
1. Open coding	This is concerned with identifying, naming, categorising and describing phenomena found in the text. As the KWIC method used for the initial document analysis involved reading the texts carefully and extracting themes, this acted as a foundation to the open coding stage. Each of the passages that resulted from KWIC was re-read to ensure that what it was about and what was being referenced was perceptible. The verbatim transcripts from the interviews were then read carefully and categorised into existing or new categories. Word searches were conducted that pulled out the most repeated terms used throughout each document These categories were then further broken down into recognisable sub-categories in order to simplify relationship identification.
2. Axial (or reflective) coding and construction of a 'Conditional Relationship Guide'	This is the process of relating the determinants and their properties to each other, through a combination of inductive and deductive thinking. Specific questions are asked of the categories, which fall under element headings (see B). Answering these questions weaves the loose array of concepts and categories unravelled and sorted in open coding back together into a pattern. The questions are constant-comparative in nature, ensuring that categories are constantly compared to help the researcher understand the construction of their interrelationships, and that patterns are woven into complex, dynamic three-dimensional pictures of reality.

A table was designed that was applied to each identified determinant; it accounted for each piece of data applicable to each determinant produced |

Stage	Description
	by different stakeholders (see C). This format enabled for differing elements within the same determinant held by the same stakeholder to be accounted for. This table has been called a 'Conditional Relationship Guide' as it relates structure to process, identifies the relationships and interactions of the determinants one with the others, and describes how the consequences of each category are understood. The emergence of key properties and modes of understanding the consequences is an indicator of theoretical saturation being reached.
4. Selective coding	This integrates all the interpretive work of analysis. It is the process of choosing one (occasionally more) determinant – that has a high frequency of mention, and is found to be connected to many of the other determinants – to be the key determinant, and relating all other categories to that determinant. The essential idea is to develop and explain a single storyline around which everything else is draped. It involves further developing the properties and dimensions of the key determinant, refining the order and sequence of the categories, and relating and developing the properties and dimensions of salient determinants, categories and concepts to the key determinant as an ever-widening tapestry as the lesser determinants are tied to and woven around the core via the Reflective Coding Matrix. Using the storyline as a guide, a version of the story is weaved at a higher level of abstraction, integrating structure and process in a single statement. Thus, the theory emerges. Finally, patterns and repeated relationships are looked for, and data are grouped accordingly to give the emerging theory specificity.

(B)

Element in question	Description
Determinant (What is [the category]?)	This is the concept that holds the bits together. It is sometimes the outcome of interest, or it can be the subject.
Causal conditions (When does [the category] occur?)	These are the events or variables that lead to the occurrence or development of the phenomenon. It is a set of causes and their properties.
Context (Where does [the category] occur?)	This is the specific location (values) of background variables. A set of conditions influencing the action/strategy.
Intervening conditions (Why does [the category] occur?)	These are thought of as mediating variables. They are often contrasted with context, which is considered to be moderating variables.
Action strategies (How does [the category] occur?)	The purposeful, goal-oriented activities that agents perform in response to the phenomenon and intervening conditions.
Consequences (With what consequence does [the category] occur or is [the category] understood?)	These are the consequences of the action strategies, intended and unintended.

(C) Conditional Relationship Guide

Determinant	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences

Writing theoretical memos is particularly important when applying grounded theory (Corbin and Strauss, 1990, p.422). It is the act of recording reflective notes about what the investigator is learning from the data. Using memos constitutes a system of keeping,

> "Track of all the categories, properties, conceptual relationships, hypotheses [and] generative questions that evolve from the analytical process" (Corbin and Strauss, 1990, p.422).

Memos are taken throughout the coding stages, incorporating and elaborating on the coding. In addition, the memos can be continually sorted and re-sorted to facilitate the writing-up stage. They are particularly important in ensuring that conceptual detail is not lost or undeveloped in the transition from coding to writing.

Grounded theory is a very time-consuming approach (Ryan and Bernard, 2000), as it requires the collection of substantial field data, all of which must be transcribed, coded and analysed, in addition, to document collection and analysis. NVivo was used to help organise the data (see below).

5.3.2.7 Step 7: Collect data

Collecting both document and interview data followed the selected methods of data collection discussed in step 5. For the document data collection, the method does not require discussing further. However, when carrying out semi-structured interviews, there are a number of aspects that are important, which are addressed below.

Semi-structured Interviews

Preparing for the semi-structured interview

This researcher chose to conduct all of the interviews personally, to ensure consistency throughout the interview phase and between the different stakeholders, in addition to

ensuring that all the required topics were discussed with interviewees; and that topics were expanded on where relevant and where a stakeholder has particular expertise and/or strong opinions. The interviews were conducted in the Maldives between May 2012 and September 2012.

The interviewer must be able to listen closely to the interviewee in order to determine if the question asked has been answered, and whether follow-up or probing is required; be able to gain cooperation from the interviewee; remain neutral, regardless of the responses given, and maintain the confidentiality of the interviewees (Harrell and Bradley, 2009, p.57). This researcher has previous interviewing experience from prior research, so was adept at fulfilling these criteria, probing, and avoiding refusals.

To ensure that all interviews followed the same general pattern, and no interviewee was subjected to different treatment in the interview, a protocol was developed (see appendix). It was important that this researcher was highly familiar with this protocol so as not to introduce bias into the process and distort the data in any way.

Email was the chosen method of initial contact as email addresses were found to be most accessible, and, unlike phone contact where people may not answer or there may be problems with the phone signal, an email message can be read and responded to at the convenience of the person receiving it. Also, it was decided that email would be particularly beneficial when potential interviewees had questions as it enabled a considered response from the researcher that was more likely to instil confidence in, and encourage, the individual to participate, than a stumbling, hesitant answer given in the heat of the moment. Due to the diverse nature of the different stakeholder groups, and so selected interviewees, it was expected that response times would be variable; however, all those contacted for interview responded within a week. All emails to potential interviewees contained a standardised message explaining the context, purpose and intent of the research and why it is important for that individual to participate; however, not too much was said as over-preparation of the interviewees was not desired.

There are a number of barriers that could potentially be faced when attempting to schedule interviews. It was recognised that knowing how to address, and respond to, concerns would

help to avert refusals. Harrell and Bradley (2009, p.64) suggest some responses to some common barriers: lack of interest (explain the purpose of the research and remind individual of the opportunity to be heard), time constraints (schedule for a convenient time), fear of inadequacy (reassure there are no wrong or right answers) and confidentiality concerns (explain answers will be presented without names and in aggregate form) these were found to be useful when scheduling interviews, and were used as a brief to aid and standardise responses to these concerns.

Conducting the semi-structured interview

Interview locations are important as the surrounding environment has the potential to both influence and distract the interviewee. It was not possible to conduct the interviews in the same place due to the interviewees' schedules, and many of the interviewees were highly geographically dispersed over the Maldives' many small islands. The locations chosen to conduct all face-to-face interviews were private, quiet spaces with no distractions, and were locations that the interviewees were comfortable in and familiar with.

Harrell and Bradley (2009, p.67) point to a number of items that must be covered before commencing the interview; these include an explanation of the interview process, including the likely length of the interview, the topic of questions, and whether the interviewee can refuse to answer any of the questions; an explanation of the publication process, such as public clearance or release process, and whether the interviewee is able to review the report before its release; confidentiality, anonymity, and consent; whether the interview is being recorded - if so, this needs to be approved by the interviewee; and whether the interviewee has any questions. These factors are addressed in the interview protocol, which provides a standardised introduction to the interview to ensure all interviewees are exposed to the same process (see Appendix 4).

It is essential that the researcher remains neutral throughout the interview so as not to influence the interviewees' responses and introduce bias, and so that the answers are comparable. Some general guidelines to maintain neutrality include the following: Do not suggest an answer; do not assume answers; the researcher should never give their own opinions; do not agree or disagree with the person's comments, and avoid making gestures that may indicate approval or disapproval of the answer given.

There is no 'right' behaviour for the interviewer in semi-structured interviews (Merton and Kendall, 1946). The success of the interview is determined in part by the interviewer's competence; this competence can be enhanced by experience in the field, and training.

Harrell and Bradley (2009, p.72) suggest a number of aspects that must be addressed on closing the interview: It is important to end the interview on a positive note, so appreciation to the interviewee must be expressed; confirmation of next steps, and whether there are any plans for follow-up contact; and leave contact details with the interviewee, in the event they think of more information that they wish to share, or have any further questions. These factors are addressed in the interview protocol (see Appendix 4).

Email and telephone interviewing can work similarly to semi-structured interviews, although it will not involve face-to-face interaction. In some cases, email or telephone interviews were the only possible form of contact with selected interviewees as during the field research stage the interviewees were not located in the Maldives. In the five email interviews, the researcher sent a set of questions to participants and asked them to send back the answers. There is a danger, though, that this could transform the interview into a survey; therefore Flick (2009, p.267) suggests that the design of the interview should be adjusted to send one or two questions initially, and then after the answers are received, a few more should be sent through a series of email-exchanges. This is the format for email interviews adopted in this study. The drawbacks of email interviews is that unlike face-to-face interaction that allows the researcher to explain one's expectations in a direct oral exchange and respond to participants, in the online approach, instructions are in typed form, and therefore have to be clear and detailed (Flick, 2009, p.267). The 4 email-exchange interviews were preferable to telephone or face-to-face due to the fact that 3 out of the 4 participants were not in the country, and they preferred to conduct the interview in this manner because they had busy schedules during the day.

In the 11 telephone interviews, 4 were with private sector, and 7 with atoll council leaders. This was done due to the geographical dispersion of those participants across the country and the time and resources it would have taken to travel as well as the fact that the atoll leaders often travelled so it was not guaranteed that they would be physically available on the given day due to work commitments. With the telephone it enabled the researcher to

have direct access to the interviewees. The format of the interview followed that of the semi-structured interviews, so direct oral exchange was used, and interviewer questioning was as responsive as in the face-to-face interviews. The only obvious difference from face-to-face interviews was the lack of physical presence of the interviewee in the questioning.

The total number of interviews carried out was 57: 42 of these were face-to-face, 11 were by telephone, and 4 were email-exchange interviews. Please see Appendix 3 for the details of the sectors, the timeframe within which the interviews were conducted, and the types of interview.

Capturing the data

It was decided that the most effective and least costly method of capturing the data from the interviews was to record them using a Dictaphone. This ensured that no data were lost and that the interviewer was free to concentrate on the responses given by the interviewee and respond accordingly, rather than being preoccupied with writing down what the interviewee had said. Participants understood and were quite happy for their responses to be recorded, as the benefits of it were explained to them before the interview had begun, and all agreed to participate.

Transcribing the data

The recorded data had to be transferred into textual form so that they could be analysed alongside the document data. Inappropriate or inadequate preparation of data may delay or negatively affect the analysis process. McLellan *et al.,* (2003) claim that, although there is no agreed-upon transcription format appropriate for all types of qualitative data, practical considerations and guidelines are necessary; these guidelines should assist researchers to organise and then analyse textual data.

Mergenthaler and Stinson (1992, pp.129-130) state that it is particularly important that the transcript is an exact reproduction, and a verbatim account is generated, which preserves the morphologic naturalness of the speech, keeping word forms, the form of commentaries, and the use of punctuation as close as possible to speech presentation. These points ensure that the messages of the speech are not lost in translation.

Therefore, the recorded interviews were transcribed word-for-word into a text script by the author and a third party experienced with transcription for both time-efficiency and accuracy. The scripts were then read carefully (by the author of this study) to ensure that no personal or confidential data were disclosed; in the case of names, these were changed to a neutral indicator that a person had been referred to by - see Table 5.7 for the relevant codes. This researcher took the initiative regarding other potentially confidential information, deleting where it was considered appropriate. The interview scripts were also reviewed for accuracy.

The interviewee's identity should be kept anonymous (Clark, 2006), in order to reduce bias in the analysis stage, and to fulfil the terms given to the interviewees prior to the interviews. Each interview script was labelled with the following: Interviewee ID; Interview category/sub category; Site/Location of Interview Date of Interview; Trancriber.

Research fieldwork issues

Fieldwork often requires working in a different environment or space (Hall, 2011). Clifford (1997, p.54) notes that when researchers think of working in the field, they create mental images of a distant place 'with an inside and outside' reached through physical movement. Hall (2011, p.8) mentions that contemporary fieldwork is often associated with the notion of being in a different natural and cultural environment. Flick (2009, p.106) mentions that the general term 'field' may mean a certain institution, a subculture, a family, a specific group of persons, decision-makers in administrations and even enterprises. The problem of having preconceived notions of the location of the field research was avoided in this study as the researcher had visited the Maldives on numerous occasions before undertaking this current research.

Regulation of fieldwork is also important; when it comes to locations where the researcher is not a national or a local, issues of government permissions and visas will become relevant. Hall (2011, p.14) mentions that the researcher needs to be aware of the ethics generated from the informal (etiquette and manners) and formal (rules and regulations), such as with institutions, cultures, university codes of ethics, relationships in the field, confidentiality, impact on people's lives and the use of the results. This researcher is in a privileged position regarding the current topic of research due to being a Maldives national.

The researcher also needs to be aware that the 'theoretical lens' one uses – even if multiple in its scope – will leave certain issues in while other issues will be ignored (Hall, 2011). As Hyndman (2001, p.262) mentions that field work is at once a political, a personal and a professional undertaking, the researcher is faced with the task of putting together disparate 'bits and pieces' of observations, conversations and unexpected 'adventures' into a 'coherent story with a conceptual purpose (Friedman and McDaniel, 1988, p.124). Fine (1993) suggests that researchers should be honest about their collective conceits; thus there is need for self-reflexivity. This study, by recording and transcribing interviews verbatim, ensured that during the field data collection stage the researcher's own theoretical standpoint did not interfere.

As discussed earlier in the chapter, validity and reliability are common problems faced in case study research. A number of measures were highlighted as being particularly useful in enhancing the validity and reliability of research, such as generating a case study database, constructing a chain of evidence and informant review of transcripts – these measures were included in this study during the data collection phase.

Yin (2009, p.119) argues that too often case studies are full of narrative in the report and a critical reader does not get the opportunity to examine the raw data that led to those conclusions; this limits the reliability of the case study. This issue is particularly relevant in studies that use multiple data sources and where there is multi-level analysis. To counter this problem, this study constructed a separate, fully documented database of the data collected that classified, and cross-referenced all evidence so that it could be efficiently recalled for sorting and examination during the rest of the study, and after. This database includes the references of the stakeholder documents, the interview transcripts, the KWIC analysis tables, and the grounded theory analysis tables.

Yin (2009, pp.122-123) also suggests that it is important for the researcher to maintain a chain of evidence that links the case study questions, study protocol, evidentiary sources, study database and the study report. This should allow an external observer to follow the process of the initial research question to the eventual report. Consequently, a chain of evidence document was created, using the references of the items in the case study database, to show the order in which activities in this study were carried out.

To verify the accuracy of transcripts, correct inaccuracies, ensure that the transcriber had correctly written down the interview scripts, and clarify any uncertainties from the interviews, randomly selected interviews were sent to the interviewees to read and review, thus enhancing the validity of the data.

Ethics in research

Four main issues have been highlighted in the field of ethics; these are harm to participants, lack of informed consent, invasion of privacy, and whether deception is involved (Bryman, 2008; Saunders *et al.,* 2009; Flick, 2009).

Harm can entail a number of aspects, including physical and mental harm, and so researchers should be aware of the likely experiences and consequences that taking part in the research will have for the participant. In addition, the researcher must ensure that the participant is fully informed of all that is required of them so that they can make an informed judgment as to whether they will be negatively affected by participating in the study.

When it comes to the issue of *consent*, participants were given as much information as possible in order to make an informed decision about whether or not to take part in an initial contact; all participants willing and able to be interviewed made the effort to be present in the second contact phase for the actual interview. During the secondary contact phase, the researcher went through the interview protocol: The researcher made clear what the research is about, that they were using a recording device, why it is being undertaken and in what context the results of the research will be used in, including anonymity of participants, use of a password-protected database to hold the information (see appendix 3) after their consent was given, interview were conducted.

The researcher needs to be aware that, even if a participant agrees to participate in the interview process, they may feel certain questions invade their *privacy* and may become uncomfortable about this. This is relevant to issues of anonymity and confidentiality when it comes to personal and sensitive information. In addition, it was ensured that interviewees were not under the impression that response to all questions was compulsory, although probing was used to encourage answers.

Researchers should not *deceive* participants about what their work actually is about; but they also want the participant to respond naturally to questions rather than having their answers influenced by the purpose of the study.

It was ensured that all of these issues were avoided in this study by developing a protocol (see Appendix 4) that standardised what all interviewees were told before the interview, and guaranteed that all interviewees were equally informed, not deceived, aware of the anonymity and confidentiality of their responses, that they were not being forced to answer questions, and they would not be harmed during, after, or as a result of, the study.

Another general ethical area to bear in mind, mentioned by Saunders *et al.,* (2009, p. 194), is the 'maintenance of the researcher's objectivity' during the data collection stage, which means that the researcher should collect data accurately and fully, and avoid subjective selectivity. As mentioned previously, recording interviews, and having them transcribed by an independent third party guaranteed this.

5.3.2.8 Step 8: Analysis and findings of the data

The methods of analysis used in this study are described above in step 6; these methods were followed, and so no further explanation is needed for the actual methods. However, in order to reduce the time taken on the analysis stage, the computer-assisted qualitative data analysis software (CAQDAS) tool, NVivo, was used; NVivo is explained and justified below.

NVivo and Coding

Due to the large volume of data collected in this study, it was perceived that a CAQDAS tool would be highly beneficial, as it would reduce the time taken to analyse the data. Lewins and Silver (2006) point to a number of benefits of CAQDAS, such as enabling work to be structured and organised, ease of access, ease of data exploration through key words and phrases, flexible coding, helps build hypotheses and theorise, enables the researcher to record their thoughts linked to the data, and allows the user to view the generated output of the software programs on other applications, such as in tabular reports or spreadsheets. In addition, Silverman (2005, p.189) mentions four advantages of CAQDAS, which are speed of handling large amounts of data through a number of analytic questions, improves rigour through counting phenomena and by looking for deviant cases, enables consistent coding,

and helps with sampling decision-making in terms of representativeness or through theory development.

NVivo was chosen as it provided a platform from which to transfer documents directly from any source, and allowed the researcher to codify the data and attribute stakeholder source to the data. NVivo essentially refers to codes/themes as 'nodes' which help the researcher have a better understanding of concepts and the case under investigation. Nodes can be linked to other nodes and can be put into a hierarchy. The transparency of NVivo also allowed the researcher to identify the nodes (codes/themes/determinants) that had been used, and make links with relevant text. All stakeholder documents used and all interview transcripts were manually inputted into NVivo. In order to familiarise himself with NVivo, the researcher undertook tuition sessions in order to ensure that he was using the software correctly. Please see figure 5.3 below for the process followed when using NVivo.

FIGURE 5.3: The process followed when using NVivo (Source: QSR International, 2012).

NVivo was used as a tool to aid stages one, two and three of the grounded theory approach to coding and analysis which comprises (1) Open Coding (KWIC), (2) Axial Coding through construction of a conditional relationship guide and (3) Selective Coding.

NVivo enabled document data to be imported into the software program; KWIC analysis then identified themes and sub-themes (nodes or sub-nodes) in the documents. Following this, interview data were imported and additional themes were identified through KWIC relevant to environmental issues in the Maldives as shown in Appendix 2. The open coding process also fulfilled **research objective one**: To undertake an analysis of policy and institutional documents (chosen due to their congruence with the key themes identified in the literature review), produced by the Maldives government and by organisations with a presence or role in the Maldives, in order to identify the key environmentally-related themes and issues. It also fulfilled **research objective two**: to use the identified key themes and issues to construct interview questions that aim to reveal stakeholder perceptions, knowledge, values and responses to these key issues. Use these interview questions to interview key stakeholders.

KWIC was used because the main issues highlighted by stakeholders in their documents were, in effect, self-identified and thus self-evident as themes important to the case study. The KWIC enabled themes identified to be employed in the interview discussion topics to understand issues in more depth, but also to understand the differing perceptions of these and establish what affected stakeholders' response to environmental issues in each thematic area.

During the KWIC process, word searches were conducted that extracted the most repeated terms used throughout each document (28 government documents, 18 international organisation documents, 11 third/voluntary sector documents, and 22 private sector documents). The locations of the identified terms were then found and the context in which it was mentioned was copied into the corresponding tables (see Appendix 2).

NVivo enabled the researcher to identify the broad topic areas and sub-themes by dividing the data into nodes and sub-nodes. The broad topic areas were: *Climate Change, Disaster Risk, Waste Management, Adaptation and Mitigation,* and *Capacity/Resource Issues*. Data were catalogued into the various broad topic areas and sub-themes. NVivo was used to classify the data to help identify who was saying what. Please see table 5.7 below for the main themes and sub-themes along with the relevant codes.

TABLE 5.7: The Dominant Themes that Relate to the Environment And Their Relevant Codes Found in KWIC Analysis

Themes	Code
Climate Change	CC
Disaster Risk	DR
Waste Management	WM
Capacity Issues	CI
Adaptation and Mitigation	AM

TABLE 5.7.1: Sub-themes Relating to Climate Change and their Relevant Codes:

Climate Change (Sub-themes)	Code
Adaptation and Mitigation	AM
Sea Level Rise	SLR
Coral Bleaching	CB
Erosion	ER
Extreme Weather Events	EW
Water Resources	WR
Energy	EN
Coastal Zone Management	CZM
Nature and Biodiversity conservation	NBC
Awareness/Education	AW/ED
Financial Issues	FNI
Technology	TN
Communication/Network of Interaction	CM/NT
Human Resources	HR
Institutional Structure	IS
Country Characteristics	CR
Remoteness	RM
Fragility	FG
Vulnerability	VN
Topography	TP
Economy	E
Political Structure	PS

TABLE 5.7.2: Sub-themes Relating to Adaptation and Mitigation of Climate Change and their Relevant Codes:

Adaptation and Mitigation (Sub-themes)	Code
Sea Level Rise	SLR
Coral Bleaching	CB
Erosion	ER
Extreme Weather Events	EW
Water Resources	WR
Energy	EN

Adaptation and Mitigation (Sub-themes)	Code
Coastal Zone Management	CZM
Nature and Biodiversity conservation	NBC
Financial Issues	FNI
Technology	TN
Communication/Network of Interaction	CM/NT
Human Resources	HR
Institutional Structure	IS
Country Characteristics	CR
Remoteness	RM
Fragility	FG
Vulnerability	VN
Topography	TP
Economy	E
Political Structure	PS

TABLE 5.7.3: Sub-themes Relating to Disaster Risk and their Relevant Codes:

Disaster Risk (Sub-themes)	Code
Adaptation and Mitigation	AM
Awareness/Education	AW/ED
Financial Issues	FNI
Technology	TN
Communication/Network of Interaction	CM/NT
Human Resources	HR
Institutional Structure	IS

TABLE 5.7.4 Sub-themes Relating to Adaptation and Mitigation of Disaster Risk and their Relevant Codes:

Adaptation and Mitigation (Sub-themes)	Code
Tsunami	TS
Flooding	FL
Storm Surges	SS
Water Resources	WR
Coastal Zone Management	CZM
Stakeholder Motivation	SM
Awareness/Education	AW/ED
Financial Issues	FNI
Technology	TN
Communication/Network of Interaction	CM/NT
Human Resources	HR
Institutional Structure	IS

TABLE 5.7.5: Sub-themes Relating to Waste Management and their Relevant Codes:

Waste Management (Sub-themes)	Code
Pollution	PL
Sanitation	SN
Environmental Management	EM
Awareness/Education	AW/ED
Financial Issues	FNI
Technology	TN
Communication/Network of Interaction	CM/NT
Human Resources	HR
Institutional Structure	IS
Country Characteristics	CR
Remoteness	RM
Fragility	FG
Vulnerability	VN
Topography	TP
Economy	E

TABLE: 5.7.6: Sub-themes Relating to Capacity/Resource Issues and their Relevant Codes:

Capacity Issues (Sub-themes)	Code
Awareness/Education	AW/ED
Financial Issues	FNI
Technology	TN
Communication/Network of Interaction	CM/NT
Human Resources	HR
Institutional Structure	IS
Country Characteristics	CR

These key themes and sub-themes were then used to determine the topics covered in the semi-structured interviews. The data from the interviews was imported into NVivo and inputted into the existing nodes, following which new nodes were set up for the new themes that emerged from the interviews. This enabled the researcher to collect data about all that was said about a certain category, such as, climate change, disaster risk and waste management alongside the attribute of the stakeholder; for example, the sector. The nodes were then explored, and further split up into sub-nodes; and these were then further coded. The data were then queried, and relationships identified between themes.

The interview data reiterated the themes and sub-themes of the KWIC, but it additionally brought up the following frequently occurring new themes in relation to climate change, disaster risk, waste management and capacity issues; see table 5.8.

TABLE 5.8: Additional Themes from the Interview Data

Theme	Code
Stakeholder Motivation	SM
Political Corruption	PC
Lack of Accountability and Transparency	LAT

During the axial coding phase, NVivo enabled the author to conduct queries to address a wide range of questions about patterns in the data, and to gain access to the content that shows those patterns. This helped in the construction of a conditional relationship guide by identifying the relationships and interactions of the determinant categories (top-level codes) with the others in relation to each stakeholder group, to ascertain which determinant was the most dominant and occurred most frequently when it came to influencing stakeholders' ability to respond to environmental issues. These top-level determinants (frequently occurring) - *Stakeholder Motivation; Awareness/Education; Finance/Costs; Technology; Communication/Network of Interaction; Human Resources; Institutional structure,* and *Political Corruption* - were summarised in turn in the conditional relationship guide tables (see appendix 6 for table summary). The table acted as a foundation on which to base the discussion of the findings of the conditional relationship guide which can be found in chapter 6.

Motivation was identified as the key determinant that has a high frequency of mention, and is found to be connected to many of the other determinants. NVivo was employed to further conduct queries around the highest-level node of Government Motivation and how 'lesser' determinants are connected to the key determinant until patterns and repeated relationships emerged from the data. A model was developed to illustrate the relationship of the key determinant of government motivation to responding to environmental issues in the Maldives: please see chapter seven for the **Key Determinant Model**.

This process helped fulfil **research objective three**: to analyse policy and institutional documents and interview responses, in order to examine what central factor(s) affects the stakeholders' ability to respond to environmental issues in the Maldives.

Issues facing data analysis

Interpretation of qualitative data into codes is often based on one person's – the researcher's – understanding, knowledge and viewpoints; therefore, there is potential here for the analysis to suffer from bias. To avoid this problem, small portions of the data were shared with peers to gain their perspective on the meaning of these passages, and to ensure that these are consistent with the researcher's understandings; this served as a reality check on the researcher's interpretations, created added awareness of dimensions in the data, and encouraged fresh ideas, with additional queries to follow up on.

Even in studies where codes have been appropriately developed, Bazeley (2009, p.10) argues that there is frequently an issue with the naming of broader themes, as presented themes are often just labels for a more inclusive category, or are just classifications of codes into types of categories, and they lack explanation, comparative examinations, and/or discussion. Description is of course part of the "analytic journey"; however, description alone is insufficient - to obtain the full value of the data, and generate the most valuable conclusions, the data must "be challenged, extended, supported, and linked" (Bazeley, 2009, p.11).

A related problem is that analysis is often reported in a shallow manner, where themes are presented using only a brief summary with a single quote to indicate 'evidence' for each theme. This limits the ability of the reporting to convey how widely extensive a theme may be, who it may apply to, or how themes are linked. Themes only gain full significance when,

> "They are linked to form a coordinated picture or explanatory model"(Bazeley 2009, p.12.)

 It is hoped that as grounded theory was used in this study, the full significance of the themes – alone and collectively – and the relationships among them have been conveyed effectively and that the resulting conclusions are of significant value.

5.4 CHAPTER SUMMARY AND CONCLUSION

The research methods in this study were influenced by the aim and research objectives mentioned earlier, and the author's assumptions of reality. The ontological, epistemological, and theoretical foundations of the research adopted a subjectivist/constructionist approach by finding an interpretivist paradigm most suitable; the form of interpretivist approach to human inquiry subscribed to in this study was phenomenology. The research demanded the disregarding of personal viewpoints about environmental issues in favour of collecting and analysing data in ways that identify, understand, describe and maintain the subjective nature of stakeholder responses. This feature of phenomenology is highly subjective, so this paradigm is associated with qualitative methods to data collection. The data-gathering method most suited to the study was semi-structured interviews. The research design followed the example set by the ProVention Consortium (2007) – who developed the 'seven-step' model – an eight-step model is subsequently generated that details the different steps that were involved in conducting this research, and the activities in each of these steps.

A case study approach enabled the researcher to explore particularity and complexity of a single case, by reaching an understanding of its activity within important circumstances and to catch the complexity of the multiple experiences of a wide range of stakeholders to environmental issues in the tourism-dependent Maldives. Collecting data from both stakeholder documents and stakeholder interviews ensured that the analysis and conclusions were as well-informed and all-encompassing as possible. The KWIC enabled themes that were used for interview discussion topics not only to understand these issues in more depth, but also to understand the differing perceptions of these and establish stakeholders' actual activities within each thematic area. The grounded theory approach to coding data enabled themes found to be linked to an explanatory model which helped to convey relationships between themes effectively.

CHAPTER 6: THEMES AND RELATIONSHIPS

6.1 INTRODUCTION

This chapter fulfils step eight of the PVC outlined in chapter six by analysing and reporting the findings of the data. Furthermore, data from the three steps in the grounded theory approach to coding and analysis will be examined in this chapter by discussing the themes and relationships that were found.

This chapter first identifies and reports in a quantitative format the dominant themes and highlights interesting issues that were revealed in the analysed stakeholder documents related to those themes. KWIC analysis of the documents identified six dominant broad topic areas - *Environment; Climate Change, Disaster Risk, Adaptation and Mitigation, Waste Management and Capacity/Resource Issues* - as well as sub-themes; furthermore these were used to structure the interview questions.

Second, the chapter reports the findings of an in-depth analysis of the combined data from documents produced by stakeholders outlined in the paragraph above as well as interview data from government, international organisations, private sector, third/voluntary sector and local community. The discussion explains how the determinants affect stakeholders' response to environmental issues, and essentially identifies the relationships and interactions of the eight top-level determinants (frequently occurring) that influenced stakeholders' response to environmental issues: these were *Stakeholder Motivation; Awareness/Education; Finance/Costs; Technology; Communication/Network of Interaction; Human Resources; Institutional structure;* and *Political Corruption* with the other determinants.

Third, the discussion moves forward to explain the key determinant which occurred most frequently when it came to influencing stakeholders' response to environmental issues, namely Government Motivation. The purpose of this section is to identify and clarify the key determinant from the discussion about how the determinants affect stakeholders' response to environmental issues. Furthermore, it clarifies what the significant 'environmental issues' are in the Maldives as shown in the data. However it is left to chapter eight to further explain and report the links between Government Motivation with other determinants through the key determinant model.

6.2 RESULTS OF DOCUMENTS ANALYSIS

This section reveals the results of the KWIC analysis of stakeholders' documents. The key words searches pulled out the most repeated or dominant themes which were *Environment, Climate Change, Disaster Risk, Waste Management, Adaptation and Mitigation and Capacity/Resource Issues.* These are each reported in table 6.1 below, to reveal the frequency of mention of themes by each stakeholder group; namely, government, international organisations, private sector and third sector and identifies any interesting issues.

TABLE 6.1: Dominant Themes

	Government		International		Private Sector		Third/Voluntary	
	N^o Docs examined	N^o times mentioned	N^o Docs examined	N^o times mentioned	N^o Docs examined	N^o times mentioned	N^o Docs examined	N^o times mentioned
Environment	24	649	16	303	17	218	11	104
Climate Change	21	986	16	312	9	115	9	92
Adaptation & Mitigation	19	410	9	182	10	171	6	42
Disaster Risk	14	256	13	273	9	25	7	83
Waste Management	17	417	13	232	11	203	9	110
Capacity/Resource Issues	21	1208	15	623	12	70	10	48

6.2.1 Environment

Environment was mentioned by all stakeholder groups and the third/voluntary sector mentioned it in all their documents that were examined. The government and international organisations have both produced a significant amount of documents regarding the environment. Similarly the private sector also mentioned the theme in most of their documents since it is regarded as what tourists find aesthetically pleasing so it makes economic sense to mention its value. All stakeholders revealed their high regard for

environmental protection but there were a number of issues related to the environment that was frequently mentioned these were: climate change; adaptation and mitigation; disaster risk; waste management; capacity/resource issues.

6.2.2 Climate Change

Climate Change was mentioned by a significant number of government, international organisations and third/voluntary sector documents, the government especially made a lot of reference to it mentioning it 986 times. This signifies the high level priority it is given within policy documents and in government discourse and the reason why significant resources and spending has been promised to tackle climate change. However only 9 out of the 22 private sector documents made reference to climate change and this could be because they did not want to damage or take away the image tourists have of the Maldives, those private sector documents that did mention it was often made in relation to the marine environment in the context of coral bleaching and the impact on marine life.

6.2.3 Adaptation and Mitigation

Adaptation and mitigation was mentioned by all stakeholder groups, although it was not mentioned in all documents by any stakeholder group it was deemed significant because it was seen as a tool to tackle environmental issues such as climate change and disaster risk. It was mostly mentioned by the government and international organisations and this could be due to the influence of scientific reports, experts' opinion and policy makers deeming adaptation and mitigation as the way to tackling issues such as climate change. Examples of adaptation mentioned by stakeholders includes hard or soft engineering to reduce the impact of storm surges and the aim of the government to mitigate the effects of climate change by reducing national carbon emissions.

6.2.4 Disaster Risk

Disaster risk was mentioned by all stakeholder groups but most references was made by government and international organisations since they were involved in developing policy and setting up projects to tackle disaster risk issues. The third/voluntary sector did mention it but it was mostly in relation to the effects of a natural disaster such as the 2004 tsunami on the local community. The private sector made limited reference to it and most resorts

did not even mention it in their documents, this could be because they did not want to provide negative advertising which could ultimately impact their product and their sales.

6.2.5 Waste Management

Waste management was mentioned by all stakeholders but not in all of their documents and this is because the purpose and content of some of the documents were not related to waste management. However from the documents that did make reference to it, the frequency of mention was very high in all sectors. Resorts did not mention it directly as a problem as they did not want to show the negative side to their potential customers but at the same time they acknowledged the importance of taking responsibilities about these kinds of issues. Private sector businesses involved in environmental assessments identified it as a significant problem that needed tackling. The third/voluntary sector highlighted the projects they were involved in with the local community, for example raising awareness and education and setting up waste management sites. Government and international organisations have made reference to the problem over several years and the government have produced policy documents in relation to dealing with the problem.

6.2.6 Capacity/Resource Issues

Capacity/Resource issues were mentioned with very high frequency in government and international documents; this was because, the study examined documents related to the limits and barriers affecting stakeholders' response to environmental issues. Furthermore the government and international organisations have developed a number of documents over the years related to Maldives capacity issues and therefore studies undertaken by consultants on behalf of the government and international organisations will be included in these documents. The capacity/resource issues were acknowledged by the third/voluntary sector and they made reference to the way they tried to tackle the capacity problems for example through education and awareness programmes, similarly resorts reported their actions to improve the capacity of the local community.

These broad themes were used to structure the interviews. It is important to note that the findings from the interview data were examined alongside the broad topics and sub-themes found in the documents as outlined in chapter 5 (section on NVivo and coding) and

mentioned in the discussion above. Despite significant overlapping of themes and sub-themes of the interview data with that of the documents, three dominant new themes were identified, also outlined in chapter 5 in table 5.8; these were *Political Corruption*, *Stakeholder Motivation*, and *Lack of transparency and Accountability*. It is important to note that themes/variables will be described as 'determinants' (concepts of interest) from this point onwards to give more consistency to the discussion. With further analysis of the data (documents and interviews) eight top-level determinants surfaced in the data which required further analysis: these were *Stakeholder Motivation; Awareness/Education; Financial Issues; Technology; Communication/Network of Interaction; Human Resources; Institutional structure,* and *Political Corruption.* The next section discusses and explains how the top-level determinants found in the data from both documents and interviews interact with other determinants, to ascertain how the determinants affect stakeholders' ability to respond to environmental issues.

6.3 RESULTS OF THE ANALYSIS OF COMBINED DATA FROM DOCUMENTS AND INTERVIEWS

6.3.1 How the Determinants Affect Stakeholders' Ability to Respond to Environmental Issues in the Maldives

The eight determinants identified form the subject of the discussion: these are *Stakeholder Motivation; Awareness/Education; Finance/Costs; Technology; Communication/Network of Interaction; Human Resources; Institutional structure,* and *Political Corruption*. These are examined to get a better understanding of what affects stakeholders' response to environmental issues. The perspectives and evidence from the following stakeholder groups - government, international organisations, private sector, third/voluntary organisations, and local community - are featured, supported with data from documents and interviews. This section discusses the events or variables that lead to the occurrence or development of the determinant, context-specific issues, issues that arise that influence or affect the determinant, action strategies meaning goal-oriented activities that stakeholders perform in response to the determinant, and consequences (intended and unintended), with evidence from documents and interviews. (Please see appendix 6 for tables summarising the conditional relationship guide on which the discussion below is based.)

6.3.1.1 Stakeholder Motivation

Stakeholder motivation resulted as a top-level determinant in the data and was regarded as affecting stakeholders' response to environmental issues; furthermore government motivation is deemed to be a significant causal factor of stakeholder motivation as evidenced in this section as well as in sections related to other determinants. The motivation of government, international organisations, private sector, third/voluntary sector and local community is inspected through evidence from documents and interview data, in terms of what influences it, how it influences stakeholder actions, what actions or strategies are undertaken and the consequences due to motivation or lack thereof.

Government

Government has revealed some areas of concern regarding the environment; for example, the First National Communication of the Republic of Maldives to the United Nations Framework Convention on Climate Change (2001) declared climate change and associated sea level rise as a primary concern of the Maldives. Consequently, the Maldives has continued to participate in the international forum, calling attention to the fragile nature and special vulnerability of small islands. Environmental conditions in the Maldives were perceived to influence motivation; for example the National Adaptation Programme of Action (2007, n.p.) identified that Climate Change had an impact in the Maldives in a number of different ways such as increased beach erosion, coral degradation, salt water intrusion affecting vegetation on islands which would affect food security and agriculture, fishing affected by reduced availability of live bait fish and reduced tuna catch yields, and water resources affected by changes in precipitation and salinisation of water resources. Furthermore, a primary non-climate change-related environmental concern was revealed to be solid and hazardous waste management as one of the greatest environmental challenges in the Maldives. The worsening waste management situation is attributed, but not necessarily limited to rapid population growth unevenly distributed between islands, changing consumption patterns, limited land area, and wide distribution of the islands (Maldives National Assessment Report, 2010). The Strategic Action Plan National Framework for Development 2009-2013 (2009, n.p) mentions that the Constitution of the Maldives ratified in August 2008 for the first time states protection of the environment as a fundamental right of the people. Furthermore it is to ensure the provision of the

fundamental services provided by the environment; the right to access to safe drinking water, safe disposal of solid waste and access to electricity. Ten key sector policies include:

(1) Strengthen EIA (Environment Impact Assessment) with an emphasis on monitoring

(2) Conserve and sustainably use biological diversity and ensure maximum eco-system benefits

(3)Develop resilient communities addressing impacts of climate change, disaster mitigation and coastal protection

(4) Strengthen adaptation and mitigation responses for beach erosion and develop a system to assist communities where livelihood and property are affected by beach erosion

(5) Ensure management of solid waste to prevent impact on human health and environment through approaches that are economically viable and locally appropriate

(6) Ensure protection of people and environment from hazardous waste and chemicals

(7) Improve air quality to safeguard human health

(8) Enable a fully functional decentralised environmental governance system

(9) Develop a low carbon economy to achieve carbon neutrality by 2020

(10) Inculcate environmental values in society and enable an environmentally friendly lifestyle.

However, interviews exposed Government's motivation to act on environmental issues not only to be influenced by the climate and non-climate-related environmental issues; the political agenda of the ruling government and political actors' personal viewpoints on certain environmental issues and their associated risks were also discovered as influencing factors. Government department representatives differed on their viewpoints when it came to perception of Climate Change issues, specifically sea level rise. As a government representative (25-40/Male) mentioned,

> "It depends on the individual's personal understanding, awareness and knowledge if they want to do something about Climate Change; some perceive sea level rise as

something to be worried about; others view environmental talk as a PR exercise and others are more concerned with developmental issues than environmental ones".

Another government representative (40-55/Male) revealed,

"There are more concerning issues than sea level rise related to the environment that need to solved, such as waste problems and dealing with storm surges, flooding and a lack of drinking water, this preoccupation with Maldives being submerged in 30 years is scaremongering and has brushed off the real issues we need to deal with".

It was discovered that political events affected government action; for example, a respondent from the private sector (25-40/Male) declared,

"The political struggles of the government have taken up the energy and resources of the government, they want to stay in power and so they will do so at any cost".

Another respondent from a local community group (40-55/Male) stated,

"There is a culture among the political classes to control resources, they find ways of skimming off the funds available for development programmes so there isn't much left".

A number of respondents from the private sector, third/voluntary sector and local community revealed that corruption played a role in affecting government motivation, and the lack of transparency in government departments exacerbated the problem. One respondent from the private sector (40-55/Male) declared,

"The widespread corruption in society has affected proper functioning of government, people in government seem to be looking to make a personal business deal when they are meant to be civil servants".

Moreover, public spending costs were pointed out by government representatives as a limiting factor for government motivation. One government representative (40-55/Male), declared,

"It is difficult for us to make decisions about where to spend money, because we have limited finances it is not cost effective to develop large scale infrastructure with islands with small populations, better if we have population consolidation, it would be more cost effective but everyone wants a school, sewerage system hospital and marina, even if the population of the island is 80".

Furthermore, a representative from the third/voluntary sector (25-40/Male) revealed that,

"Politics has taken up the resources of the country with the inflated wages and expenses of the political class, funds and financing are not there, people are preoccupied with politics".

Some respondents regarded the politicised culture influencing excessive government spending and therefore high fiscal deficits and significantly high national debt; which has resulted in, as one respondent in the government calls it, "a borrowing culture" to meet the annual budget spending requirements for political means, therefore there is little left over to be spent on key environmental issues. A representative of a private sector (40-55/Male) organisation stated,

> "The government are getting a significant amount of tax revenue from the tourism industry but still they are spending a lot of it, however not on development or reducing national debt but on wages and expenses of its employees and members of parliament, government spending keeps going up".

The influence of other stakeholders on the government was identified by an international organisation representative (25-40/Female) revealed,

> "We lobby government with our development agenda sometimes in line with government plans and sometimes not, this has motivated government to act because we are willing to fund environmental projects, however it does not mean it will be fully implemented by the government".

The National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) revealed that weak management and inadequate human resources limit organisational effectiveness; lack of transparency and accountability is also a concern; financial resource allocations at all levels are inadequate; access to and delivery of critical and timely information for decision making and public awareness is seriously limiting; and there is a lack of monitoring and observation for the systematic collection of data and analyses for reporting purposes. However, the government have shown to lack the motivation to effectively respond to climate change issues by not addressing the points raised above. Furthermore, the National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) revealed that effective responses to Climate Change and related issues have not been implemented by the Maldives because of the structure of government agencies (often fragmented and with a lack of coordination) and the small Maldivian administration cannot handle many international and donor agencies and the ways they operate, resulting in an extended time frame which to develop and gain endorsement of a project. There was the recognition from most interview participants that politics and the structure of government departments with continuous changes of

leadership and responsibilities had an impact on the government getting things done. International organisations felt they were constrained by the lack of government motivation and willingness to develop capacity to implement projects.

The Government has come up with various action strategies to deal with their environmental concerns. The Strategic Action Plan National Framework for Development 2009-2013 (2009) identifies that the Maldives is among the most vulnerable and least defensible countries to the projected impacts of climate change and associated sea level rise. Adaptation to climate change and disaster risk mitigation and management is stated as a priority of the government and is being mainstreamed into policy making and programming in all areas. This includes manoeuvring the Maldives as a central player on climate change globally, addressing GHG emissions, and achieving carbon neutrality by 2020. Furthermore, the government stated their intention to develop Island Waste Management Centres on all inhabited islands and to ensure that the Centres are equipped to enable the island communities to manage the waste. Further intentions are to develop and construct Provincial Solid waste Management Facilities with particular emphasis on recovery and recycling, and to enable establishment of waste collection and transfer services in the Provinces.

Government motivation or lack thereof has resulted in and influenced a number of issues. Firstly it was identified by respondents from the private sector, third/voluntary and local community that in the area of waste management, there was insufficient funding in the waste management sector, particularly in local communities far away from Male', the deficiency of investment outside of Male'; as one third/voluntary sector representative (25-40/Female) declared,

> "Due to the lack of cost recovery mechanisms of waste management in atolls, little has been done, but the government could still set up central waste facilities in the north and south".

A respondent from the local community (25-40/Male) stated,

> "There is no leadership and initiative taken by the government to co-ordinate a solution".

A private sector representative (25-40/Male) revealed,

> "The World Bank project tried to get the resorts near Baa atoll to pay for a waste collection site but it was not feasible in terms of the amount of rubbish that would be taken and nothing came of it".

A government representative (25-40/Male) stated,

> "The government had the opportunity to develop Thilafushi in the past 15 years, I mean properly and make it into a place where they incinerate waste - instead they just dump it there. There is talk of an Indian company winning a bid to develop Thilafushi into a facility that produces biogas but I have heard there is some issue over corruption over the deal, so don't know if it will go forward".

Regarding disaster risk reduction, there was a general feeling among respondents that it was difficult to prepare the country for something like a tsunami; although the Maldives now had access to the Indian ocean early warning/alert systems, some local islands and resorts were more organised than others and it was discovered that some received better information than others when there were alerts. However, the third/voluntary sector respondent (25-40/Male) sensed the disaster risk reduction has not been properly addressed in the Maldives; he revealed that,

> "The main barrier to implementing a disaster risk reduction project in the Maldives is the general lack of interest and motivation of the public towards hazards and climate change. Most people see these things as inevitable with little that they can do about it. Incorrect messages by the government such as that we will move to Australia when Maldives goes below sea level has given the public a false sense of security. Even though the Maldives was severely affected by the 2004 tsunami, most people still don't feel an urgency to plan for a similar disaster in the future. The government institutions that work in this area have also been slow in organising themselves. Frequent change of the heads of places like NDMC means that work is progressing very slowly. The Maldives needs to train disaster management professionals who can properly plan and implement disaster risk reduction and response programmes at a national level. The public needs to be informed of the hazards to their community and also that they can make a difference in the impact of these hazards by preparedness and mitigation activities".

Furthermore, a government representative (24-40/Female) stated,

> "The focus of the government has changed from natural development; people's minds are now geared towards political issues and with a new government the focus was on creating a resilience mechanism but this didn't accelerate so much. Although there is an institutional framework t there is no national platform for disaster management, work is fragmented - no holistic mechanism at this point".

The consequences of Government action/inaction to respond to climate change adaptation attracted a mixture of positive and negative remarks from stakeholders. A number of

respondents, from the government, private sector, third/voluntary sector and local community reported that flooding in some islands occurred as an annual event. Although some islands have benefited from infrastructure, comprising both hard and soft engineering measures to reduce the impact of wave erosion, there were reports of a lack of drainage facilities when islands were flooded. Water resources were also mentioned as something of a concern, where over 80 local islands require emergency water annually. In this vein a government representative (25-40/Male) stated,

> "It rains for 10 minutes stops and then happens again, there isn't the longer consistent rainfall there used to be before"

Another government representative (40-55/Male) reported,

> "The Maldives is in a difficult position right now because the logistics involved in supplying water to islands is a huge task and the costs of providing water is more expensive than actually the water itself. The transportation challenge is difficult. Every island needs to have a mechanism whereby they have access to water, whether by a central water hub located in each atoll in strategic locations. Currently we have a centralised system with three strategic areas in the country at present: Male', Lhaviyani and one in Southern atoll".

Furthermore a government representative (25-40/Female) revealed the lack of financial resources,

> "We don't get much from the local budget, we need donor agencies so it is therefore difficult to conduct programmes. Disaster management is a cross-cutting issue, not only the work of NDMC, at policy level every sector should have a component in policy and should be allocated a budget for it. At the vertical level, city councils, island councils have no budgetary allocation. Horizontally, different sectors such as tourism have no budgeting policy for making communities safer in terms of natural hazards".

Furthermore, the representative (25-40/Female) also outlined human resource issues,

> "We have a small population, work is done by a few people, a lot of multi-tasking is done in the Maldives".

Respondents from the local community and third/voluntary sector felt that government was not motivated to train people in the local community to do certain skilled tasks; often local communities are dependent on central government sending people to fix problems at very high costs and often having to wait for long periods of time to get things done.

The lack of population consolidation has resulted in government resources for climate change adaptation being stretched, as one government representative (40-55/Male) stated,

> "I don't see how we can help islands adapt properly without creating larger more populated islands, it is too costly to provide all this infrastructure to so many islands".

However, having previously been that of population consolidation after the tsunami, the government's policy has now changed, as the First National Communication of the Republic of Maldives to the United Nations Framework Convention on Climate Change (2001) mentions that Population consolidation may be considered as another adaptive strategy for the Maldives. It is even mentioned in the National Progress Report on the implementation of the Hyogo Framework for Action 2009-2011 (2011). Population consolidation and the creation of safer islands are part of the solution to climate change, as discussed in the 7th National Development Plan. However, as one government representative stated (25-40/Male),

> "The government since 2009 have decided not to push for population consolidation and put it on hold as there are social problems associated with it".

Most government respondents perceived population consolidation as causing social problems and being politically unfavourable, which could result in reduced political support from the local community.

International Organisations

International organisations' motivation seemed to be influenced by their organisational agenda; for example, a representative of an international organisation (25-40/Female) revealed,

> "Our policy is that we wouldn't do any lending that impacted negatively on the environment so an EIA is undertaken before funding. We are promoting green technologies".

Respondents from international organisations acknowledged that they viewed the Maldives as vulnerable to climate change; as another representative of an international organisation (25-40/Male) noted,

> "I think that the biggest asset that the Maldives has and is potentially losing at the moment is the coral reefs as its natural buffer to sea level rise and to erosion. I think I mentioned the coral reef accretion has to happen at a faster rate than sea level rise and at the moment it's clearly not the case. Not only is coral reef accretion slower but also the reefs themselves are being damaged because of coral bleaching and ocean acidification so that's decreasing the integrity and the mechanical strength of corals which basically reduces the overall integrity and the strength of the region".

Organisations such as the ADB, UNDP and IUCN recognised the unique environment the Maldives has and all of them mentioned that they were involved in tackling environmental issues. The UNDP Cost Benefit Study of Disaster Risk Mitigation Measures in 3 Islands in the Maldives (2009) emphasised UNDP's commitment to supporting the Government of the Maldives in operationalising the outcomes of COP 15 to the UNFCCC, by mainstreaming climate change adaptation and low carbon development in the national Strategic Action Plan. It also outlined its role in climate change adaptation and disaster risk reduction (DRR) at the island, atoll and national level. International organisations indicated that they were motivated by their agenda, expert opinion and literature; they also showed an interest in providing policy recommendations, advocacy and strengthening capacities in the Maldives. However, some international organisations' representatives made it clear that the behaviour or lack of motivation of the government to adhere to the funding conditions did affect their motivation to provide future funding for projects. ADB OECD Validation of the Country Strategy Program Completion Report (2007) recognised that implementation of the programmes was affected by weak institutional and human capacity in government departments. The UNDP Cost Benefit Study of Disaster Risk Mitigation Measures in 3 Islands in the Maldives (2009) highlights institutional challenges at the national level in the Maldives: lack of finance; weak management; weak monitoring and observation; lack of access to timely information; overlapping mandates and responsibilities of ministries.

International organisations such as the ADB and the UNDP have aligned a number of their development agendas on similar lines to the Maldivian government agenda on climate change adaptation and environmental management. As the ADB Maldives Environment-Assessment (2007) outlines, development partners such as the UNDP provide support to the Maldives in solid waste management, promoting renewable energy, atoll ecosystem conservation, and climate change adaptive measures. The UNDP takes the lead in institutional and specialist technical support in these areas, complementing the more project-based mainstreaming approach of ADB and other development partners. Despite the technical support given by international organisations, the UNDP Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009, n.p.) acknowledged the following: that the Maldives government have not fully dealt with the mismatch between national and local level risk reduction priorities; that disaster risk reduction implementation

is at the mercy of the government acknowledging and being willing to develop institutional capacity; that methods to mitigate losses and improve resilience is a high level priority at local levels but they have not being given the capacity to act; a lack of government participation with local community regarding land use planning and land reclamation as part of the Safe Island Programme; government have not collected sufficient climate risk data over the long term to help planning; a lack of a culture of allowing the participation of the local community; government need to enhance risk awareness in the local community and in schools; and that government have not enforced environmental management systems on human activities and have just concentrated on physical mitigation. The ADB Maldives Environment-Assessment (2007) highlights that ADB's central focus was on regional development through the provision of essential infrastructure; with an emphasis on community participation, such as water supply sanitation and solid waste management. However the ADB OECD Validation of the Country Strategy Program Completion Report (2007) revealed that implementation of the programmes was affected by weak institutional and human capacity. Furthermore, -project-implementation problems and delays led to a general perception that ADB-funded projects are often delayed. Moreover, government ministries implementing the sub-projects do not have adequate and timely support from the Ministry of Finance and Treasury regarding disbursements and procurement. According to IUCN Valuing Bio-diversity, the economic case for biodiversity conservation in the Maldives (2009), the government have not developed the human resources of the local community; therefore there is no capacity at island or atoll level for monitoring and conservation activities and very little awareness. Furthermore, the IUCN report exposes that the Maldives is more interested in command and control measures of penalties and enforcement than in providing positive economic incentives and enabling economic instruments for biodiversity conservation. Moreover, regarding waste management, the UNDP Outcome Evaluation Country Programme Maldives 2003-2007 (2007) acknowledged that government monitoring and enforcement of waste management services has been weak. Although local island offices have the responsibility for waste management in their localities, they have received no formal training from central government, and are unclear regarding their rights to impose fines on offenders.

A representative of an international organisation (25-40/Male) revealed that the government has shown political commitment to mainstream adaptation but has been less motivated to mainstream disaster risk reduction, they stated,

> "Adaptation has been mainstreamed but DRR not that much because it's pretty evident as I said the Disaster Management Bill, it's been there since 2006, it's in draft form, it hasn't been completed, it hasn't been ratified, it hasn't been in the parliament but the Disaster Management Centre, it says the government has commitments, it's going to have the Bill done, ratified and all but since 2006 we haven't seen it. I think it's on adaptation, adaptation is more 'sexy' than the DRR, it's pretty clear when the president was talking about climate change in the world media, climate change adaptation resonated with the global media but DRR didn't".

Regarding waste management, another representative of an international organisation (40-55/Male) stated that it is currently a big issue, furthermore they revealed,

> "We did initial surveys. We went to the community and we asked them, 'What are your biggest concerns?' Was it related to the climate, related to poverty, governance and so forth and the number one issue was waste management. Yes we have waste management centres in the islands but what are those? They're just collection centres, we can't really get rid of waste, just pile it up. Once in a while like almost always, it washes away and goes in the reef, everybody's content with that because there's no other solution. If you look at the Greater Male' area we have an island set aside for waste but what about the rest? They don't have it. The resorts, yes they do, they have incinerators, they have bottle crushers, compactors and so forth and as I say we don't have recycling option in the Maldives. Metal we recycle, even plastic bottles, we are doing it right now but it's not institutionalised, we need to have proper measures; on islands you should have. My opinion is that you should have, let's say, compactors or an incinerator at least for an island. For the number of people you should have a set amount of incinerators so that they could actually get rid of a certain type of waste, if you could get rid of garbage, that's fish waste, rice and so forth. From what I've heard, the resorts - what they are doing is, they're dumping the waste into the reef or the deep sea because it's biodegradable but if you look at plastics and stuff, it needs to go away and you can't really throw it on the beach and expect it to go away but if it's incinerated the ash would be useful for fertilisation or something, so there is a way that you could do it. Right now it's just standing there; the waste is just sitting there piling up".

Private Sector

The private sector appeared to be motivated by government laws and regulations, and company policy, which differed among businesses. The managers' and owners' agendas showed it to influence the actions of the business. Businesses relationships with the political classes also affected their ability to get things done, as one resort representative (40-55/Male) reported,

> "We have good links to the various ministries, so they can be helpful in getting things passed when it comes to development projects"

Resorts in the Maldives acknowledged the importance of the environment to their business. A number of them in particular made reference to the coral reefs; for example, in documentation, the Banyan Tree Vabbinfaru Foreign (2012) revealed coral reefs were their primary focus due to the vital role reefs play in supporting the Maldivian Islands and communities. Furthermore, their marine research team explores the ways the reefs evolve. They outline the BioRock™ technology that is used to increase the growth rate and strength of corals. Reethi Beach Resort (2012) acknowledged that in current times everybody is sensitive to environmental issues, so a sympathetic approach to the sustainable management of holiday destinations has become obligatory. Some resorts have noted the marketing benefit of enlisting in industry-recognised programmes such as Travelife where hotels are subjected to a sustainability audit based on social and environmental criteria. The audit can lead to bronze, silver or gold awards which can be shown on the resort website. Another environmental certification programme is Earth Check; a resort representative (40-55/Male) that signed up their resort to this revealed,

> "We have to collect data for earth check; Wet and dry garbage weight, carbon emissions, energy consumption"

Most resorts that were interviewed felt that the Maldives was not vulnerable but rather resilient; therefore issues of sea level rise were seen as something unknown which generated negative publicity. Instead, they were more concerned with improving the aesthetics of the island due to erosion from seasonal sand shifts and waste being washed up on the shores. Finance and costs also motivated the agenda; if costs savings could be implemented, resorts would look to adopt practices if they were cost effective. For example, one resort engineer (25-40/Male) stated,

> "We have four generators, we have 33 areas that consume energy in the resort. We can monitor load consumption per day for each area, so we know what area consumes most energy per day. We have inverter controlled air condition units and so is the water plant, the booster pump system supplies water for the whole resort, speed of the pump is controlled by the demand and minimises energy usage".

Some resorts have been involved in raising awareness and providing funding for waste management and transportation on local islands, as one resort representative (18-25/Female) conveyed,

"The government are not doing anything to help waste management in the local islands in this area, so we have had to collect rubbish for the island nearby us and take it to the main rubbish island otherwise the rubbish gets washed up on our shores"

Respondents from resorts specifically recounted that the government did little to inspire and motivate them to act on reducing the carbon emissions or using renewable technology. As one respondent (40-55/Male) revealed,

"The government don't make it easier for us to invest in renewable or environmentally friendly technology, if there were subsidies or tax breaks for this kind of technology the uptake would be higher".

The three large international tour operators - TUI, Thomas Cook and Kuoni - all recognised their responsibility to manage environmental impacts issues: energy consumption, resource use; waste; aircraft emissions; biodiversity protection, and climate change impacts. The Thomas Cook Sustainability Report (2010) showed how all their actions to reduce environmental impacts across Thomas Cook Group are implemented under the umbrella of their Group Environmental Policy of which climate change is a priority topic. Kuoni Corporate Social Responsibility (2010) recognises environmental challenges for the tourism industry such as dealing with climate change impacts and preserving biodiversity. Furthermore, they acknowledge their business has an impact on the climate and they are taking responsibility by helping communities where tourism represents a major economic source to prepare for and adapt to the changing climate. This is evidenced in the Maldives through the collaboration between the IUCN, Seamarc and Kuoni, as the representative of an international organisation (25-40/Male) revealed,

"It just has to be studied enough and understood and this is part of world what we're trying to do here is focussing obviously on tropical marine life systems or coral reef systems"

as part of a programme to monitor and collect data and share experiences with local islands and resorts to gain knowledge and take action. However, tour operator representatives in the Maldives seemed to be less worried about Climate Change and sea level rise as indicated in the tour operator literature; as one representative (25-40/Female) revealed,

"There isn't really any environmental concerns here apart from waste and beach erosion, there's more concern with health and safety and there's a lot of legal claims and compensation unfortunately. That's the way the UK's gone and it was basically to ensure that all the properties that we work with have the minimum standards of health and safety and work in line with UK regulations as much as possible".

Another tour operator representative (40-55/Female) informed a changed in attitudes by stating,

> "I don't think the Maldives is vulnerable and the sea levels will rise; however I think resorts are becoming more aware and they know the mentality in the UK especially now, you know, everybody is concerned about the environment and sustainable tourism and we get a lot more clients now asking, so it is a good benefit for the islands to have featured in the brochures that they're part of Travel Life".

Both seaplane operators in the Maldives were influenced by managers' and owners' agendas, whether it was energy-saving equipment or infrastructure or, for example, the TMA 'The Flying Green Fund' which finances environmental projects of varying sizes across the country. Both representatives mentioned environmental issues, but what emerged as most concerning for them was waste in the country which was not being handled properly at the national level. Private sector consultancy firms who are involved in the EIA industry appeared to be motivated by their personal awareness and knowledge of the situation in the Maldives, as well as finance available and the conditions/criteria of their given project, as one representative (25-40/Male) acknowledged the Maldives faces, he revealed,

> "Short-term impacts of climate change not sea level, but impacts of other associated weather, rainfall and weather events, wind, storm and currents. We have to design and develop structures to deal with erosion on resorts".

Consultancy companies recognised that waste was the biggest present environmental problem for the country, but it was something they had little control over. It was seen as a governmental responsibility but they lobbied for changes. One consultancy representative (25-40/Male) purports,

> "We have an open economy - we can import whatever we want, we have a lot of plastics, hazardous wastes are generated on small islands. In the past 10 years a number of programmes have been installed, such as waste separation on resorts but at the end of day they take all this, it is all mixed up and taken to the rubbish island. We have done projects in local islands to help them sort their rubbish and help them compost".

Another EIA consultant (40-55/Male) revealed,

> "We perceive erosion in the Maldives as severe problem only when it affects property. I have examined erosion on islands from 1969 until the present day, islands that hadn't previously claimed erosion now have claimed severe erosion in the past five to six years with them perceiving it as due to climate change. If you look at the data that area has been quite volatile in those 40 years, it's just that they have moved there settlement into that zone and now they see the massive changes which becomes a problem for

them. I haven't seen that much change in the Maldives to warrant a direct link to sea level rise and climate change. I can't say for sure the changes in the last 40 years have been due to climate change and sea level rise".

Tourism trade associations showed that their actions to environmental issues were motivated by their board members and investment decisions, such as lobbying government for the interests of business owners. A representative of a tourism association (55-65/Male) conveyed,

> "We don't think EIAs are done professionally, but something that is done to fulfil rules and regulations. These things need to change, because these are very fragile systems we are living in, we can't move islands when conditions change, we are investing in 30 to 100 million dollars it is a financial asset and someway a liability to recover and protect. It has market value, brand, and customer loyalty. The strip of land around the island is worth a lot of money, it is tied to the reef and the rest of environment so it becomes an economic and environmental link which has to be looked after".

All three trade associations (MATI, MATATO, Live-Aboard Association) acknowledged that coral bleaching and sea level rise needed further research and is difficult to respond to; however, waste management was something that has lacked action, particularly at government level, and they felt that the government did not provide the infrastructure to make it viable. Trade associations regarded the disasters such as the tsunami as something which they are motivated to be prepared for in the resort and live-aboard industries. There was a consensus that political issues and the politicised culture in the country were becoming a limiting factor when it came to getting things done, and this had an effect on government motivation to doing things related to environmental issues.

Third/Voluntary Sector

The motivation of the third/voluntary sector appeared to be influenced by the agenda of the respective organisation. For example, Live and Learn (2012) purports that, following the devastating tsunami on 26 December 2004, the Asian Development Bank appointed Live and Learn to provide Technical Assistance (TA) to the Government of the Maldives for promoting Sound Environmental Management, and in 2006 it worked on a UNICEF-funded project to develop environmental education materials to support the existing environmental studies curriculum in schools. It provides both Environmental Education Specialists and technical assistance for projects: whereas Bluepeace (2012) revealed that it is made up of concerned individuals seeking to raise environmental awareness through campaigns and

activities. The organisation Mangroves for the Future (MFF) promotes healthy coastal ecosystems through projects in the local community. Most of this sector has shown to be influenced by literature and expert opinion on various environmental issues. Their perceptions of environmental issues impact their actions; for example, Live and Learn (2012) outline in their document that the Maldives has a narrow economic base that relies on two critical sectors: tourism and fisheries. Therefore, protecting the marine environment is crucial. Furthermore, they recognise that a long-term environmental education strategy is required to achieve widespread understanding of the interdependence and fragility of ecological systems. They perceive that environmental education can lead to the adoption of new behaviours in the protection of the natural resources, essential for human development in the islands. The MFF NSAP (n.d.) recognises that the Maldives is a coastal environment that is under pressure from development activities and vulnerable to the impact of climate change, and furthermore acknowledges that they will support government-associated policies as they relate to sustainable use and management of coastal ecosystems, and adaptation to climate change. Moreover, it promotes ecosystem-based integrated coastal management (ICM) focused on coral reef islands. Both respondents from Red Crescent Maldives and Live and Learn acknowledged that the Maldives is a vulnerable country due to it being a flat island coral archipelago. Furthermore, one third/voluntary sector representative (25-40/Male) stated,

> "Personally, I have experienced changes in the weather patterns that are unusual. For instance, the usual wet season in the June-July period has now shifted to either before or after. We have reports of more frequent flooding of the islands from wave swells in recent times. Heavy showers and strong winds with damage in many islands have been reported in recent times. Longer dry periods without rain have been a recent phenomenon in many of the northern islands, where they have to be served with freshwater for drinking purposes on an annual basis now".

All respondents agreed that waste management was a significant environmental problem, as another respondent from the sector (40-55/Male) revealed,

> "In my personal opinion, waste management is the number one environmental issue and it has not been adequately addressed prior to the tsunami of 2004. After the tsunami, a lot of islands got a so-called waste management centre that was only designed to collect waste, in different categories. However, these soon filled up in three months; it was not manageable because we have not considered a final disposal area or a site for outer islands just like Thilafush".

All respondents felt it was due to the lack of government financial assistance to develop the appropriate infrastructure. The issue of funding was seen as a motivator for action, although it was recognised that some NGOs received finance and support from the government due to political links and therefore those without those links relied on private donations or external agencies. Some respondents felt there was a lack of government support and drive to support the initiatives such as through human resources, finance, technology and a lack of communication. Respondents in the sector indicated a feeling that working with the government was at times bureaucratic and time consuming, and sometimes felt the government were not willing or motivated to take the initiative and get things done. All respondents felt more was needed to be done by the government to help train people, and to create awareness about environmental issues but felt the government were not willing to interact and have sufficient communication. As one respondent (25-40/Female) purports,

> "There is all this talk about carbon neutrality and helping the environment, it gets good PR for the government but on the ground the government don't seem to be speaking to us and the local community and solving the awareness, training, finance and technology needs".

Local Community

Local community respondents generally believed in global warming and the associated consequences of climate change but felt powerless to make a significant change because it was something that is affecting the whole world. When it came to motivation of individuals at island level to respond to environment issues, an atoll council representative (40-55/Male) mentioned,

> "People are doing more environmentally favourable practices, there are laws in place but people are doing it voluntarily. When people build their houses, they do not cut down trees unnecessarily. People now prefer to have the natural look and the feel while they build their houses. I don't think that they are necessarily being environmentally friendly due to a law. In the Maldives proper awareness is not practiced properly. It's always been forcing people to obey the law".

Another atoll council representative (25-40/Male) revealed

> "To tell the truth, not much is done. But people wouldn't cut down trees without permission. However, we cannot properly control people taking sand from the beach. The reason was that it's not easy to get sand and it's expensive as well. So people do it, they give something to these small crowds who are into drugs. They wouldn't mind doing it for them because they will be happy if they can buy drugs from it. I know this is not right. But it is not properly monitored yet".

Furthermore, another council representative (40-55/Male) explained what was done in relation to protecting the environment by stating,

> "Not much work is done. Only thing we are doing is we are having workshop to make people more aware about it. But nothing practical is been done. We can talk as much as we can, but if there is nothing practical done, I have to say the talk is useless"

A number of respondents acknowledged coral reefs were healthy around their atoll while others perceived reefs in their areas as damaged due to coral bleaching, which shows there have been differing levels of coral damage and recovery across the country. A number of council leaders suggested that people were more motivated by development than environmental responses, for example, as one atoll council representative (40-55/Male) revealed,

> "There is only one island in the atoll which has a proper sewerage system, which is XX. And work is started on a second island. Other islands are planned in the pipeline. After the sewerage system is built we are experiencing water in the islands getting saltier than on the islands which don't have the system".

Similarly another atoll council representative (40-55/Male) described,

> "The only island with a sewerage system is XX. It is important to have a proper sewerage system in all the islands. If we can have it, it will help prevent diseases. Before the sewerage system in my house, we had a tank to collect it. We have experienced the ground water becoming smelly and we couldn't find a solution for that. But after the sewerage system, now the ground water is good".

Most of the respondents identified that waste management was a problem, and acknowledged that they burned a significant amount of the rubbish which they could not recycle, compost or sell off as scrap metal.

Coastal erosion, high wave surges and tsunami risk were areas of concern for most atoll councils; as one representative (25-40/Male) described,

> "Before and after the tsunami in 2004, in the more recent tsunami alert there was a lack of communication from the authorities, we have an area of higher ground where people can go to".

Most respondents revealed the lack of finance available to implement basic development projects that people were concerned with, such as sewage systems and basic sanitation and a reliable supply of electricity as well as infrastructure and technology to deal with waste management, coastal erosion and wave surges. Most respondents indicated a lack of

support or motivation by government to act on environmental issues; therefore, without the government support, they were powerless to get things done.

The Government document referring to a Rapid Assessment of Perceptions into Environmental Management in the Maldives (2006) revealed that the government is moving to a more decentralised participative and consultative approach. In line with this, environmental management and education approaches should seek a more participatory community-based approach. Similarly the Third National Environment Action Plan 2009-2013 (2009) acknowledged that the introduction of a decentralised system of governance would be based on seven provinces in the Maldives and be implemented at provincial and atoll levels. However, decentralisation has not been fully implemented by the government and important issues for the local community are not being discussed or dealt with. A number of respondents identified there was still a dependency culture of the atolls on Male', whereby the local community felt they still lacked real authority and were not empowered to make decisions and implement them, due to the dependency on Male' to provide finance, skilled labour, technologies and capital. They sensed the government did not want to empower the local communities with skills, finance and capital to make decisions and deal with development and environmental issues, although one local council representative (40-55/Male) stated,

> "Local community sometimes interact with the private sector, international organisations and NGOs to get things done when the government fail to do so"

Another issue raised by the local community was the lack of communication and interaction between them and government, where a number of respondents spoke of phoning and writing to the government regarding issues such as waste management, erosion, water, sanitation and development issues, without response. As one atoll council representative revealed (25-40),

> "We've been waiting two months for a reply back from the government about the waste management problem in our island, we can't afford to transport the non-recyclable and non-burnable waste to Thialfushi (rubbish island in Male' atoll) so the rubbish keeps piling up".

6.3.1.2 Awareness/Education

Another top-level determinant that was discovered through data analysis was awareness/education. This section discusses awareness/education and how this is perceived by stakeholders to influence the response to environmental issues.

Government

The government's position on awareness and education was conveyed in a number of documents. For instance, the First National Communication of the Republic of Maldives to the United Nations Framework Convention on Climate Change (2001) purports the need for the people to be aware of the vulnerability and fragility of the country. A rapid assessment of perceptions into environmental management in the Maldives (2006) acknowledged that there was a lack of awareness at all levels from government to local levels and there needed to be more consultation and education. The government highlighted how more resources were required to change attitudes, develop knowledge and change behaviours, and that recognised awareness alone would not work. Rather, there was need to identify issues that required attending to in the physical environment. Moreover, it was recognised that there is a lack of strategic environmental education being conducted throughout the Maldives, whereby although communities have a basic understanding of the issues, they lack the power and technical knowledge to make changes happen. The purpose of environmental education activities should seek to empower the communities and promote localised technical knowledge to deal with environmental issues. The Third-National-Environment-Action-Plan 2009-2013 Maldives (2009) revealed the need for the government to enhance their capacity to manage and plan environmental education for the public. The State of the Environment Maldives (2011) indicated there was lack of awareness dealing with soft engineering adaptation due to erosion. There was a lack of awareness and knowledge of sustainable land management, climate change issues and waste awareness and training at all levels and sectors.

Having identified areas that required action, these areas identified appeared to motivate government decisions in terms of resource use and action in regard to awareness and education; however, there are other issues that affected government decision making, such as international organisations' willingness to participate and provide funding for awareness

and education programmes due to the lack of available resources. A significant number of respondents suggested that political priorities such as garnering political support steered government attention and resources to be spent elsewhere. Although government stated the importance of education and awareness in documents, one government representative (25-40/Male) sensed,

> "I don't think it is an important issue for government, there are more important things such as infrastructure projects, awareness and education is a secondary issue mostly left to the NGOs and development partners"

Respondents from the third/voluntary sector and international organisations revealed the Maldives lacks two-way communication between government and local levels; this deficiency of interaction was reported to be due to cultural reasons.

A government representative (40-55/Male) explained that the government have failed on a number of occasions to educate as well as give the resources for islands to become more resilient. Another government representative (25-40/Male) stated,

> "Yes, there is a lack of awareness, but right now we just talk about it but we are not doing much, I can understand, if we can't deliver the basic facilities to people, why would they care about awareness/education projects?"

Respondents in all sectors mentioned the government did take some action concerning awareness and education such as joint projects with international organisations and NGOs, including PR and Media events about climate change and disaster risk, but not enough. However, it was acknowledged by a government representative (25-40/Male)   that there is insufficient awareness in government about the environmental issues that are important for the local community; as the respondent revealed,

> "There's too much talk and money spent on subjects that are media-savvy rather than the real issues".

International Organisations

International organisations have publicised in their agendas the importance of environmental awareness and education. They have based their reports and recommendations for the government on literature and expert opinion such as the consultants they use to conduct their studies and reviews. Their awareness programmes appears to have been influenced by the government as it seeks to build capacity in these

areas and international organisations have sought to support the government through project finance. As one representative from an international organisation (25-40/Female) conveyed,

> "We have learnt over the years it is better to support development projects that the government have included in their plans. This means there's more commitment and we're not out of touch with the national goal"

The UNDP Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009) acknowledged that the local community has a clear awareness of the linkages between environmental degradation and disaster risk; however, poor environmental management of human activities has increased the vulnerability of islands. The poor environmental management of human activities is widely considered the responsibility of the government; as one international organisation representative (25-40/Female) outlined,

> "The government is the executing agency for projects. It is their responsibility to implement the project according to criteria and do any follow-up reporting, but they are not implementing or monitoring projects to the funders' satisfaction"

International organisations have identified that the Maldives needs to improve institutional capacity of human resources and institutional structures in order to improve their ability to undertake donor-funded projects; however a number of respondents considered the government did not improve these areas appropriately. International organisations have conducted a number of awareness and education programmes; for example, the UNDP developing a disaster risk profile for Maldives (2006) revealed the outreach to the general community increased capacity due to the presence of trained people increasing awareness and education in the local community. Furthermore it acknowledges that the UN alongside the government, international organisations and NGOs are involved in the enhancement of disaster management skills and capacities at the national, atoll and island levels through training and awareness programmes. Climate Change and Education Maldives (2010) conveyed that building awareness about climate change hazards and possible impacts on lifestyle through school-based activities and teacher training could be deemed an adaptation measure. The schools in some cases have been active and have promoted awareness programmes. However, with significant responsibility given to the government to carry out awareness and education programmes and with a lack of supporting activities and

resources to utilise the awareness and education, often environmental management is not applied to benefit the community.

Private Sector

The private sector's perspective on awareness/education to respond to environmental issues was shaped by their corporate policy, and owners' and managers' agendas. Some businesses were involved in awareness and education as part of their responsibility to their customers and others for altruistic reasons. Some private sector businesses sensed it was good for PR and that it was part of the social norm to be interested in developing such programmes for their customers. The private sector respondents indicated it was the resources they had set aside for awareness/education that affected whether they would do anything outside of their resort environment. Some resorts were involved in educating local islands about waste management, coral reefs and marine life; others were involved through more direct activities with local islands such as waste collection, beach clean-ups or providing books for local schools.

The Thomas Cook Sustainability Report (2010) revealed they raise awareness about biodiversity to try to protect flora and fauna, as well as looking out for the welfare of animals in tourist destinations. Baros Resort Environmental Policy (2012) outlines their intention to build greater awareness about the crucial role of the ocean in peoples' lives and ways they can help; they offer people the opportunity to participate in learning how to cultivate their own coral fragments. Sonevafushi Resort (2012) expressed that they have been involved in education programmes for local school children about environmental issues, but also educate staff and guests on issues such as waste. Meeru Island Resort (2012) and Vilamendhoo Resort (2012) communicated their policy of giving staff specific environmental-awareness training immediately after their recruitment, and are regularly involved in events to increase environmental awareness such as tree planting and reef cleaning. Furthermore, their policy revealed that environmental information would be displayed on the staff notice boards and activities would be undertaken by utilising the resorts' own human and financial resources, which are primarily funded through their Social and Environmental Responsibility Budget. A number of resorts revealed they educated guests on how to behave around marine life and not to touch the coral; a great deal of their

education and awareness was done through dive schools or marine biology labs based in resorts. With the high number of divers coming into the country, resorts considered it was important to create awareness of behaviour but this did not mean it would stop guests from damaging coral. As one resort representative (40-55/Male) stated,

> "People are aware in Europe about behaviour in the marine environment, but Asia and China are not aware about it, but Europeans are more aware. Some people just don't really care. We need to increase people's awareness and hope it changes behaviour. We put literature in guests' rooms but some don't care because they think they pay so much they don't have to care".

There was a general consensus among the private sector that the government needed to do more to help the local community with awareness and education but also provide the resources to make changes and have better environmental management standards, particularly in waste management. One resort representative (25-40/Male) stressed,

> It's always down to the resorts to take the initiative to do something, the government seem to drag their heels, there needs to be something seriously done to improve waste management in local islands, in terms of awareness, education and finances for them to deal with it.

Third/Voluntary Sector

Third/voluntary sector's perception of awareness and education appeared to be influenced by their agenda: some organisations were influenced by their policy to increase awareness and education in the local community, while others were motivated by more practical adaptation work. The funding and resources available also influenced the type of work undertaken as funding was available for certain types of projects. For example Live and Learn (2012, n.p.) outlines their objectives in the Maldives as: Promoting Education for Sustainable Development to enhance quality of life; Strengthen and support partners in the Environmental Education sector; Improve networking and dialogue about Environmental Education in the Maldives; Explore, share and implement community mobilization strategies for effective delivery of Environmental Education; and Maintain a well-resourced, well governed and well managed organization. Other organisations such as MFF and Bluepeace revealed they were involved in awareness campaigns and projects about the environment, so therefore awareness and education was a significant aspect of the third/voluntary sectors, although it was dependent on the project. Respondents from third/voluntary sector stakeholders mentioned that the local communities they worked with often lacked the

technical skills, resources and finance and lacked two-way communication with the government. Often the government's perception of what was important to the local community was different to what they wanted. One respondent (25-40/Female) revealed,

> "Our organisation reaches the communities and finds out what the real issues are, the government seem to be not engaged with the ground"

Respondents from the third/voluntary sector identified the politics influenced the functioning of government; they felt that constant changing of department heads and staff, unclear roles and responsibilities of different ministries and made it difficult to get things done. Despite this, some third/voluntary sector organisations had created good working relationships with different government ministries. Human resources was considered an area of weakness, because respondents pointed to a lack of technically skilled people to undertake the work and monitor projects, and feed back to donor agencies. Finance was considered something that limited the work of the sector, although some of it was raised from donor agencies and some from government, while other sources included private donors.

The MFF (2009) discussed its work of strengthening the waste management system on Noonu Manadhoo. The objective was to educate women, children and young people about their immediate environment and its interdependence with their health and livelihoods. The project also cleaned the island's waste management centre, beaches, harbour and other public areas. The organisation sensed that the promotion and awareness materials helped communicate the importance of waste management to island residents. Live and Learn (2012) outlines its involvement in a resilience-to-Change Climate project, where the main objective is to ensure that practical action is initiated and future action planned by Island, Atoll and Provincial stakeholders and in particular by island women, to strengthen community resilience to climate change in five islands in Baa Atoll, in the North Province by June 2012 through workshops on climate change, conservation farming, nutritional information and marketing techniques on each island. The responses from all the five communities of Baa Atoll showed that they had an understanding of the climate change issue; however they lacked the knowledge and know-how on how to act on it at the individual, household and community levels. Furthermore, they acknowledged that the local community has a low level of awareness about climate change and its impacts on the

corals reefs and the ground water lens and its link to agriculture. Furthermore, Live and Learn (2012) revealed it was engaged in creating public awareness on solid waste management in the Maldives, by encouraging sustainable approaches to solid waste management such as composting and re-using waste as an environmentally sustainable fertiliser. However, despite raising awareness and education, as one representative from the third voluntary sector (25-40/Male) expressed,

> "We have increased environmental education and awareness but this alone is ineffective without empowering the local communities to take action. Monitoring these places through two-way dialogue, you can educate people on sorting their waste, but if there is no cost-effective mechanism to dispose of their waste what's the point?".

Local Community

Local island communities' opinions of awareness and education were influenced by the agenda and political priorities of the council. Furthermore, some in the local community felt that basic infrastructure and development on their islands such as sanitation and electricity was more important than environmental awareness; as one local community representative (25-40/Male) communicated,

> "We are more concerned with the basic needs of the people right now"

Awareness and education was identified as something that should not be given on its own but rather as a part of a holistic set of tools. As one representative of an atoll council (40-55/Male) sensed,

> "Awareness and education is important but we need the resources to deal with the environmental issues"

The local community revealed that the government were not concerned about providing them with the technical knowledge, finances, capital and real decentralisation powers to deal with issues such as erosion, waste management and other basic development infrastructure. Insufficient communication between the local islands and central government was also acknowledged by respondents; some expressed that the government did not understand the real issues they faced, whilst others revealed the government were too busy to speak to them. Some respondents acknowledged that some local atoll councils were politically connected to the government; therefore they should have a better chance of getting things done, and politics was viewed as something that affected government

willingness to do things. Some local community representatives acknowledged the work done by the government, international organisations and the third/voluntary sector in the local community with awareness and education programmes linked to climate adaptation, resilience, waste management and disaster risk reduction. However, as one atoll council representative (40-55/Male) revealed,

> "It's difficult to get Maldivians to change their behaviour through awareness and education"

Voluntary environmental action was reported by some atoll council leaders but there was a general consensus among respondents that people would not change their behaviour unless there was better monitoring and enforcement, which is not being done, but they did not think it was a concern for the government.

6.3.1.3 Financial Issues

Financial Issues was a top-level determinant that surfaced from the data and was found to be a determinant that stakeholders attributed to affecting their response to environmental issues.

Government

The Government appeared to be highly influential in relation to financial issues that emerged from the data. The budget was developed by the Government through parliament approval; furthermore they decided upon taxation and where the expenditure was spent. Government respondents revealed that decisions about finance were influenced by the political agenda. However, the financial situation in the country was further attributed to the past behaviours of those politicians in power to control spending and taxation, since fiscal and monetary action have time lags before it is felt in the economy. One government representative (40-55/Male) revealed,

> "With a number of budget deficits over the years, the country has had to continually borrow from India and development banks, we are at the mercy of these lenders, this has increased our national debt"

Another government representative (55-65/Male) expressed,

"A lot of the government spending in the last six or seven years has been for political reasons, rather than investment or development, where the country could have reaped the benefits now if there was real investment in the economy"

Furthermore, a government representative (25-40/Male) conveyed that,

"Spending increased after the 2004 tsunami, with increased borrowing for repairing infrastructure and investment, but with increased politicisation of our society since 2006, politicians have tried to garner political support for themselves by promising increasing national budgets which are not sustainable for such a small economy".

Lack of microfinance and high inflation were common issues highlighted by respondents from government. One government representative communicated (25-40/Female),

"There isn't enough allocated for environmental issues"

Furthermore, government respondents acknowledged that there was increasing tax revenue through general sales tax imposed in the country and a significant source of this revenue is from the tourism sector; however, a government representative (40-55/Male) revealed,

"We are still having to make repayments to the Indian government for previous loans that were just used for consumption purposes. We have to use state reserves to fund the loan repayments".

The Maldives National Assessment Report (2010) disclosed that within the island and atolls there is insufficient funding of waste management infrastructure equipment and practices. The Government in the Capacity Development Action Plan, National Capacity Self-Assessment Integrated Climate Change Strategy Projects (2008) revealed the need to establish an inter-agency finance committee on convention obligations to allocate funds through annual government budget to atoll offices to implement convention obligations. The National Progress Report on the implementation of the Hyogo framework for action 2009-2011 (2011) acknowledged the lack of finances which inhibited progress in Disaster Risk Reduction. A government representative stated (25-40/Female),

"We need to acquire more external funding for projects because we can't afford to spend much on environmental issues, but that depends on our ability to show we can successfully implement projects, but we lack capacity"

Most government representatives expressed financial issues in the country were exacerbated by the lack of population consolidation, lack of technical human capacity, geographical dispersion of islands, high transport costs and the dependence on imports such

as diesel, which has fluctuated in price in the world market although fuel is subsidised by the government for the locals.

A number of government representatives did reveal that they had been advised by international organisations since 2006 to decrease government spending by reducing staff; increase tax revenue, reduce budget deficit, reduce overheads via island consolidation, and increase the pool of technical local staff for projects. However, as a government representative (40-55/Male) revealed,

> "The key decision makers have not been motivated to reduce spending, spending increases political support. But we still have this problem where we need to pay for the expanding numbers of local councillors in each island, the large population of parliament with its seventy-seven members representing three hundred thousand people who require very high incomes and expenses and the ever-increasing numbers of people on our payroll".

Government respondents did acknowledge that the high dispersion of islands resulted in increased costs of transport, and insufficient economies of scale at local island level made projects costly to run and maintain.

International Organisations

International Organisations' standpoint of financial issues was predisposed by their agenda and donor funds. If the donor agency had sufficient funds available there was a better chance of providing it for projects. It was also induced by the organisations' operating costs; some had costly administrative bureaucracies while others did not have costly offices to run. Furthermore, the propensity for international organisations to fund was also affected by the Maldives government executing agency's ability to implement the project according to the agreement and provide the correct feedback and monitoring of the project, where failure to do so would have an impact on future funding in some cases. The perception of risk and what they perceived the Maldives was vulnerable to affected the international organisation's attitude to funding; issues such as climate change adaptation and disaster risk were considered priority areas for funding, but other development and environmental management projects were also seen as important issues which the government had included in their plans and which these organisations wished to support.

Other issues are affecting finance included the high cost of transportation, island dispersion and institutional and human resource capacity issues; for example, a representative of an international organisation (25-40/Male) expressed,

> "The islands are highly dispersed so it makes logistics difficult and expensive but there are capacity issues which the government need to develop to have a better future for sustainable funding of projects"

The ADB OECD Validation of the Country Strategy Program Completion Report (2007) communicated there were delays in ministries implementing the sub-projects, which do not have adequate and timely support from the Ministry of Finance and Treasury regarding disbursements and procurement. ADB Capacity Development of the Maldives Energy Authority (2011) revealed that the Maldives Energy Authority's functioning has been constrained by the lack of staff, finances, and an unclear demarcation of roles and responsibilities. Although international organisations have supported the Maldives in developing their capacity, as mentioned in section 6.2.1 regarding stakeholder motivation, the government had the opportunity to develop a pool of technically skilled local staff to undertake implementation and verification of projects through the 'Office of Programmes and Projects' (OPP); however, to date, no concrete measures have been put in place by the government. Therefore, the government still lack the capacity to sufficiently measure, verify and feedback project effectiveness to donors and this reduces the propensity of obtaining funding from international organisations in some cases. IUCN Valuing Bio-diversity, the Economic Case for Bio-diversity Conservation in the Maldives Report (2009) recognised that central government financial support and overseas assistance provide the main funding resources for biodiversity conservation in the Maldives, with a limited amount of private sector funding spent on the resort and surrounding coral reef around the island. Furthermore, the government contribute less than 1% of the total budget for environmental protection, and government spending was revealed to lack essential capital investments, with most of the budget spent represented by recurrent expenditure.

Private Sector

The private sector's outlook about finance was influenced by the business/corporate agenda relating to financing environmental issues. Resorts in the Maldives often spent on cleaning and maintaining the vegetation on the island and cleaning the coral reef surrounding the

island, but some had PR and altruistic intentions of providing environmental education and support to the local community due to the lack of capacity and financial support available to local community. Business revenues and profits influenced their likelihood to spend on environmental issues outside of their resort environment. A number of respondents in the private sector felt that the government budget was not sustainable and put the economy under further threat from increasing national debt levels, while other respondents associated the increasing spending to changes in the political landscape in the country, with increasing number of politicians, political parties, interest groups and island councillors as well as expanding welfare and subsidy payments.

Tour operators tended to spend on carbon auditing, waste management through recycling, and reducing carbon from their aircraft emissions and offices through efficiencies. However, they were also involved in projects in tourist destinations; for example, Kuoni (2012) revealed it has joined the IUCN to support the protection of the fragile coral reefs, and they are involved in funding projects in the Maldives. Meeru Resort (2012) and Vilamendhoo Resort (2012) communicated that that they will fund their environmental activities through their Social and Environmental Responsibility Budget. This consists of 0.5 % of the total annual revenue and the total guest laundry revenue the resorts receive. If they have the land area and resources, some resorts have set up agricultural projects as one resort representative (40-55/Male) revealed,

> "We also produce our own herbs and salad leaves, bananas and vegetables and we also use hydroponics"

Resorts also spend their funds on island erosion control and prevention measures. One resort representative (25-40/Male) stated,

> "Some areas of the beach we fill with sand, also sometimes we protect the beach with sand bags, plant trees around the beach. This is usually done every two years, as filling sand is very costly"

 Beach replenishment due to seasonal shift in sand was a very common practice by resorts, done by pumping sand from the sea floor into the beaches. A number of resorts have spent their own finances on awareness and education of environmental issues; often through Marine Labs that some resorts have set up. These provide both PR for the resort but also

educate their guests; some resorts have provided education and awareness for the local community through their own funding.

Resorts generally invested in energy-saving systems for economic reasons but it was seen as a marketing tool; for example reducing their carbon footprint, as one resort representative (40-55/Male) revealed,

> "To save energy we have installed sensors in guest rooms so that when doors are left open the air conditioning will shut down. During low season we turn off the air conditioning in the rooms that are not being used"

Another resort representative (25-40/Male) expressed,

> "We use solar for hot water in all the guest rooms but we are not using solar panels for anything else. You can generate 200-300kw per day of energy with solar during the daytime if it is connected to the main grid and so will save a lot of energy and then in the evening you can rely more on diesel"

Waste transportation was viewed as costly, with one resort representative (40-55/Male) stating,

> "Since the landfill is far for us, we have supplier boats operating twice a week going to Male'. It's very costly especially because we are so far away from Thilafushi. We also collect the rubbish from the neighbouring local island as well - it's too costly for them".

Resort businesses in the Maldives generally indicated that there was insufficient support from government financially to purchase energy-saving infrastructure on resorts to reduce their carbon emissions. Often respondents revealed a lack of credit facilities, subsidies and tax breaks to create the incentives. Some respondents in the sector felt burdened by the increasing rate of sales tax on the tourism industry fearing it would reduce tourism arrivals and tourism spending, and by the government's inaction to provide waste management, sorting and transportation facilities for local islands and islands that are far away from Male'. Some viewed that local islands expected the resorts to pick up the costs and investments for local islands' needs. The private sector, having the resources, felt able to tackle most environmental issues that arise for the resort, apart from coral bleaching and waste washed onto their beaches.

Third/Voluntary Sector

Third sector/voluntary organisations' outlook on financial issues was affected by their operating costs and the low availability of funding from donors. Respondents from this sector were worried about the continuous government spending for current consumption rather than investing in capital and development. There was a consensus that operating costs were high in the Maldives due to the dispersion of islands and high cost of transportation. In relation to the availability of funds, one respondent (25-40/Male) mentioned that,

> "It is difficult to get funding at times because of the recession, but also the bureaucracy required to apply takes a long time and we have to meet certain criteria"

The sector identified that due to the lack of technically qualified human resources they were not able to meet the criteria for funding or the increased costs involved in recruiting and paying appropriately skilled personnel. One third/voluntary sector representative (40-55/Male) revealed,

> "Communication and networking with the government helps open channels to access funding"

However another (25-40/Female) declared communication and structure of institutions as a barrier,

> "It is difficult to get hold of government people who are the decision makers, there isn't enough two way communication with government departments and sometimes there is confusion over which departments has the responsibility or authority to make the decision"

The third/voluntary sector revealed that they used cost-effective measures to undertake some of their work such as the use of technology through information technology for awareness, education, and training and information exchange with the local community. The role of the media was seen as another cost-effective mode of information transfer but required collaboration with local media companies.

Local Community

The local community standpoint on financial issues was influenced by the budget allocated from central government and the local council's agenda. There was a general consensus

that there was a deficiency of finances provided for the local community in terms of their needs. One local council representative (40-55/Male) expressed,

"We need the government to provide more financial support so we can get things done"

The lack of decentralised powers given to the local atoll councils was deemed as a barrier for them to make independent decisions about how resources would be used, and one local atoll council representative (25-40/Male) declared,

"If we were to have real decentralised powers like they have said they would do, we would be able to get the things done the people need and not be dependent Male'"

However another local atoll council representative (25-40/Male) revealed,

"Finance is not enough. We need to be given the right skills and knowledge to be able to maintain and work any infrastructure or capital development"

All respondents acknowledged the high cost of transportation in the country and the dispersion of the islands made logistics difficult. Often islands far from Male' had to wait a long time for technicians from Male' to come to make repairs due to budgetary constraints. Communication with the government was deemed difficult and time consuming by some respondents, and a number if islands were waiting for the government to get back to them over things they had requested. The local community representatives indicated the lack of financial support for waste transportation - many islands could not afford to transport the waste to Male' so it accumulated on the islands and then was washed away into the sea. One atoll council representative (25-40/Male) suggested that

"Waste centres could be developed in regions similar to Thilafushi but where they can incinerate the waste. It would cost less to transport rubbish but we would still require financial support for transportation, but we could contribute something towards it".

A number of local atoll council leaders acknowledged that many islands still required effective waste management, erosion control, drainage systems for flooding, storm surge mitigation, sanitation, consistent supply of drinking water and sustainable electricity, but have been told the finances are not there to develop them.

6.3.1.4 Technology

Technology was revealed to be a further top-level determinant in the data as it was associated with a number of issues.

Government

Technology was considered by the government as an essential aspect of building capacity in the Maldives; therefore it was part of the government agenda towards a more sustainable future. The First National Report to the Conference of the Parties to the Convention on Biological Diversity (2002) revealed the importance of technology as an area for capacity-building in the Maldives. The Strategic National Action Plan 2010-2020 for disaster risk reduction and climate change adaptation (2010) communicated that technology was an important tool to increase awareness and knowledge about disaster risk reduction. The National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) expressed the need to build a culture of information-based decision-making science and technology. The Strategic National Action Plan for Disaster Risk Reduction and Climate Change Adaptation 2010-2020 (2010) regards easy access for island communities to technology and resources as a way to help reduce vulnerability. Adapting, Implementing and Scaling up Appropriate Technologies (2011) conveys that technological support through equipment such as can crushers, plastic shredders and incinerators has been procured for some local islands. However, government representatives outlined that technology was costly particularly when it was related to energy and waste management; one such representative (40-55/Male) stated that,

> "Even if we buy the waste to energy technology equipment for the local islands it is not cost effective as they don't produce enough waste".

Adapting, Implementing and Scaling up Appropriate Technologies (2011) declared that technology implementation in waste management had been affected by the deficiency of trained personnel, and that revenue required to manage island waste management centres has not been sustainable. One government representative (25-40/Male) communicated,

> "There is a lack of finance to support the waste management technologies in terms of operation".

In the Maldives 3rd Tourism Master Plan 2007-2011 (2007) it was acknowledged that there is a wide technology gap between older and more recently-built resorts' sewage treatment and disposal, and furthermore government representatives suggested there were technological gaps between environmental management systems in resorts.

Energy was the sector in which the government intended to use technologies to reach their carbon neutrality objectives; The Strategic Action Plan National Framework for Development 2009-2013 (2009) expressed that the Government is committed to carbon neutral policy with a switch from fossil fuel to renewable energy by 2020 with a planned 50% reduction in electricity generation by fuel by 2015 by promoting and developing renewable energy. Furthermore the report revealed that the tourism industry with its high dependency on fossil fuels requires technical and financial assistance to revert to alternative sources of energy and to adapt to climate change. The same initiative also identified a number of barriers to renewable energy technology these were insufficient information on options and utilisation, inadequate capability of the key players in the sector in terms of implementation and management of renewable energy technology, and lack of financing. Government representatives communicated the government's intention to develop large-scale wind and solar energy; however, as one government representative (25-40/Male) revealed,

> "There is a lot of talk about getting it done but no concrete actions. We need more feasibility studies and it is not looking positive in terms of feasibility for large-scale wind farms".

Respondents acknowledged there was talk of developing a biogas waste centre at Thilafushi but it has not been implemented. However, there was a general consensus that increasing access to broadband internet in the country had helped communication and information exchange in the country.

International Organisations

International organisations' standpoint on technology appeared to have been influenced by expert opinions, literature and government plans, and they have viewed technology as an important capacity-building area for the Maldives. The UNDP Outcome Evaluation Country Programme Maldives 2003-2007 (2007) communicates their involvement in technology development through projects such as Maldives Renewable Energy Technology Development and Application Project (RETDAP), and Technology Needs Assessment (TNA) which provide the decision makers with educated information to direct and guide the selection, adoption, implementation and use of sustainable technologies that will assist the Maldives to address vulnerabilities related to climate change. The UNDP Cost Benefit Study

of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009) suggests the Maldives should seek the development of new technology, and lower cost innovation, whilst allowing natural adaptation processes to work to their full advantage. The Marine Energy in the Maldives Report (2011) revealed that the techno-economic potential of renewable energy technologies (RETs) in the Maldives is substantial. However, it questions whether economically viable RETs will be implemented due to social, institutional and political factors barriers. Furthermore, the report stresses the importance of creating legitimacy among stakeholders through awareness-raising and successful demonstration of technologies. International organisation representatives acknowledged the high costs of technology which are exacerbated by the geography of the country and the logistics of providing services to highly dispersed islands, and the lack of technically qualified human resources to implement and monitor projects, and identified that better communication was needed between all stakeholders for technology development to be fully utilised by society. Furthermore, they emphasised that the financial resources for technology projects are limited due to funds being needed for development and climate change adaptation measures.

International organisations have been involved in the Renewable Energy Technology Development and Application Project (RETDAP) and the Program for Scaling up Renewable Energy in Low Income Countries (SREP). These projects aim to create new economic opportunities and increase energy access through the use of renewable energy. The SREP programme has developed eight pilot renewable energy projects that include wind and solar hybrids in local islands to assess their feasibility and whether this can be scaled up to local islands. However, respondents indicated that government's inaction in terms of project implementation and monitoring and the failure to enhance the capacity of project beneficiaries hindered the success of projects.

Private Sector

The outlook of the private sectors concerning technology was affected by their corporate agenda, and the attitudes and opinions of managers and owners. The cost was revealed by a number of resorts as a factor whether technology was employed or not as well as the opinions of experts and competitor use and experiences. Technology was regarded as

something which could promote PR and marketing for businesses such as through advertising their reduced carbon emissions and energy-saving activities, but it could also save operating costs as well as reduce the negative impact on their environment. The Thomas Cook Sustainability Report (2010) communicates the company is in the process of establishing a database to improve the collection of environmental data across its companies to enable the business to identify examples of best practice and areas for improvement. Furthermore it states that its airlines are already significantly more efficient than industry benchmarks. TUI Guidelines for Environmental Sustainability in Hotels (2010) expressed that they had developed hotel guidelines to improve environmental sustainability performance but also to reduce their operational liabilities and costs of their hotel partners. Centara Resorts Group (2012) reported they aimed to adopt new technologies that will contribute to lower carbon intensity, increased energy and water efficiency, and reduced resource consumption and waste generation. A resort representative (25-40/Female) expressed,

> "We are just trying to make the power plant more efficient. There is a project, with small lights to lighten roads on the island by having solar energy soon. Recently, bottling our water, we have our own water so limited amount of plastic bottles are being used, some resorts are already using that".

Some resorts were using environmental management systems tied to a certification system such as Travelife and Green Globe which required improved data-keeping and monitoring of waste and chemical use. One resort representative (40-55/Male) declared,

> "For us the thing that worked in our favour was the way that we transited from the tungsten bulbs to the LEDs".

Resorts generally used a number of different technologies such as solar (photovoltaic and thermal); reusing heat created from generators for laundry and heating water; using inverters in air conditioners to save energy and heat water; reuse reducing waste through composting, compacting, crushing and shredding; energy-saving lights; increasing efficiency in desalination plants in terms of energy usage, and monitor use of energy in the system and turn off in areas where it is not needed. However, there was a general consensus among resort representatives that there was a lack of government support and interest in helping the resort to improve the environmental management systems; they commented on the lack of financial support through subsidies, tax breaks and knowledge sharing.

Third/Voluntary Sector

The standpoint of the third/voluntary sector regarding technology was affected by their organisations' agenda and their belief that technology provided solutions for a sustainable future. They were also influenced by the cost of technologies and whether they were cost-effective for the project. One third/voluntary sector representative (25-40/Male) revealed,

> "In general, Maldivians are early adopters of new and luxurious technology but slow adopters of eco-friendly measures that require any level of sacrifice".

In relation to barriers that affect the successful implementation of renewable energy technologies, another third/voluntary sector representative (40-55/Male) declared,

> "There are two things that are currently lacking, financial sources and legislation. In many countries, renewable energy was introduced with financial incentives and a law. Whatever little renewable energy projects we have at the moment are all from international grant aid like the Japanese project of having some areas with solar energy in some buildings in Male'. We have been unable to provide adequate electricity to all the islands, so how can we implement renewable energy such as solar and wind, where initial investment costs are higher. In my opinion, we should look more into wave and wind energy rather than solar as solar energy requires large land areas to place the panels, whereas the wind requires less space and we have good areas with adequate waves available throughout the country for implementing a wave-energy programme".

There was a general consensus among respondents that the country required improvement in human resource capacity and communication and collaboration between local community, development partners and government to implement projects utilising technology and a great amount of research, data collection and monitoring of pilot projects was needed to establish best practice, and information-sharing and knowledge development amongst stakeholders was important. Awareness and education was mentioned as an important tool used by the third/voluntary sector in encouraging stakeholders to accept and be involved in projects but this required developing human capital of the local communities. However, respondents felt the government did not take enough responsibility in its role to develop legislation and the financial mechanisms to develop technology, particularly renewable energy.

Local Community

The local communities' standpoint on technology was influenced by how they saw it contributing to solving problems and issues that they were concerned with and how it

would impact the environment. The attitude of the island council towards technological solutions influenced community support for these types of projects. Individual islands and atolls had their unique concerns and needs, such as erosion control, flood mitigation and drainage, consistent supply of drinking water, sewage and waste management, agriculture, ground water resources, harbours, education, health and enterprise. Respondents generally perceived technology to be beneficial if they understood and were given the knowledge and resources to utilise it, but this was the responsibility of the government which they were not always fulfilling. The main barriers to technological identified by respondents were financial support, technical knowledge and training and communication which they attributed to government failure to provide. For example, one atoll council representative (25-40/Male) revealed,

> "People on the island are capable of handling technology and environmental management activities but if the government are not willing to provide the support services then the people will not be motivated".

6.3.1.5 Communication/Network of Interaction

Communication/Network of Interaction surfaced as another top-level determinant, most significantly from the interview data.

Government

The government's propensity to communicate was partly influenced by the access to resources, as interaction with international organisations who were also donor agencies provided an avenue to access funds for development projects. As one government representative (40-55/Male) described it,

> "Our relationships with our development partners are very important; we have close collaboration with them".

The government was also influenced by its need to communicate information to stakeholders, whether it was laws and regulations or taxation. Political relationships and links were regarded as important communication networks as one government representative (25-40/Male) revealed,

> "I think people are linked along their political affiliations at times, even at government level political affiliation influences relationships".

Political networks between politicians with authority, third/voluntary sector individuals and local councils enabled access to resources; as one respondent from the local community (40-55/Male) stated,

> "These links help get things done".

The level of horizontal communication between government departments was reported as limited; furthermore communication was hindered by the unclear roles and responsibilities of departments, and frequent changes in department names, roles, responsibilities and staff. One government representative (25-40/Female) revealed,

> "There is the constant changing to the structure of the departments and people leaving, we don't know what is happening to the other departments and sometimes we are unsure of changes made to our own. There needs to be better communication and collaboration between departments".

The dearth of communication has affected transparency and accountability in government departments, insufficient auditing and compliance reporting in relation to spending of departments has resulted in the mismanagement of funds, one government representative (25-40/Male) declared,

> "We have no idea of what the other departments are doing and spending money on. There is a lack of communication from departments and communication from the relevant authority checking what is happening".

The government often used the third/voluntary sector through projects as a way to increase awareness and education in the local community. Communication between the government and local communities seemed stronger when there were political messages or promises of development; however when the local community requested resources or for the government to undertake an infrastructure project, the government often did not give timely feedback. One government representative (25-40/Male) acknowledged,

> "We are very slow sometimes in getting back to requests made by local councils; we have so many requests and limited resources".

In the field of DRR however, the National Progress Report on the implementation of the Hyogo Framework for Action 2009-2011 (2011) highlighted communication and message dissemination as ineffective and outreach to wider communities has not been established, as there is no localised early warning system in the communities for potential natural disasters. As one government representative (25-40/Female) communicated,

> "I think Climate Change adaptation has become the government's real interest so issues such as disaster risk reduction has been side-lined somewhat".

However, respondents did generally express that the government did engage in stakeholder dialogue for developing policy by using MPs and Local Councillors as a source of information about the community. Furthermore, they indicated there was collaboration with private sector, international organisations and third sector in meetings and conferences and by sending representatives to local islands to discuss issues. Moreover, government respondents reported that they used the internet to communicate to local islands, and they produced literature and reports for the local community to access. The government generally had high levels of communication with the resorts, for example, through the tourism ministry: MATI seemed to have a significant amount of interaction with the government and often were able to give their perspective on potential new bills and drafts of legislation which could affect them. The government was involved in awareness-raising and information dissemination to most stakeholders, often done through the media and local councils, about laws, regulations and new developments. Most government respondents acknowledged the influence that political actors have in some projects between private and public sectors for personal gain - essentially, political corruption.

International Organisations

International organisations' propensity to communicate was partly due to them being able to access resources, increase awareness and information and to collaborate with the relevant stakeholder groups to get their projects done. One international representative (25-40/Female) revealed,

> "We have to communicate a lot with the government to get funding organised along prearranged criteria, this requires a lot of two way communication over time".

International organisations relied on good communication with both the government and the third/voluntary sector whom they associated with to undertake some or part of their projects in the local community. Communication between international organisations and the local community did occur but not as frequently as they did with the government, although one international organisation representative (25-40/Male) declared,

> "We have conducted consultations with the local community to see what they need and what the issues are".

There was some horizontal communication where organisations collaborated in projects through shared funding, with one organisation taking the lead role; but again the responsibility of undertaking the project was often left in the hands of the government. There was very limited engagement between international organisations and the private sector, as one international organisation respondent (25-40/Female) communicated,

"There is actually very little communication between us and the private sector, we deal mostly with the government and development organisations".

However, there is evidence of limited cross-sector collaboration; for example, the Kuoni-funded project alongside Seamarc and the IUCN to increase knowledge and awareness among local communities and resorts. Furthermore an international organisation respondent (25-40/Male) expressed,

"We are involved in a project with the Tourism Ministry to help the tourism sector adapt to climate change. Basically what this project intends to do is build capacities in the government and industries; building capacities as in informing them on what are the climate change issues that we face; how do we train people to actually revise the laws; and what are the technical laws that we need to build on and revise; what are the gaps that we have? This will be done in year one. Secondly, in year two, we will develop 10 community-based adaption projects between tourism-associated communities and operators, using our seed money".

International organisation respondents generally felt the government could improve their implementation and feedback communication of projects, and furthermore, lack of communication between ministries caused in procurement and project implementation delays.

Private Sector

The private sector's propensity for communication was influenced by potential access to resources, information and for increasing awareness for them and other stakeholders. PR and media was an incentive for the private sector to communicate their actions. Resorts in the Maldives often had high levels of communication with the government, particularly with the Tourism Ministry, and some resorts had high levels of communication with the local community in their vicinity, but other resorts' contacts were mainly with government and suppliers. Resorts had differing reasons to be motivated to communicate with the local community; some resorts found that activities of the local island were having a negative impact on their environment such as waste washing up on beaches, and that instigated them to communicate and find solutions. Others did it for altruistic reasons such as

improving the lives of the local children through education and awareness programmes. A manager in a resort (40-55/Male) declared,

> "The government should be doing more to get resorts to be involved with local islands, some resorts can't be bothered".

Resorts through MATI were actively engaged with the Tourism Ministry and lobbying government regarding issues and developments in the industry. A tourism trade association representative (55-65/Male) revealed,

> "Resorts are very engaged with local community, we doesn't have contact with the local community but the resorts have relationship with islands in their atoll. There is co-operation between some resorts and local island in terms of waste management in some cases. But we here in Male'- engagement is between government, parliament and resorts, we would like to be involved in civil society but people don't view us as part of civil society. They see us as an organisation for businessmen. NGOs and local civil society are reluctant to engage with us unless it is to get money from us. The UN or arms of it, foreign missions in the Maldives, work with us very closely".

Resorts had very good communication with tour operators as would be expected but this was seen as an area where environmental management could be developed, as one tour operator representative (25-40/Female) communicated,

> "We try and get the resorts we work with to see the benefits of Travelife, because it can be beneficial for the environment and make marketing ad PR sense for the resort. Some are interested and sign up, others are just not interested".

Representatives of tour operators felt their main contact point was resorts; they had limited contact with the government, international organisations, third/voluntary sector or local community. They considered their main responsibility in the country lay with the resorts they sent their customers to, although there was high communication within the network of tour operator representatives from different companies. Owner and manager relationships were seen as important areas of contact, because they influenced the business agenda regarding environmental issues and policy. One resort manager (25-40/Male) declared,

> "My personal views on environmental issues have influenced the business to take a more proactive role in environmental management across the business".

Private sector organisations' relationship with political actors and other influential stakeholders was perceived as a way things could get done for the business, for example in planning and construction. EIA consultation businesses often had good communication links

to all stakeholder levels due to their experience working on environmental projects with or for all stakeholder groups. One respondent from a consultant firm (40-55/Male) revealed,

> "It was the work done by some private sector businesses on their own initiative through communication and lobbying at a number of levels that led the government to act and declare Baa Atoll as a Biosphere Reserve of the UNESCO".

Some resorts collect data and conduct research through their own marine research centres and others have collaborated with the IUCN and Kuoni project through reef monitoring, by collecting data on coral growth, coral health, sea temperatures, and marine life, and by sharing information. As one resort representative (25-40/Female) stated,

> "We share data with the marine research centre in Male'".

Third/Voluntary Sector

The third/voluntary sector's propensity to communicate was affected by their need to gain access to resources and funding, create awareness and collaborate with stakeholders. Respondents considered that they had high levels of communication with government, international organisations and local community, but often lacked communication with the private sector. As one third/voluntary sector (25-40/Male) respondent expressed,

> "We have a lot of communication with all levels of society but mostly with the local community, we don't really speak to the private sector very much".

Live and Learn (2012) communicated that it uses a knowledge-sharing and learning method and are involved in distributing documents as widely as possible to all interested parties. Furthermore they have developed a comprehensive primary school teachers' manual and toolkit through consultation with the Royal Melbourne Institute of Technology (RMIT) in Australia, which could be used by schools and environment clubs throughout the Maldives to support existing and new environmental activities. Moreover, Live and Learn outlined their established linkages with relevant stakeholders across the country including the education and environment sector. MFF NSAP (n.d.) revealed it was providing literature to communicate and support the government policies, to reinforce their actions and plans and make recommendations for investment. Political networks was deemed as something which influenced the ability of some NGOs to access funds for projects; if some NGOs were aligned to certain political parties or influential political actors, lobbying was viewed as more

successful in these situations. Furthermore, informal relationships between civil servants and NGOs facilitated getting things processed or achieving feedback on issues. The third/voluntary sector acknowledged that due to high overhead costs, they often had to use the internet for awareness and training, which proved cost effective.

Local Community

The local communities' propensity for communication was influenced by whether it increased the likelihood of getting access to resources, information exchange and creating awareness and collaboration on projects. The main type of communication the local community had with stakeholders regarding environmental issues was related to climate change, disaster risk and waste management. Respondents indicated a high level of communication with the government through local atoll councils to relevant government ministries, but relatively less direct interaction with international organisations. Some atoll councils indicated experiences collaborating with third/voluntary sector organisations and the private sector on limited occasions.

Political climate was deemed to affect government communication and interaction, where respondents perceived that politicians in authority were more willing to do things for islands that supported them than islands which were supporting opponents. One local atoll council representative (25-40/Male) revealed,

> "If there are people in government with political influence from certain islands they are sometimes likely to favour getting things done for their island".

The local community often described government response to their concerns and issues as slow and ineffective; as one local atoll council representative (40-55/Male) stated,

> "The government is very slow in getting back to us regarding issues".

Relationships with the private sector varied, with some atoll councils identifying resorts being proactive and engaging regarding waste issues and environmental education and helping to develop other facilities; as one atoll council representative (25-40/Male) revealed,

> "The resort has close links to us, some of the staff come from our island and we participate in sports activities with them, mostly football tournaments. They also collect our waste every week to take it down to Thilafushi".

Others indicated resorts were not interested and existed without any connection to the local islands. The local communities indicated that they lobbied and informed government through their local council representatives and local MP. It is evident that there is direct communication and links to government through official and unofficial channels but it was unclear at times which government department had the authority and responsibility to take certain actions, moreover, the local community were frustrated by delays in government responses and action. There was also the feeling that the government could communicate more with the local community in terms in trying to change behaviour through awareness in the media, and communicate more with atoll councils over monitoring and compliance of activities and providing the resources to support activities.

6.3.1.6 Institutional Structure

Institutional Structure surfaced as a top-level determinant in the data regarding stakeholders' responses to environmental issues.

Government

The government's perspective on the institutional structure was that Maldives is a small developing economy so naturally it would have a large bureaucracy, government spending would be high and it would employ a high number of civil servants. This outlook was likely to be further caused by the entrenched social functioning that had occurred in the Maldives for a number of years, with successive leaderships not interested in change. Furthermore, political actors and decision makers preferred it to be structured in a certain way so they could influence processes within departments without accountability. One government representative (25-40/Female) expressed,

> "It has been like this way for so many years, I don't think any politicians have really wanted to change it, otherwise they would have tried to do so".

The First National Communication of the Republic of Maldives to the United Nations Framework Convention on Climate Change (2001) outlines how institutional strengthening is needed by improving the coordination and cooperation between the departments. The National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) revealed that responsibility is spread across different ministries, often with overlapping mandates, or gaps in mandates.

Furthermore, weak management and inadequate human resources limit organisational effectiveness, and lack of transparency and accountability is also a concern. Moreover, financial resource allocations were identified as inadequate at all levels, within organisations, at national levels, and at atoll levels. The National Progress Report on the Implementation of the Hyogo Framework for Action 2009-2011 (2011) acknowledged that decentralisation had taken place at government level; however high levels of bureaucracy and issues of resource allocation has limited the conduction of DRR activities. Adapting, Implementing and Scaling up Appropriate Technologies (2011) communicated that institutional constraints in waste management are being affected by as lack of trained personnel and lack of a legislative framework.

The institutional structure was considered to be influenced by the government agenda for expanding political support meaning that, by increasing employment opportunities, it would lead to more favourable reflection of government; moreover it provided a basis for the ruling government to employ individuals and groups who were politically affiliated with them, therefore reinforcing the notion that if government stayed in power they would receive a good salary. Most respondents from the government identified the high level of bureaucracy, frequent changes in formal institutions in leadership, staff and, changes in name, unclear roles and responsibilities and the lack of transparency and accountability of actions, as well as the lack of communication and collaboration between departments. The role of informal institutions was also seen as a burden on public finances, so called 'public co-operatives', as one government representative (40-55/Male) revealed,

> "These co-operatives were set up to give a fixed monthly income for many hundreds of people around the country who do not create any value but get it as a royalty for supporting the government".

Corruption was identified by a number of respondents as a serious issue which has flourished within existing institutional structures of government due to the lack of accountability and responsibility within government departments that handle funds to be spent on public services and development. One government representative (25-40/Male) stated,

> "New department heads appointed for political reasons have just come in and stolen money but no checks were made on their actions, the safety mechanisms".

A number of respondents agreed that changes to institutional structure was required but the responsibility lay with the top-level political decision makers; the view that changes had to be made was reinforced by international organisations through expert opinion with meetings with the government and literature produced. One government representative (25-40/Female) stated,

"I don't think our leaders really want to make real changes, although they have promised change".

Government representatives did mention there was talk of reducing government spending, reducing civil service numbers and increased decentralised decision-making powers at the local level although none of these had been implemented. This has resulted in higher spending due to increased local councillors and high wages and expenses of a high number of MPs; although there has been improved collaboration between ministries, it was regarded as not sufficient. Respondents from the government identified a number of issues that affected government institutions; these were key staff members with decision-making authority do not stay in the job role for long; changes to names and functioning of ministries have caused confusion; pool of local technical staff not developed, and development projects not finished in time and to specifications.

International Organisations

International organisations' institutional structures were often bureaucratic with a centralised structure. However, government agencies were often the executing body for projects; therefore project implementation was more the government's responsibility in certain projects. The ADB OECD Validation of the Country Strategy Program Completion Report (2007) revealed implementation of their country programmes was affected by weak Government institutional capacity. The UNDP Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009) communicated that institutional structures for systematic coordination for DRR are in their fledgling stages, but government acknowledgement of and commitment to developing institutional capacity was a positive step. Furthermore it declared that the institutional challenges for the country include: Lack of coherence and contradictory of national policy and regulatory frameworks; lack of co-ordination and cooperation between institutions with overlapping mandates; weak management with a lack of technical human resources and a lack of transparency and

accountability; lack of financial resources at all levels of society; lack of adequate and timely information and lack of awareness, and lack of monitoring, observation and reporting. International organisation respondents reported that the government were aware of the institutional changes that needed to be made but so far, despite making verbal commitments, as one international organisation representative (25-40/Female) expressed,

"There has been no concrete action that has resulted in improved project implementation".

Another international organisation representative (25-40/Male) conveyed,

"They are obviously putting their efforts and resources into other areas which they think are important".

International organisations have country office representatives or managers to collaborate with and support government; however, both respondents from government and international organisations regarded the project proposal to implementation phase as very slow; furthermore it was acknowledged by international organisation respondents that projects were not being implemented in the designated time framework and measured for effectiveness; and voiced their concerns that it was becoming more difficult to obtain and access funds for new projects.

Private Sector

The private sector's institutional structure was influenced by the purpose, ownership and corporate structure and was often hierarchical in nature. Therefore, a lot of the decision making usually for environmental issues was developed by the senior level hierarchy and developed into company policy; however, those companies that ran audits and used consultants often made changes according to the recommendations of expert opinion in relation to their institutional structure as well as being influenced by competitor actions. For example, tour operators indicated they created structures for more stakeholder dialogue within their organisation as well as interaction and collaboration along the supply chain by influencing hotels and service providers to develop their environmental policy and attitudes. As one tour operator representative (25-40/female) stated,

"We have structure that links us to our value chain, this helps us not only communicate better but ensure we have similar goals when it comes to environmental issues".

However, it was reported by a number of private sector respondents that effectiveness of responses to environmental issues was hindered by the way government institutions were run and managed. One resort representative (40-55/Male) declared,

"It is highly bureaucratic, decision making can be very slow, things need to change".

Another respondent from a resort business (55-65/Male) revealed,

"The government are usually good institutionally when dealing with tourism issues; we are not really dependent on them, but when it comes to national development and handling of finances for development it's not handled well".

Third/Voluntary Sector

Third/voluntary organisations' institutional structure was influenced by the owners and leadership of the organisation. Maldivian NGOs are small with a few members of staff, so they have a loose hierarchical structure, often decentralised, but with a senior manager(s) who was the authority figure. Larger international NGOs have more complex structures but often designate responsibilities to key staff based in the Maldives. However respondents from this sector considered the government institutional structure as more of a concern than their own structures, because government institutions were considered slow, bureaucratic, and difficult to communicate with, inefficient at times and lacking sufficient transparency and accountability. One third/voluntary organisation representative (25-40/Male) conveyed,

"We are limited in our size but we are efficient in terms of project implementation and monitoring our work, but the government are slow to get things done, and departments are unclear where the responsibility for certain decision making and action lies. The way government works and functions sometimes hinders progress".

Local Community

The local communities were often structured around the local council who had the authority for local governance. However, there were local kinship ties between families in local islands and therefore people had a say in what went on. The local atoll council respondents regarded the lack of decentralised powers and autonomy of local communities as something that made their institutional structure less effective and therefore local islanders did not

take them as seriously as they would do central government. Furthermore, respondents generally felt the government were not interested in giving autonomy to local councils despite verbally stating their intention to do so on numerous occasions, and the continuing dependence on central government was a consequence of this. Local community atoll council leaders considered government institutional structures as inefficient, slow and lacking in resources. One local council representative (25-40/Male) noted,

> "We are not given the resources or authority to do things on our own, so we have to rely on central government, but they are slow to get things done or even reply to our initial contact".

Another local community representative (40-55/Male) revealed,

> "There's so often changes to the names and functions of government departments, we are sometimes not sure who to contact and there is confusion on the other end too".

6.3.1.7 Human Resources

Human Resources were revealed in the data as another top-level determinant which was considered to affect stakeholders' responses to environmental issues.

Government

The Government standpoint on human resources was influenced by their agenda on employment, the availability of jobs in the market, current skills and gaps in the local workforce and the amount of graduates produced by the education sector as well as what was taught in the sector. It was important to consider that public and cultural perceptions of certain jobs influenced whether people chose to do a certain kind of job, as in government institutions people were aware of the level of remuneration in contrast to their qualifications as being an important factor. The First National Communication of the Republic of Maldives to the United Nations Framework Convention on Climate Change (2001) and The Strategic Action Plan National Framework for Development 2009-2013 (2009) both highlighted the need to strengthen human resource capacity of the country. The National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) revealed weak management and inadequate human resources that limits effectiveness in government institutions. There is a dependence on donor consultants, due to a lack of staff skills but also a lack of experience and programme resources to undertake the technical work. Furthermore it was

acknowledged that the Maldives requires development of new specialised skills related to convention issues and that insufficient, secure career opportunities and structural issues led to high staff turnover in the Environment Ministry, which adversely affected programme development and continuity.

The lack of trained people in the local community was mentioned by government respondents as an area which required attention. As one government representative (25-40/Male) conveyed,

"It is costly to go out to the islands, it is better to have the people there to do the tasks and send us back the data".

Another government representative (40-55/Male) expressed,

"The government have not shown support to maintain research staff, who are academically qualified, they can provide a lot of knowledge and data for the government".

Furthermore, the representative declared,

"Technically qualified staff are not given the opportunity to carry out their work but given administrative roles to do".

The representative went on to reveal that when they developed the technical capacity of some individuals from the local community so they could undertake tasks, they were not given the jobs by the Civil Service Commission. Another government representative (55-65/Male) stated,

"The Government and the Civil Service Commission don't have an understanding of how other institutions are working, how the professions are working. So until and unless the government, the Civil Service, recognise these professions and try to address them, then this capacity issue will be a very big issue, and the rate of attrition also is very high because people are not very happy, because an engineer returning from home, if you ask him to do clerical work then obviously he will not be happy".

Access to higher education was limited to certain subject areas; although there is a faculty of higher education, a number of students and government staff went abroad for training and this was limited by budgets. Government priority for training and education versus political spending was seen as a factor that affected human resource development, the institutional structure and socially entrenched functions in government departments and ways of thinking affected attitudes to human resource development. In the Maldives College of Higher Education (MCHE), curriculum changes were made to meet job market

demand. The Faculty of Hospitality and Tourism studies forged links with the tourism sector. The government did educate and train government staff through courses and sponsorship on an annual basis. However, the government was seen as failing to implement agreements with the private sector, specifically resort businesses who failed to hire, train and develop enough local staff. The dependence on expat donor technical staff was still found to be the norm for development projects.

International Organisations

International organisations' outlook on human resources were affected by the availability of jobs in their projects, the current skills and education of the local workforce and the motivation of government to deal with labour market issues as well as the support provided by international organisations. International organisations' representatives considered that cultural perceptions of certain jobs influenced people to take jobs; the remuneration was also an important issue in relation to the persons' skills. The ADB OECD Validation of the Country Strategy Program Completion Report (2007) expressed the need to strengthen human resource management systems, and build capacity in agencies with which it works. However, it stipulates that its assistance should be conditional on government appointing qualified staff in those institutions assisted by ADB Technical Assistance (TA). Retention of trained and capable staff was indicated as very important in the report, and incentive programmes were proposed as a tool for this. Furthermore, it revealed building the capacity for development planning and management has not been effective and remains a continuing weakness in the government. According to the UNDP Integrating Climate Change Risks into Resilient Island Planning in the Maldives (2009) report, the Maldives has a shortage of professional capacity particularly within the atolls and islands outside the capital, and capacity within the environment sector is especially limited. International organisation representatives highlighted the lack of local technical staff both for projects and at island level. One international organisation representative (25-40/female) declared,

> "If they are going to attract technical staff to the civil service then the pay has to better suit their skills set; it should reflect market conditions".

International organisations did show support and funded the government to help develop a pool of local technical staff that can be used in all projects without relying on expat

consultants; however it was not developed by the government. Another respondent from the sector (25-40/Male) stated,

> "They have assistance from donors to develop this capacity but not much motivation to get it done".

Private Sector

The private sector's standpoint on human resources was influenced by government laws and regulations regarding human resources, the skills, education and experience required by the market and cost of employment. Private sector respondents indicated that there were certain cultural barriers that reduced the uptake of certain jobs in the tourism sector by locals, such as one private sector respondent (40-55/Male) conveyed,

> "Maldivians prefer to have administrative or office jobs".

Another respondent from the sector (25-40/Male) stated,

> "Maldivians tend to go for jobs in housekeeping or as waiters".

Factors such as availability of locals with foreign languages, availability of locals with international hotel experience, and invested interests and attitudes of resort managers influenced the uptake and training of Maldivian staff. Government motivation to implement training and development agreements affected whether local staff were hired. Although some resorts provided apprenticeships and training for locals, only a few financed the higher education of local staff on management development programmes. Environmental training and awareness creation for staff was undertaken by only a few resorts, which mostly concentrated their awareness programmes on guests. Meeru Resort (2012) and Vilamendhoo Resort (2012) indicated that they educated staff and increased awareness on environmental issues. Resorts that used a certified environmental management system were more likely to train staff in data collection in various departments for reporting back to the auditors. The attitudes and agendas of owners and managers were important factors in influencing staff behaviour and action in relation to environmental issues. As one resort representative (40-55/Male) revealed,

> "My personal view and attitude on the environment protection and litter I try and instil in my staff. If they change their attitudes and behaviour it has effect on them when they are in their island environment".

Third/Voluntary Sector

The third/voluntary sector's perspective on human resources was influenced by their experiences in working in the local community, government laws, regulations and actions but also current trends in the local labour market and issues in the education system. Respondents most significantly highlighted the deficiency of technical capabilities of the local community and this was affected by a lack of awareness and education as well as the dearth of training and resources to go along with it. Furthermore they attributed the lack of local technical staff to most people going to the capital or abroad to get access to higher education, and who often do not return home and settle in the capital. Insufficient training opportunities for the local community provided by the government and the limited financial resources of the government were considered as barriers for human resource development. One respondent from the third/voluntary sector (25-40/Male) expressed,

> "The vested interests of NGO and development organisations influence what is being done in the project, sometimes they are not really developing the people but rather promoting the agenda of the organisation".

Some third/voluntary organisations have political links, so their main aim may be at times to promote the generosity of a political group rather than really generating capacity gains. Often it was indicated although people's awareness increased it still did not really help them overcome or mitigate environmental issues in the islands. Rather, they needed financial, technical and planning support. Some islands were seen as too small to have significant development in human resources and infrastructure, as one respondent from the same sector (40-55/Male) conveyed,

> "It would be very costly to make all this development because they would require a lot of financial support to keep things going";

Rather, population consolidation was proposed as a potential solution for the future.

Local Community

Local communities' outlook on human resources was influenced by whether they had access to training and education opportunities, cost, the current level of skills and education present in the local community and what was needed, and the agenda of the local council regarding human resources. The attitude and cultural perceptions were acknowledged by

respondents as affecting the propensity for Maldivians to engage in the environmental sector, as one local community representative (25-40/Male) revealed,

> "People generally more interested to work in office or civil service jobs, working in waste management won't appeal to many people especially when the salary is low."

Another respondent highlighted that the lack of finances and costs affected the ability to employ people, which the local atoll council could not afford to do. Another respondent from the same sector (40-55/Male) expressed,

> "If the education system can be aligned in such a way that training programs can be organised based on industry requirements, than it would help".

Decentralisation was often conveyed as a way to help redistribute resources and authority for the atoll councils to develop their human resources and environmental management services; most respondents agreed it was up to central government to implement this, but a number felt it was hindered due to other political priorities. A number of atoll council representatives indicated they had a deficiency of resources to tackle environmental risks, and human resources was an important part of the other resources such as sustainable finance, technology and communication with development partners, but this required the government being willing to provide or at least help develop these areas.

6.3.1.8 Political Corruption

Political Corruption surfaced as another top-level determinant in the data, specifically from interviews. This section examines how it influenced response to environmental issues.

Government

Government determination to tackle corruption was influenced by the political agenda and by political actors. The respondents from the government identified that political parties, MPs and local councillors influenced how funds were spent. Those who headed government departments responsible for resources used in different sectors were often related to a political party. A government representative (25-40/Male) revealed,

> "It's common for political parties to turn a blind eye to the actions of their members or associates".

Another government representative (40-55/Male) expressed,

"The political climate in the Maldives has accelerated the level of corruption in society".

Respondents agreed there was a problem of corruption in the Maldives in terms of making payments to officials to get things done and the constant transitions of government departments, and with new political actors emerging with influence in government institutions this has resulted in widespread corruption. One government representative (25-40/Male) conveyed,

"Some people who are in positions of power try to get as much out of the system while they are in power or in a position where they have access to resources".

Furthermore, respondents agreed the rapid privatisation of government-owned companies was undertaken in a questionable manner; one government representative (40-55/Male) declared,

"A number of state-owned assets are being sold but the bidding process is unclear and it seems politicians are involved as brokers of these deals so are getting royalties, even if it is not to the highest bidder".

A number of respondents felt that there was a lack of transparency and accountability in terms of the actions of the leadership in government departments and the government were not motivated to create transparency or accountability because, as one government representative (25-40 Female) revealed,

"I think certain political actors are benefiting from these funds so they are not interested in changing it".

There was a feeling that top-level political actors could override the rules and regulations which the government departments have to keep to, as one government representative (25-40/Male) conveyed,

"Sometimes we get told to do things which we should not do but because it is being asked by the President's office or a high-level politician we feel we have to".

Another government representative (25-40/Male) communicated,

"Politicians with authority often put associates and friends onto boards of state-owned companies with large salaries rather than on merit".

Political corruption was deemed to affect donor finance for environmental projects as well as contracts to undertake environmental management in local islands. As one government representative (25-40/Female) revealed,

"Funds for specific development projects have sometimes disappeared".

Another government representative (40-55/Male) stated,

"Some politicians who are also business owners win contracts due to their political links for environmental projects but they are not held to account if the work is not done or to the right criteria".

Political corruption was said to affect financial issues in the country because discretionary government spending affected the amount of money in the public purse. It also meant there was less money spent on projects and projects were not implemented fully, or at all. It was acknowledged by respondents that the Anti-Corruption Commission, the Police Integrity Commission and the Human Rights Commission were present in the Maldives; however, all were burdened with a heavy workload, and all require further capacities such as financial resources and more technical human resources. It was also noted that public funds were often used for campaigning and expanding political party membership. The government was deemed, as one government representative (25-40/Male) revealed to,

"Pay lip service to tackling corruption".

However, in reality, respondents felt government institutions often have unclear mandates and unclear responsibilities, and frequent changes in name and leadership contributed to the lack of transparency and accountability, which allowed for corruption to flourish. It was also acknowledged, though, that policymakers were not motivated to make changes and put into place compliance and preventative mechanisms such as enforceable punishments.

International Organisations

International organisations' perspective on corruption was affected by the culture within the country, behaviour of political actors in the country, the political climate and the lack of government motivation to deal with it. Representatives from this sector considered corruption as hindering transparency and accountability of government departments, and negatively affecting project implementation as well as impeding capacity-building in the country. The politicised culture was considered to cause factions in society along political perspectives. One international representative (25-40/Female) expressed,

"We have to work with the government, a lot of the responsibility for project implementation is on them to do, but corruption doesn't help and it gives the country bad press".

Another representative from the same sector (25-40/Male) revealed,

"It's the responsibility of the government to make sure they have the right people in these jobs but also the rules and regulations in place to stop corrupt behaviour and punish those who behave in that way".

It was identified that funding for projects could be affected or withdrawn due to corruption, but already the lack of government motivation to implement and measure the effectiveness of projects was affecting funding.

Private Sector

The private sector's outlook on corruption was influenced by the behaviour of political actors, political climate and government agenda regarding corruption and behaviour towards it. Respondents from resorts identified that corruption was a significant factor in the Maldives; however one private sector representative (40-55/Male) revealed,

"I have seen that corruption is now even worse than before, it's now political parties and politicians trying to get to power, authority and money, being in government is like being in a business, if you have political power you can control all different types of government revenue and how it is spent".

It was widely acknowledged that there was a lack of transparency and accountability of government institutions and actors, with a lack of punishments and negative consequences for corrupt actions, so people were not deterred. Some respondents acknowledged that politicians were involved in fixing bids for resorts or securing resorts for businesses outside of the rules and regulations but the government had turned a blind eye to this type of behaviour for many years. Furthermore, respondents from the sector felt aggrieved that political clashes had spilled over into creating negative publicity for the tourism industry, as one private sector representative (40-55/Male) declared,

"The political tensions are not in the resorts, it's unfair politicians have tried to create this image of instability and fear for their own political gain".

Another resort representative (25-40) communicated,

"People in the Maldives need to know that with greater freedom comes responsibility and accountability, freedom doesn't mean you can do anything you like and be free from the consequences of your actions".

Third/Voluntary Sector

The third/voluntary sector's perspective on corruption was influenced by the actions of political actors and government rules, regulations and action corruption. Respondents from the sector agreed there was significant corruption in the Maldives and that it was also found in the political sphere where government decision making was important for environmental projects. Some respondents acknowledged that some NGOs access finance through political affiliations and links to government and, furthermore, working in local islands, some NGOs take a political stance during projects while others are more neutral. It was generally agreed that political corruption affected financial issues in the country, as one third/voluntary sector representative (40-55/Male) stated,

> "Increased government spending through loans and taxes have not been mainly for development but rather for political purposes and support".

Furthermore, the responsibility of reducing corruption was considered the responsibility of the government; however as another respondent from the same sector (25-40/Male) conveyed,

> "Politicians benefiting from this are not likely to want to change it".

Local Community

The local community standpoint on corruption was influenced by government agenda and actions, politicians' actions, and experiences of the local atoll councillors. Respondents generally agreed that Maldivian society had become highly politicised over a number of years which caused tensions and fractures in society. As one local community representative (40-55/Male) expressed,

> "Islands that were often calm and peaceful have caused splits in communities due to politics, even within families".

 Atoll councils were associated with political parties so they would often promote their political agenda in the island and would lobby for their relevant party when it came to elections. Respondents agreed that corruption was prevalent in the Maldives and agreed political corruption influenced to some extent decision making and actions of the government. One local community representative (25-40/Male) revealed,

"There are reports sometimes that people in charge of government offices or institutions have stolen money, or funds go missing".

Furthermore another local community representative (25-40/Male) declared,

"Politicians through their links have helped family members get positions in government businesses".

Another local community representative (40-55/Male) communicated,

"Corruption affects us all, there should be measures taken to prevent it, through rules, regulations and punishments".

Furthermore, respondents generally agreed corruption affected the country's development, because it was seen to affect the amount of money available for the local community for development. It was also considered that the lack of government motivation to deal with curbing corruption was similar to their lack of motivation to give powers and authority to the local community: it was about central government retaining control.

The next section explains the results of the analysis of the discussion above relating to how the determinants affect stakeholders' response to environmental issues, by reporting on the identification of the key determinant.

6.4 KEY DETERMINANT AND ENVIRONMENTAL ISSUES

Following the discussion above, it was found that the most dominant - or *key* - determinant, was that of *government motivation* as it appeared as the main causal factor according to stakeholders in the context of the other top-level determinants. The determinants that resulted from a lack of government motivation were: political corruption; lack of stakeholder awareness and education; human resource situation; lack of stakeholder communication; lack of stakeholder motivation; lack of transparency and accountability, and lack of appropriate fiscal and monetary action. These determinants influenced and affected the capacity issues of awareness/education; technology; communication/network of interaction; human resources; institutional structure, and financial Iisues, and these capacities in turn affected the response to environmental issues. It is important to note that the main environmental issues that came up in the data were related to climate change (adaptation and mitigation; sea level rise, coral bleaching, erosion, extreme weather, water resources, energy, coastal zone management); disaster risk (adaptation and mitigation); and waste management (pollution, sanitation, environmental management). Therefore, when

referring to 'environmental issues', the thesis is referring to climate change; disaster risk; and waste Management.

A model was developed to help illustrate how the key determinant interacts with other determinants and capacity issues, and how this affects response to environmental issues in the Maldives. Chapter eight explains and illustrates the key determinant Model.

6.5 CHAPTER SUMMARY AND CONCLUSION

This chapter reported findings of an analysis of documents from stakeholder sources through the broad topic areas discussed which were: environment; climate change; disaster risk; waste management; adaptation and mitigation; and capacity/resource issues. The frequencies with which the topics are mentioned by stakeholder groups were noted in a table. It was revealed that the private sector, especially resorts made little mention of disaster risk because it would have been seen to cause a negative perception of the tourism industry rather they revealed their commitment to protection of the environment through adaptation, mitigation and developing the capacities of the local community.

The third/voluntary sector emphasised the importance of the environment and mentioned the work and projects they undertook in relation to climate change, adaptation and mitigation, disaster risk, waste management and the ways they helped develop local communities' ability to environmental issues especially through awareness and knowledge development. The documents produced by international organisations and the government both frequently mentioned the importance of the environment especially tackling climate change as this was seen as a political priority at the national level, furthermore adaptation and mitigation were viewed as tools to deal with environmental issues of the country.

Disaster risk and waste management were viewed by all stakeholders as something to be tackled especially at government and international levels. Capacity/Resources issues was well documented most significantly in government and international documents since there has been extensive reports written by experts and consultants on behalf of government and international organisations about what limits the Maldives ability to deal with, cope and implement environmental policy.

The chapter then reported the findings of an in-depth analysis of the combined data from documents and interviews and explained how the themes/topics found would be referred to as 'determinants' (concepts of interest) to give consistency to the discussion. The analysis identified eight top-level determinants: *Stakeholder Motivation; Awareness/Education; Financial Issues; Technology; Communication/Network of Interaction; Human Resources; Institutional Structure, and Political Corruption*. These were discussed in turn by explaining the events or variables that led to the occurrence or development of the determinant including consequences by giving examples from document and interview data.

Stakeholder motivation was examined as the data showed that the government was not only influenced by the fragility and vulnerability of the Maldives environment from external events but also the personal motivations of political actors influenced how the government behaved. Issues such as waste management and basic sanitation and developmental needs needed to be balanced between taking action on climate change issues. It was further identified that political priorities became key motivations that influenced government behaviour, in order to control resources and stay in political control required certain actions and behaviours at the detriment of tackling environmental issues. Furthermore government motivation is deemed to be a significant causal factor of stakeholder motivation, as a number of stakeholders motivation to deal with environmental issues were influenced by certain capacity constraints, for example lack of finance, awareness, and communication however these capacity constraints identified by the international organisations and the government themselves were not being addressed by the government.

Awareness and education was another top level determinant that was influenced by government motivation, although the government have identified the need to develop awareness and education in documentation however this didn't mean it was undertaken effectively in reality. All stakeholders acknowledged the need for awareness and education, the third/voluntary sector and some in the private sector were involved local community awareness projects however all stakeholders felt the government was not doing enough to tackle awareness and education in relation to environmental issues. The lack of government motivation to tackle environmental awareness/education shortfall exacerbated the country's awareness/education capacity constraint. There was a general feeling that significant environmental problems were being side-lined due to the government's

preoccupation with political issues and PR by talking about how the Maldives will be under water in the not too distant future. Important issues such as drinking water resources, erosion, drainage, storm surges, flooding and waste management were not being tackled properly. The government has seemingly failed to align and understand the perceptions of risk and vulnerability to environmental issues by not engaging with all stakeholders and this has resulted in a number of issues not being tackled properly.

Financial issues were also a top-level determinant as it was deemed to influence capacity issues in the country. The government are highly influential when it came to the financial matters at the national level as they set the budget with parliamentary approval, decide how it is spent and they collect and set tax rates. Stakeholders perceived the government action regarding financial situation in the country was ineffective and hindered the response to environmental issues in the country. For example the increasing size of the civil service was seen as something the government failed to tackle as this required significant amount of the budget to go on civil service wages, the government were borrowing to make up the annual shortfall and the national debt was expanding therefore there was less available for spending on environmental issues such as adaptation and mitigation of local islands against storm surges. The lack of finance hindered the local community especially as they were dependent on central government for funding of local projects, the private sector were less dependent on government finance but felt there was little financial incentive for them to invest in environmental management systems. International organisations revealed the government's lack of motivation to implement and verify donor funded projects affected future funding by donor agencies.

Technology was also revealed as a top level determinant because the government considered it as an essential aspect of building capacity in the Maldives. Technology has been shown in government and international organisation documents to be a potential tool to reduce the Maldives vulnerability to climate change and also as a way to reduce tis dependency on diesel. However stakeholders revealed that government had not done sufficient feasibility studies on technologies such as wind and where technologies are appropriate such as waste management, they have not implemented those technologies due to cost issues. Stakeholders perceived social, institutional and political barriers would hinder implantation of viable technologies, these barriers were seen as the responsibility of

the government. International organisations revealed technology projects such as the Program for Scaling up Renewable Energy in Low Income Countries (SREP) which developed pilot projects in 8 local islands based upon hybrid energy technologies. However the success of this project would depend on the government's ability to implement them, measure, record and verify the data so that it could be replicated in local islands. The private sector generally developed technologies for altruistic, PR or for economic reasons but felt the government did not support them down the technology avenue. Local community reported that without the right awareness and education, sufficient trained personnel and the financial support of the government there was little that they could do.

Communication/Network of interaction was revealed as another top-level determinant, the motivation for the government to communicate was partly influenced by the access to resources because interaction with international organisations who were also donor agencies provided an avenue to access funds for development projects. The government did communicate information to stakeholders such as laws and regulations or taxation. However political relationships and links were regarded as important communication networks both formally and informally among political actors other stakeholders. It was revealed due to a lack of horizontal communication within government departments there was insufficient communication being delivered to staff especially in relation to changes in department role, responsibilities and changes of staff. International organisations stated the lack of government motivation to communicate important data on project outcomes. The private sector generally tended to have good communication with the government, the resorts in the Maldives mentioned there high level of communication with the tourism ministry. The third/voluntary sector acknowledged the government had done some work with increasing awareness but it was often left down to the third/voluntary sector to do a significant amount of the work and some respondents perceived it difficult to communicate with the government at times. The local community revealed that the government were often slow in providing feedback on environmental problems and issues they had reported to the government, a number of islands had been waiting a number of months for a reply.

Institutional structure surfaced as a top-level determinant as a number of documentation produced by the government and international organisations had revealed that the high level of bureaucracy and problems with resource allocation had negatively affected

responses to environmental issues such as disaster risk reduction activities. Government representatives in the interviews acknowledged the large bureaucracy and high government spending. Furthermore, respondents from the government perceived that entrenched social functioning of the system had been that way for a long time and successive leaderships had not been interested in change. Furthermore, the institutional structures enabled political actors to influence processes within departments without accountability therefore it was unlikely to be changed. International documents revealed, Institutional structure of government lacked co-ordination and cooperation between institutions with overlapping mandates; weak management with a lack of technical human resources and a lack of transparency and accountability; lack of financial resources at all levels of society; lack of adequate and timely information and lack of awareness, and lack of monitoring, observation and reporting. International Organisation representatives echoed what was mentioned in documents. The private sector, third/voluntary sector and the local community all identified that the institutional structure of the government hindered the ability of the government and other stakeholders to respond to environmental issues and allowed for corruption to flourish because of the lack of accountability and transparency. The local community perceived the lack of decentralised powers and autonomy of local communities as something that made their institutional structure less effective furthermore, respondents generally felt the government were not interested in giving autonomy to local councils despite verbally stating their intention.

Human resources were revealed in the data as another top-level determinant. It was reported by both government and international organisations in the documents and interviews that the lack of local technical staff had an impact on the implementation, measuring, reporting and verifying of projects. For example the government was given the opportunity to develop a pool of local technical staff OPP (Office of Programmes and Projects) which they could use for donor-funded projects and would reduce the dependence on costly expat consultants who would only be there for the duration of the project. However an international organisation representative stated nothing much has been done by the government to develop OPP. Furthermore, government acknowledged that a lack of secure career opportunities, low remuneration for skill level and structural issues led to high staff turnover in the Environment Ministry, which adversely affected programme

development and continuity. The lack of appropriately skilled staff across the atolls increased government costs, because local islands were reliant on the government sending staff from the capital to outer islands (travel was dependent on weather conditions and budget capacity) to do routine maintenance work which could have been done by islanders if they had received the training. Resorts that used a certified environmental management system were more likely to train staff in data collection in various departments for reporting back to the auditors. The attitudes and agendas of owners and managers were important factors in influencing staff behaviour and action in relation to environmental issues. Both the local community and the third/voluntary sector stated that the local community human resources needed to be developed in a holistic manner which requires having the technical skills which matched the industry requirements, decentralised authority to the local council and sufficient financial resources.

Political corruption surfaced as another top-level determinant in the data, specifically from interviews. Government determination to tackle corruption was influenced by the political agenda and by political actors. The respondents from the government identified that political parties, MPs and local councillors influenced how funds were spent. Those who headed government departments responsible for allocating resources were often related to a political party. The government institutional structure enabled corruption to flourish due to the lack of transparency and accountability. Political corruption was said to affect financial issues in the country because discretionary government spending affected the public finances and the funds available for developmental and investment needs. International organisation representatives stated that it was the responsibility of the government to address corruption as it hindered transparency and accountability of government departments, and negatively affected project implementation as well as impeding capacity-building in the country. The private sector, third/voluntary sector and the local community acknowledged political corruption impeded the country's ability to respond to environmental issues; however the political motivations of key actors stifled progress on addressing the institutional conditions under which corruption has flourished.

Finally the chapter identifies the key determinant influencing all other determinants as *'Government Motivation'* as this arose in all of the top level determinants during the discussion and was identified as the most influential variable in the data. Government

motivation has resulted in a variety and multidirectional consequences, behaviour and actions that influence stakeholders' response to environmental issues. The main environmental issues in the Maldives stakeholders are concerned with are climate change, disaster risk and waste management. The next chapter explains and illustrates the *'Key Determinant Model'* and anticipated variations in the model at different sector levels.

CHAPTER 7 – KEY DETERMINANT MODEL

7.1 INTRODUCTION

This chapter first explains the concept of *Government Motivation* and presents the *Key Determinant Model (*see Figure 7.1)*, which was developed to illustrate the relationship between government motivation and responses to environmental issues in the Maldives. Second, the chapter explains the Key Determinant Model and how the seven top level determinants – *political corruption; lack of stakeholder awareness and education; human resource situation; lack of stakeholder communication; lack of stakeholder motivation; lack of transparency and accountability, and; lack of appropriate fiscal and monetary action –* relate to the capacity issues – *awareness/education; technology; communication/network of interaction; human resources; institutional structure, and; financial issues –* that have arisen or been exacerbated by government motivation, and how these capacity issues have affected the response to environmental issues, including climate change, disaster risk, and waste management. Finally, the chapter discusses how the Key Determinant Model may vary in other sectors, and when focusing on specific stakeholders' perspectives.

7.2 THE KEY DETERMINANT MODEL

Government motivation can contribute to the intrinsic or extrinsic stimulus that drives a subject towards a particular goal or elicits specific actions in order to realise this goal; it therefore helps to generate certain behaviours. Motivation can include political will, knowledge, strength of opinion, and the importance or prominence of that opinion in public affairs. Moreover, motivation is a more overarching term than political will; the former can include a varied and multidirectional set of outcomes, behaviours and actions, whereas the latter seems more unidirectional in terms of action or inaction.

This section explains and presents the Key Determinant Model, which is a simplified illustration of how the top-level determinants, capacity issues and environmental issues are influenced by the key determinant, namely 'Government Motivation'. Furthermore, the model shows how the top-level determinants and capacity issues interlink and affect responses to environmental issues. The dominant environmental issues found in the data, namely climate change, disaster risk and waste management.
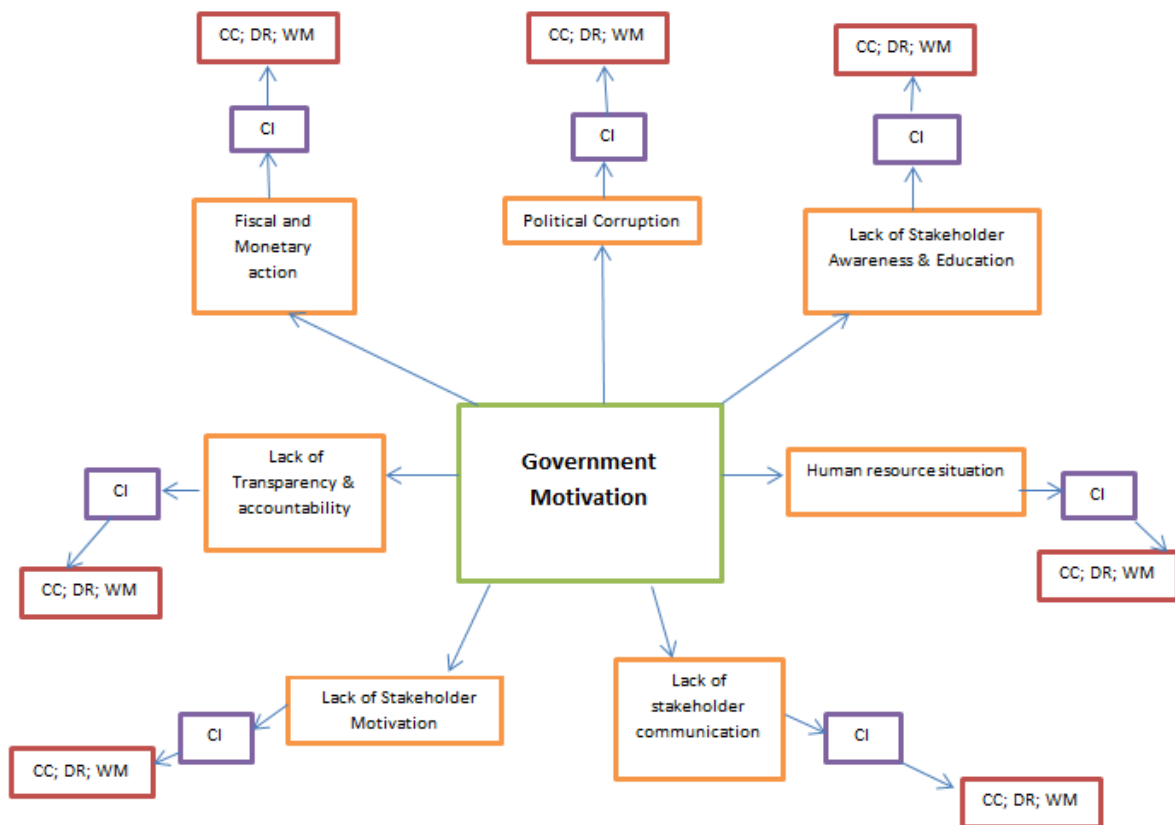
FIGURE 7.1: The Key Determinant Model: Government Motivation Influences the Abilities of Stakeholders to Respond to Environmental Issues in the Maldives

The abbreviations used in the Key Determinant Model diagram are as follows:

Capacity Issues: CI = (which include, Financial Issues; Awareness/Education; Technology; Communication/Network of Interaction; Human Resources and Institutional Structure)

Environmental Issues: CC = Climate Change; DR = Disaster Risk; WM = Waste Management

7.3 EXPLANATION OF THE KEY DETERMINANT MODEL

Government motivation can depend on the subject wanting and choosing certain behaviours. In the context of this study, government motivation relates to the goals set and values expressed by government in documentation and through interviews regarding the response to environmental issues in the Maldives, and whether actual behaviours and actions conform to what is required to reach these goals and values.

Although stakeholder motivation will differ in terms of stimuli and goals depending on the stakeholder, it is the predominance of government in all national affairs that has led to government motivation being particularly influential, and acting as both an intrinsic and extrinsic stimulus, which is able to manipulate the direction of 'top-level determinants', which include: *political corruption; lack of stakeholder awareness and education; human resource situation; lack of stakeholder communication; lack of stakeholder motivation; lack of transparency and accountability, and; fiscal and monetary action*. These 'top-level determinants' in turn affect capacity issues, which are: *awareness/education; technology; communication/network of interaction; human resources; institutional structure, and; financial issues.* In turn, these capacity issues influence stakeholders' ability to respond to environmental issues in the Maldives, in particular, climate change, disaster risk and waste management.

The Key Determinant Model shows that if the government were motivated to act on top-level determinants, this would result in a chain reaction in actions and outcomes, which would lessen capacity constraints. By addressing capacity constraints, stakeholders' ability to respond to environmental issues would be greatly improved.

For example, by taking fiscal and monetary action to improve the financial situation of the country, the result would likely be less borrowing to meet budgets, reduced national debt, reduced civil service numbers, and the tackling of inflation – in other words, it would mitigate financial capacity issues, resulting in a more favourable financial situation in the country. Stakeholders at all levels often report that lack of finance availability is often a barrier to dealing with Waste Management issues, thus a more favourable financial situation would overcome this constraint; furthermore, it would provide financial support to technology capacity development, which is another area that has been noted by stakeholders as requiring financial support. However, it is important to note that taking appropriate fiscal and monetary action alone will not be sufficient to adequately address financial capacity issues, as the data showed that other top-level determinants also have an influence on the financial issues in the country. For example, the lack of transparency and accountability within government institutions can negatively impact the financial situation of the country, as it provides the conditions for political actors and heads of departments to have undue influence within government institutions; the lack of audits showed that

resources meant for development and disaster risk had gone missing in some departments. Furthermore, the lack of transparency and accountability exacerbated political corruption, resulting in discretionary spending and misappropriation of resources. Therefore, government need not only to be motivated to take appropriate fiscal and monetary action to adequately address financial capacity issues, but it must also tackle the lack of accountability and transparency within institutions, and address political corruption, amongst other things.

With regards to the lack of awareness and education top-level determinant, if there is inadequate motivation to address this problem, there will also be an impact on the communication/network of interaction of stakeholders. If the government fails to develop multiple layers of two-way communications with stakeholders, create awareness and communicate information, government perceptions and understandings of vulnerability and risk in relation to environmental issues will be limited. A lack of government understanding means that the more immediate problems faced by stakeholders, such as erosion, drinking water resources, coastal and marine management, flood prevention and waste management are sometimes overlooked. If communication and awareness was improved, there is a greater likelihood that government will make budgetary changes to suit these immediate environmental needs.

Both political priorities and budgetary constraints due to inappropriate fiscal and monetary action could influence government motivation to invest in human resources and limit human resource budgets. A lack of investment in and training of human resources, and limited budgets is likely to result in human resource capacity issues; in the Maldives this has resulted in a lack of local technical staff to assess and implement projects. Inadequate government motivation to recruit, educate and train local-level staff to undertake tasks at the local level, has resulted in a reliance on staff from the capital travelling to local islands to undertake these tasks, which increases government costs and is time consuming, thus further exacerbating financial capacity issues. Furthermore, budgetary constraints mean that technical staff often have relatively low salaries – a problem that could be improved with appropriate fiscal and monetary action – contributing to a high staff turnover. The third sector and international organisations play an important role in training, education and awareness, but this is an even more expensive process than for government as not only

does to the geographical dispersion of islands generate high travel costs, but these organisations are dependent on expatriate technical staff for the provision of training . The lack of appropriately skilled staff with appropriate resources has had a knock on effect on the ability of the Maldives to tackle environmental issues.

Government motivation for power consolidation and political patronage has resulted in it failing to address political corruption, which has led to exacerbated financial capacity issues, and reduced resources to spend on environmental projects. Furthermore, by not dealing with the lack of accountability and transparency of institutions it has exacerbated the lack of institutional capacity, and allowed corruption to flourish as key decision makers are not held to account over the way they spend and what they do with financial and other resources. In addition, the lack of stakeholder communications has hindered the transparency of government behaviour, caused disorder within government departments, and resulted in the development of informal channels of communication based on political patronage, which has encouraged further corrupt behaviour. These factors are made worse by the highly dynamic nature of the Maldives government institutions and departments; frequent name changes for ministries have accentuated confusion, and as government often fails to make the accompanying institutional changes, enhance communication, and ensure transparency and accountability, these ministries often have unclear mandates and responsibilities, providing further opportunities for corruption to occur.

The powers and influence of political actors have undermined the functioning of government departments and undermined financial compliance. Non-reporting by the government can be linked to the institutional structure, which lacks transparency and accountability. Therefore, donor funds can be mismanaged, and disappear through political corruption, thus affecting the finances available. There is also a seeming lack of motivation by government decision-makers to implement and follow the terms and conditions of funding projects, as shown by the responses of international organisations. Decentralisation would have allowed local-level decision-making powers, accountability and transparency, but this has not been implemented. Thus, corruption is allowed to continue, and the institutional structure of government departments remains unchanged, therefore hindering effective implementation of environmental projects.

Government motivation has a significant influence on the motivation of other stakeholders; if the government creates the right economic conditions, provides the financial support, enables accountability and transparency of its structures, develops horizontal and vertical channels of communication, enhances the awareness and education of all sector levels, not only will the capacity barriers that stakeholders face be reduced, but the stimulus for stakeholders to take action will be provided. As mentioned previously, government motivation to communicate with stakeholders can influence the amount of awareness and education in society, and increase understanding of environmental issues and the needs of stakeholders as a consequence of these issues. Moreover, stakeholder communication not only refers to vertical communication between different sectors, but also horizontal communication within government departments. However, for this to occur the government will need to enhance the accountability and transparency of institutions; this will require developing the capacity of institutions, which will result in reduced political influence on institutions, as well as better resource allocation and use.

Technology capacity issues are caused by the lack of communication among stakeholders' especially the government by not having adequate enough dialogue with donors reading the reporting, measuring and verification of technology projects. The lack of communication within government institutions affects implementation of projects. There is also a lack of awareness/education about the technologies most appropriate for the country, this lack of awareness/education has a knock on effect to the human resource situation in the country because there are not enough people with the technical knowledge and skills to implement or develop technologies. Inappropriate fiscal and monetary action result in weak financial capacity meaning there in insufficient funding of technologies. All these capacity issues result in affecting the country's ability to manage environmental issues such as storm surges because appropriate wave breakers are used or not used, inadequate infrastructure and a lack of appropriate staff to manage waste within atolls and the lack of sustainable energy within the local community due to the ineffective implementation of energy projects and a lack of appropriate staff and finances to manage the new systems.

From the discussion it is evident that capacity issues constrain the ability of the Maldives to cope with environmental problems, the data showed and the key determinant model

illustrates climate change, disaster risk and waste management are especially areas that stakeholders are most concerned about.

Climate Change

Insufficient finance, a dearth human resources, inappropriate institutional structures, inadequate awareness and education, low levels of communication and lack of technologies have adversely affected the Maldives' ability to adapt to and mitigate climate change, resulting in the limited development of appropriate infrastructure in local islands, such as sea walls, wave breakers, drainage, sustainable energy and drinking water protection and storage. Issues such as sea-level rise, coral bleaching, erosion, extreme weather events, water resources and energy still have yet to be addressed. Coastal zone management, nature and biodiversity conservation have been considered in policy and planning, but have been not been implemented sufficiently.

Disaster Risk

Insufficient finance, a dearth of human resources, inappropriate institutional structures, inadequate awareness and education, low levels of communication and lack of technologies have affected adaptation to and mitigation of disaster risk. Tsunami alerts and warnings have been communicated, but organisation and mitigation measures remain limited in many local islands and resorts. Flooding is still an annual event in a number of local islands, and there is a deficiency in infrastructure to deal with and manage it. Similarly, storm surges have affected multiple islands and have caused damage to infrastructure. Water resources are a significant concern, with 80 local islands requiring annual replenishment of drinking water stores from the capital. Coastal zone management has been included in policy and planning but with limited implementation.

Waste Management

Insufficient finance, a dearth of human resources, inappropriate institutional structures, inadequate awareness and education, lack of communication and lack of technologies have affected pollution management and control, with many local islands experiencing waste management centre overflows with waste because it is too costly to transport waste to the

main waste disposal site near the capital, which has resulted in resorts nearby being affected with flies, bad odours and floating garbage.

7.4 ANTICIPATED VARIATIONS BY SECTOR

The key determinant model was developed to understand what underlying issues affect stakeholders' responses to environmental issues, and therefore it uses the data from all sector levels to get a perspective at the national level. However, it would be interesting to discuss how the model would vary if single stakeholder sectors perspectives were analysed, and what they believe affects their individual response to environmental problems. It is important to make clear that the discussion is based around the top level determinants and which determinants each sector deemed as most influential to their response. The following sectors were examined – public sector, international organisations, private sector, third/voluntary sector, and local community.

Public Sector

From the perspective of the public sector, the key determinant model would likely be affected by the inadequate motivation of the government in addressing political corruption (as lower level government representatives regarded the influence of high level political actors having a negative influence on the way government institutions were managed and were not interested in changing it and key policy makers with the authority to change things were not interested as it would dilute their political influence), the human resource situation, lack of transparency and accountability, lack of stakeholder communication, and lack of appropriate fiscal and monetary action. It is important to note that lack of stakeholder motivation and lack of stakeholder awareness and education would be expected to affect the model, but to a lesser extent than for those other stakeholders themselves.

Government institutional structure is an important capacity constraint in the country and, therefore, if the government is not willing to make changes to this structure – such as, enhancing accountability and transparency in order to remove the conditions that enable political corruption to flourish – then other capacity constraints, such as financial issues, awareness/education and communication/network of interaction, cannot be dealt with and

will continue to inhibit progress in the environmental (and other) sphere. By addressing the institutional structure of the public sector, stakeholder communication and the network of interaction with stakeholders internal and external to the public sector would be improved, civil servants would have a greater understanding of their roles and responsibilities, and the likelihood of undue political interference in department resource allocation would be reduced.

The current human resource situation has a significant influence on the ability of governmental institutions to function. If the government were willing and able to address the human resource situation in the public sector there would not only be a greater number of technically skilled staff, but there would also be a reduction in the attrition of staff, thus collectively improving the human resource situation in the sector, and increasing government's institutional capacity. However, for this to be achieved, the government would be required to take appropriate fiscal and monetary action to have the finances available so that technically qualified civil servants can be adequately remunerated, thus reducing their propensity to leave and increase their motivation to fulfil their responsibilities.

With an improved human resource situation, the government would have an improved ability to communicate project outcomes to donor agencies. But this would also require the will, skills and resources to address socially-entrenched communication problems of public sector institutional structure such as slow decision making, high level of bureaucracy, unclear job roles and mandates and influence of political actors on decision making. This could be addressed by enhancing the accountability and transparency of organisations, developing clear job roles and responsibilities (which would require a high level of communication among government departments) and developing compliance procedures so that staff adequately communicates issues.

International Organisations

The international organisations sector generally had very high interaction with the government and often relied on the government to undertake and implement projects funded by this sector. They also have some interaction with the local community and with

the third/voluntary sector, but very little with the private sector. The model when viewed at from the perspective of international organisations would therefore reflect what this sector deems to be significant determinants of action, such as: the human resource situation; lack of stakeholder communication; lack of transparency and accountability and; lack of appropriate fiscal and monetary action. Whilst, lack of stakeholder awareness/education, lack of stakeholder motivation, and political corruption were seen by this sector to have negative influences on responses to environmental issues, the data indicated that the other determinants were regarded as more significant by international organisations.

The government's unwillingness to develop the human resource situation in the country, especially when it came to the provision of local consultants, was seen by this sector as a serious barrier to responding to environmental issues; it not only affected the human resource constraints in the country, but it also affected financial capacity, since it increased the likelihood that the Maldives would find it difficult to obtain further funding.

The lack of transparency and accountability was reported by the sector to have resulted in institutional capacity constraints. This has affected the communication capacity of the country, especially when it came to providing feedback to donor agencies. The consequences of this for the Maldives were it reduced the amount of funding the donor agencies were willing and able to give the Maldives to spend on environmental issues over the next few years.

International organisations regarded inadequate fiscal and monetary action – for example, by not reducing costs – as a significant barrier to responses to environmental issues; it has led to constant borrowing to meet budget demands and increasing national debt, which has reduced the financial capacity of the country. Therefore, the government has been unable to set aside funding for projects that address environmental issues, such as adaptation, waste management and disaster risk. Moreover, the country was becoming dependent on foreign aid and loans, which is further exacerbating fiscal and monetary problems in the country.

Private Sector

The private sector has a very low level of dependency on the government, especially financially, since resorts are often located far away from the capital. In addition, the private sector often has good communication links with the tourism ministry. These factors are likely to influence their perceptions, thus have an impact on the Key Determinant Model.

From the perspective of the private sector, the model would be expected to be weighted towards the following top determinants: lack of stakeholder motivation; fiscal and monetary action, and; lack of stakeholder awareness. Other determinants, including political corruption human resource situation, lack of stakeholder communication, and lack of transparency and accountability, were mentioned by the private sector, but the data indicated that they were not considered as being particularly influential in determining responses to environmental issues.

The private sector perceived that the government were not willing to motivate the sector, for example, through the use of subsidies and tax breaks, especially when it came to overcoming technology capacity constraints, such as reducing carbon and using alternative renewable technologies. Therefore, the data indicates that the private sector felt that they had no incentives to go beyond their usual operations when responding to environmental issues.

The lack of further funding was perceived by the private sector to be a significant reason for lack of action. They reported that more funding was required in order to support the private sector in technology development for environmental management systems. They also felt that funding should be provided for the local community to deal with their waste; they reporting feeling financially burdened due to the lack of government action to support the local community in waste management, and felt it was up to them to deal with it despite government industry taxation.

The private sector also considered the lack of awareness and education, especially in the local community, as a barrier to responding to environmental issues. For example, within resorts, they had control over education and information dissemination to their customers,

however, they regarded the government as being unwilling to educate and raise awareness of the local community, an especially significant problem in waste management.

Third/Voluntary Sector

From the perspective of the third or voluntary sector, the model is likely to be weighted towards the following top determinants: lack of stakeholder awareness and education; lack of transparency and accountability; the human resource situation lack; of stakeholder communication, and; lack of appropriate fiscal and monetary action. This sector did also perceive lack of stakeholder motivation and political corruption as affecting their ability to respond to environmental issues, but according to the data, these were not as significant as the other determinants.

Because a significant amount of work done by this sector is in the form of developing the awareness and education of the local community, they perceive the government as not adequately addressing this capacity dimension. In addition, they observe there as being insufficient communication with stakeholders, which has had an impact on both awareness and education, and communication capacity constraints. This is perceived as leading to the inappropriate handling of waste in the local community, and ineffective planning for disaster risk and climate change adaptation.

The human resource situation was regarded by the sector as contributing to the exacerbating the human resource capacities and therefore affected the sectors ability to find appropriate technically qualified staff to conduct environmental projects at local community level.

Insufficient communication between this sector and the government was seen to be related to the unwillingness of government to tackle the lack of transparency and accountability within government institutions The lack of communication from the government affected the third/voluntary sectors' ability to report environmental issues in the local community that needed addressing such as waste management and flooding, the ability to access funding for local community environmental projects especially developing awareness and education and cause delays in developing and implementing projects .

Inadequate fiscal and monetary action was deemed by the third/voluntary sector to adversely impact the financial capacity of their sector, and the capacity of the local community to undertake tasks in response to environmental issues.

Local Community

From the perspective of the local community, the Key Determinant Model is likely to focus on the following determinants: the human resource situation; lack of stakeholder communication; lack of stakeholder motivation; lack of appropriate fiscal and monetary action lack of transparency and accountability, and; political corruption. Despite the fact that the local community perceives their lack of awareness and education as influencing their response to environmental issues, the data is more weighted towards the other determinants.

The lack of appropriate fiscal and monetary action by the government was regarded by the local community as resulting in a lack of funds available for the local community to invest in projects such as waste management facilities, wave breakers and drainage to combat flooding and furthermore there was a lack of microfinance and credit facilities at affordable rates of interest for small environmental projects that could be developed by the local councils.

The local community perceived that insufficient action was being undertaken to improve the human resource situation of the country; this was regarded as having an effect on human resource capacity at the local level, resulting in local community dependence on central government for technical staff. However, it was acknowledged that human resources alone would not be sufficient; the government would also need to address the fiscal and monetary situation in the country in order for there to be funds available for environmental action.

The lack of stakeholder communication was regarded as a barrier to getting things done, as the local community were dependent on the government for so many things. Therefore, when feedback from the government was slow – as was usually the case due to weak communication linkages – it affected their ability act, especially their ability to implement initiatives to enable them to adapt to and mitigate environmental issues.

The local community reported that stakeholder motivation was not being sufficiently addressed. It was perceived that the basic development infrastructure was not being provided to all local communities, and therefore these communities were not being provided with the incentives and the resources to motivate them to respond to environmental issues.

The lack of transparency and accountability was reported, by local community, as something to be resolved. It was noted that this issue influenced the institutional capacity of government institutions to respond to the needs of communities arising from environmental issues. A number argued that the policy of decentralisation should have been enforced, so that the local community could more easily hold government to account, they could be more autonomous, and they could become more empowered; this would be likely to also improve stakeholder motivation.

Political corruption was regarded by the local community has something that the government was not motivated to address, as this would require them to address transparency and accountability within government institutions. Political corruption was deemed to affect the financial capacity of the country, and in turn, the resources available for them to spend on environmental issues.

7.5 CHAPTER SUMMARY AND CONCLUSION

Government motivation can contribute to the intrinsic or extrinsic stimulus that drives a subject towards a particular goal or elicits specific actions in order to realise this goal; it therefore helps to generate certain behaviours. This chapter revealed that the motivation of the Maldives government influences their action and behaviour towards the goals it has set and values it has expressed in relation to environmental issues in the Maldives. Motivation can include political will, knowledge, strength of opinion, and the importance or prominence of that opinion in public affairs. Government motivation is a much more overarching term than political will; the former can include a varied and multidirectional set of outcomes, behaviours and actions, whereas the latter seems more unidirectional in terms of action or non-action. Government motivation leads to factors that drive desires to participate in corrupt acts, and the lack of institutional constraints allows them to fulfil this drive.

The key determinant model illustrated that stakeholders' responses to environmental issues are affected by the inadequate motivation of the government in addressing prevalent determinants, which include, political corruption; lack of stakeholder awareness and education; human resource situation; lack of stakeholder communication; lack of stakeholder motivation; lack of transparency and accountability, and; lack of appropriate fiscal and monetary action. These determinants are all affected by and all contribute to capacity issues, such as, awareness and education, technology, communication/network of interaction, human resources, financial Issues, and institutional structure. The government can influence these capacity issues for the better, but due to a lack of motivation to reduce the negative impacts of these capacity issues, stakeholders' ability to act on important environmental issues, such as climate change, disaster risk and waste management is hindered.

The model showed that determinants, when not adequately addressed, had a knock on effect on capacities and stakeholder responses; for example, appropriate fiscal and monetary action affected a number of capacity issues, including, technology, financial issues, human resources, and awareness and education, which would in turn affect stakeholders' response to environmental issues. In addition, the model also showed that these determinants affected and influenced each other; for example,, lack of adequate fiscal and monetary action also affected the lack of stakeholder motivation, as it means that there is likely to be a lack of funds for local community to implement appropriate initiatives, and a lack of tax breaks and subsidies for the private sector.

The anticipated individual stakeholder sector Key Determinant Models revealed that, although all of the prevalent determinants were mentioned by all stakeholder sectors, certain determinants were regarded as more influential by different sectors in affecting their ability to respond to environmental issues than others.

The public sector perceived political corruption, the human resource situation, lack of transparency and accountability, lack of stakeholder communication and lack of appropriate fiscal and monetary action as the most significant. International organisations felt that the human resource situation, lack of stakeholder communication, lack of transparency and accountability, and lack of appropriate fiscal and monetary action were the most influential

determinants. The private sector considered the lack of stakeholder motivation, fiscal and monetary action, and the lack of stakeholder awareness to be the dominant determinants. The third/voluntary sector viewed the lack of stakeholder awareness and education, lack of transparency and accountability, the human resource situation, lack of stakeholder communication and lack of appropriate fiscal and monetary action as most significant. Finally, the local community referred to the human resource situation, lack of stakeholder communication, lack of stakeholder motivation, lack of appropriate fiscal and monetary action, lack of transparency and accountability, and political corruption as the most influential determinants in determining responses to environmental issues.

It is important to note that the perceptions of each stakeholder group have been influenced by a number of factors, which include: their interactions with other stakeholders groups; the intensity of inter-stakeholder group relationships; the resources available, and; the functions of each sector.

CHAPTER 8 CONCLUSIONS

8.1 INTRODUCTION

This chapter concludes the findings of the research. Furthermore, the chapter explains what the research has done and how it improves our understanding of the problem. The chapter also clarifies the original contribution to knowledge and draws a comparison between the research and existing literature in relation to responses to environmental issues in SIDS. By making a comparison between the structure and findings of this thesis to relevant literature through contrasting the method, sources of data, types of stakeholders engaged, topics covered and the important findings of the research, and explain how it contributes to the existing literature. Finally it makes recommendations for further research in the field.

8.2 FINDINGS OF THE RESEARCH

Since the 1992 RIO SUMMIT, the special case of island countries was codified in Agenda 21, meaning the Agenda reflected a global consensus and political commitment at the highest level on development and environmental cooperation, and small island developing states (referred to as SIDS) were a special case within this concept (UWICED/UNDP, 2002). The UN Department of Economic and Social Affairs (UNDESA) has identified fifty one SIDS across the world (UN Division for Sustainable Development, 2009). The UN has identified several challenges to development shared by SIDS: small population, limited resources, remoteness, susceptibility to natural disasters, vulnerability to external shocks and excessive dependence on international trade (UN Division for Sustainable Development, 2009). The BPOA presents a basis of action in fourteen priority areas and indicates specific actions, policies and measures to address the challenges SIDS face; these priority areas include climate change and sea level rise, natural and environmental disasters, energy resources, tourism resources, management of waste, coastal and marine resources, land resources, national institutions and administrative capacity, bio-diversity resources, freshwater resources, transport and communication, science and technology, regional institutions and technical cooperation, and human resource management (HRM) (BPOA, 1994).

The Maldives was chosen as the context of the study as representative of other SIDS nations because it has a small population, is remote, is susceptible to external shocks, and relies on a few economic activities which include fisheries and tourism as the main industries, as well

as the researcher's previous work experience in the country. It is extremely vulnerable to the impacts of environmental issues, such as sea level rise, coastal erosion, high wave surges and increasing drought. There are a number of stakeholder groups in the Maldives who play a role in, influence and are affected by environmental issues; these include Local Community (atoll councils), Government (Ministry of the Environment, Ministry of Tourism); Private Sector (resorts, tour operators, trade associations, EIA Consultants, tourism industry suppliers, seaplane operators), international organisations (UNDP, ADB, IUCN), and Third Sector/Voluntary Organisations (NGOs, Red Crescent).

Out of the total number of fifty two SIDS, thirty six of them are small island tourism destinations, which constitute 69% of SIDS being dependent on tourism (McElroy, 2003). Tourism relies on renewable resources such as beaches, scenery, and a temperate climate amongst a number of features, without which tourism holds little economic value (Mieczkowski, 1990). The economic benefits of tourism include the following: it can improve the balance of payments; improve prospects of other sectors linked to tourism, and increase state reserves of foreign currency, job creation, tax revenues, GDP and investment (Michalic, 2002; Shareef and McAleer, 2005; Jules, 2005; Richardson, 2007).

SIDS can be environmentally vulnerable from risk of damage to their natural ecosystems from both the consequences of climate change and non-climate-related environmental issues, and they can also be economically vulnerable because of their dependence on a narrow economic base such as tourism (UN-OHRLLS, 2009; UWI, 2002). However SIDS can also be socially vulnerable due to internal and external factors that affect social cohesion and the quality and development of institutions. Institutional constraints can include poor governance and a lack of accountability which play a major role in inhibiting SIDS development (Bertram, 2006; Easterly *et al.,* 2006). Despite SIDS facing unique vulnerabilities compared to other developing states, this does not necessarily mean that they are unable to cope, react or develop their systems to deal with exogenous shocks.

Furthermore, resilience is something that SIDS may have naturally and something which they will also need to develop. A number of measures have been put forward to reduce vulnerability and increase resilience; these include climate change mitigation and adaptation; energy efficiency and renewable resources; natural disasters; trade; marine and

coastal resources; fisheries; tourism; reducing financial debt, and greening of economies (MSR 2010, pp.4-5). Resilience will depend upon the level to which the community/society is capable of organising itself and the ability to increase its capacity (UN/ISDR, 2004).

The central characteristics of capacity include the following: to act, to relate, to generate development results, to integrate, to adapt and to mitigate (Morgan, 2006; Winkler *et al.,* 2007). The capacities and their strength influence performance; however actors and their capacities are embedded in complex environments that influence their ability to carry out tasks effectively and efficiently, and achieve their objectives. Five dimensions at which capacities occur that affect capacities, and so influence actors' performance, are the action environment, the institutional context, the task network, organisations, and individuals (Hindlebrand and Grindle, 1994). A stakeholder or community may be endowed with certain capacities, and may have a number of options to tackle environmental issues.

Environmental issues such as climate change, waste and pollution have been frequently discussed and debated in the world media and have become a 'hot' topic of discourse. Climate change specifically has received particular attention due to the negative consequences of changes in surface air temperatures, precipitation, and extreme events (such as tropical storms), ocean heat content, ocean salinity, ocean pH, and sea level (Lal *et al.,* 2002; Willis *et al.,* 2004; Levitus *et al.,* 2005; Webster *et al.,* 2005; Woodworth, 2005; Ishii *et al.,* 2006; Landsea *et al.,* 2006; Bindoff *et al.,* 2007; Pielke, 2007; Trenberth *et al.,* 2007; Elsner *et al.,* 2008;; Kench *et al.,* 2009; Rahmstorf, 2009; ESCAP, 2010; Nobuhito *et al.,* 2010; Nurse and Sem, 2010; Yamamoto and Esteban, 2011). The Maldives have been very vocal about their vulnerability to Climate Change over the past twenty years, particularly the threat from sea level rise, such as in the 1992 UN Earth Summit, and in Copenhagen 2009. On both occasions it was made clear that the Maldives may lose their entire nation territory due to sea level rise.

Climate change consequences for SIDS includes the following risk areas: storm surges and floods (UNEP, 2004; Yamamoto and Esteban 2011); beach and coastal areas (Forbes and Solomon, 1997; Kench *et al.,* 2005); coral reefs (Dulvy *et al.,* 2004; Burke *et al.,* 2011); mangroves and Seagrasses (Suman, 1994; Perez *et al.,* 1999); biodiversity (McNeely *et al.,* 1993; Fish *et al.,* 2005); water resources (World Bank, 2000; Hajkowicz, 2006); agriculture

and fisheries (Blommestein *et al.,* 1996; MOHA, 2001); infrastructure and settlements (Nurse and Sem, 2001; Hay *et al.,* 2003); tourism (Hamilton *et al.,* 2005; Gössling and Hall, 2006; Deutsche Bank Research, 2008; Scott *et al.,* 2008); and health (WHO, 2003; Mimura *et al.,* 2007). Non-climate-related environmental issues faced by SIDS were identified as pollution and waste Management (MCEDAP, 2000a; UNEP, 2004; ESCAP, 2010), and tourism related environmental issues (Fagence, 1997; Honey, 1999; Dixon *et al.,* 2001; Mastny, 2001; Perrin *et al.,* 2001; Neto, 2002; McLaren, 2003, Jules, 2005; Hall, 2010).

From the literature, nine constraints and barriers to stakeholders' responses to environmental issues were identified as lack of political will (Smit and Pilifosova, 2001; Dodds, 2007; Clar *et al.,* 2012); institutional (Adger *et al.,* 2005; Storbjörk, 2010); regulatory (Argawala *et al.,* 2011; DCEE, 2011); physical environment (Berkes and Jolly, 2001; Barnett, 2005); human resources (Robinson and Gore, 2005; Burch 2010); technology (Tol *et al.,* 2006; ECLAC, 2011); financial (Aaheim and Aasen, 2008; Moser and Ekstrom, 2010); information and cognitive (Ekstrom *et al.,* 2011; Clar *et al.,* 2012), and social and network (Ford and Smit, 2004; Hinkel, 2011).

The literature showed that the response strategy of adaptation was viewed as a common and ideal response to climate change for SIDS; however it may not occur or be implemented fully for a number of reasons. There may be conditions or factors that result in adaptation being ineffective as a response to climate change (as mentioned above). Constraints and barriers in the literature were often portrayed as 'ideal world scenarios' or as 'maximum approaches' with little likelihood of being put into practice in the real world (Clar *et al.,* 2012, p.12) and barriers which are 'highly context-specific and/or difficult to overcome' are often addressed with general suggestions that may not offer much help for policy-makers (Clar *et al.,* 2012, p.16).

The research identified four specific gaps in the knowledge when examining stakeholders' responses to environmental issues. First, a lack of consideration for all relevant stakeholder groups within a single study regarding their capacity to respond to environmental issues. Second, a lack of research into how the interaction of all relevant stakeholders in a given context affects each stakeholder's individual capacity to respond to environmental issues, and how this influences the overall response. Third, although multiple causes have been put

forward to explain the inadequacy of certain stakeholders' responses to environmental issues in terms of limits and barriers, there is a distinct lack of clarity around how these various limits and barriers may interact, and so it is not possible to determine whether there are any root causes to stakeholders' capacity to respond to environmental issues - thus the overall response. This means it is difficult to offer potential solutions that will enable stakeholders and states as a whole to adequately deal with environmental issues. Fourth, there is a noticeable lack of research into all of the above issues with regards to SIDS – this is a deficit particularly in need of being filled given the environmental challenges that currently face SIDS. From these gaps in the knowledge, the research aim and objectives were developed. From which the aim of the study was to identify what affects stakeholders' ability to respond to environmental issues in a SIDS.

The research methods in this study were influenced by the aim and research objectives mentioned earlier, and the author's assumptions of reality. The ontological, epistemological, and theoretical foundations of the research adopted a subjectivist/constructionist approach finding an interpretivist paradigm as most suitable; the form of interpretivist approach to human inquiry subscribed to in this study was phenomenology. The research demanded disregarding personal viewpoints about environmental issues in favour of collecting and analysing data in ways that identify, understand, describe and maintain the subjective nature of stakeholder responses. This feature of phenomenology is highly subjective, so this paradigm is associated with qualitative methods of data collection (Eriksson and Kovalainen, 2008). The data-gathering method that most suited the research was semi-structured (Crotty, 2009, p.83).

The research design followed the example set by the ProVention Consortium (2007) – who developed the 'seven-step' model – an eight-step model is generated that details the different steps that were involved in conducting this research, and the activities in each of these steps. The steps involved were (1) selecting a framework for analysis; (2) selecting the level and units of analysis; (3) identifying stakeholders; (4) selecting appropriate forms of data to be collected; (5) selecting appropriate methods of data collection; (6) selecting appropriate methods of data analysis; (7) collecting data, and (8) analysing and reporting the findings of the data.

A case study approach enabled the researcher to explore the particularities and complexity of a single case, by reaching an understanding of its activity within the context of important circumstances (Stake, 1994, p.xi). By conducting a case study, there was great propensity to capture the complexity of the multiple experiences of a wide range of stakeholders concerning environmental issues in the tourism-dependent Maldives.

Collecting data from both stakeholder documents and stakeholder interviews ensured that the analysis and conclusions were as well-informed and all-encompassing as possible.

The KWIC was used because the main issues highlighted by stakeholders in their documents were, in effect, self-identified and thus self-evident as themes important to the case study. The KWIC enabled the development of themes that were used for interview discussion topics, not only to understand these issues in more depth, but also to understand the differing perceptions of these, establish stakeholders' actual activities within each thematic area, and compare it with what they are saying they are doing as reported in the documents.

 A grounded theory approach was employed as the method of coding and analysis because the data required much more in-depth analysis in order to develop an understanding of the relationships among categories, such as the perceptions of different stakeholders regarding environmental issues, responses to environmental issues, reasons for any inconsistencies in responses, and relationships between stakeholders and their activities and how these influenced other stakeholders' outlooks and activities. The grounded theory approach enabled themes found to be linked to an explanatory model namely *key determinant model* which helped to convey relationships between themes effectively.

This *key determinant model* showed that stakeholders' response to environmental issues were affected by the inadequate motivation of the government in addressing prevalent determinants such as political corruption, stakeholder awareness and education, human resource situation, lack of stakeholder communication, lack of stakeholder motivation, lack of transparency and accountability, and fiscal and monetary action were all affected by and contributed to capacity issues such as awareness/ education, technology, communication/ network of interaction; human resources, financial Issues and institutional structure . The

government can influence these capacity issues, but due to a lack of motivation to reduce the negative impact of capacity issues, this has hindered stakeholders' ability to act on important environmental issues such as climate change, disaster risk and waste management. The anticipated variations of the model by sector revealed that that although all the prevalent determinants were mentioned by all sector levels, some determinants were regarded as more influential by different sectors in affecting their ability to respond to environmental issues.

8.3 WHAT THE STUDY HAS DONE AND HOW IT IMPROVES OUR UNDERSTANDING OF THE PROBLEM

The lack of consideration for all relevant stakeholder groups within a single study regarding their capacity to respond to environmental issues was identified as a significant gap in research to date. This research gap was addressed by engaging with stakeholders from the public sector, international organisations, private sector, third/voluntary sector and local community. The case study approach enabled an in-depth examination of all stakeholders' ability to respond to environmental issues in the Maldives, and a broad range of evidence to be analysed, including a total of 79 documents (written by public sector, international organisations, third/voluntary sector and private sector) and 57 interviews (with members of the public sector, international organisations, third/voluntary sector and local community).

A further gap was the lack of research into how the interactions of all relevant stakeholders in a given context affects the capacity of each individual stakeholder to respond to environmental issues, and how this, in turn, influences the overall response. Generating a case study database and constructing chains of data evidence to enable the identification of similarities and differences between sectors and the links between sectors, tackled this dearth in the research. For example, government was found to be dependent on donor aid from international organisations for development projects, and international organisations were found to be dependent on government feedback to provide relevant data on project outcomes to determine whether international donors should provide future funding.

Another example from the data involves interactions between local communities and other stakeholders. Local community was found, at times, to be dependent on the government being willing and able to provide finance, human resources, and information on environmental issues. It was also found that some members of the local community had high levels of interaction with the private sector, which could develop into waste collection relationships , whereby the resort would collect local island waste and transport it to the waste collection island without any cost to the local island; however, some resorts felt that they had no option but to do this as the local island was unable to deal with their waste independently, and if nothing was done the waste from the local island tended to wash up onto the resort beach. This example evidently shows that the interaction between stakeholders affects individual capacity and behaviour in responding to environmental issues.

Research to date has been found to have a lack of clarity regarding how various limits and barriers to action may interact, and so it was not previously possible to determine whether there are any root causes to the level of capacity stakeholders have in responding to environmental issues. This study was able to tackle this gap by using a grounded theory approach to coding, which enabled the researcher to explain causal links that are too complex to ascertain through surveys and experiments.

This study was able to show, through the Key Determinant Model, how factors interact to affect the response of stakeholders to environmental issues. Seven top-level determinants – political corruption; lack of stakeholder awareness and education; human resource situation; lack of stakeholder communication; lack of stakeholder motivation; lack of transparency and accountability, and; lack of appropriate fiscal and monetary action – relate to capacity issues – awareness/education; technology; communication/network of interaction; human resources; institutional structure, and; financial issues – that have arisen or been exacerbated by government motivation, and these capacity issues have affected the response to environmental issues, including climate change, disaster risk, and waste management.

This study was able to determine that there is a root cause to stakeholders' capacity to respond to environmental issues; this root cause was identified as *government motivation,*

which, the data indicated, was the most prevalent determinant, and the most influential on, and with the greatest number of links to, all other determinants. Government motivation has resulted in a variety of multidirectional consequences, behaviours and actions that influence stakeholders' response to environmental issues. Below is a summary of how government motivation interacts with the other top-level determinants, and how this impacts other stakeholders.

Stakeholder motivation to respond to environmental issues was significantly influenced by government motivation, because of the high level of interaction government had with different stakeholder sectors, and because it sets environmental and related policy. The motivation of local community in particular is influenced by government motivation, as local community is dependent on the government for a number of resources, such as finance, technology and human resources, which, if the government is motivated to provide access to these for the local community, the latter is more likely to be motivated to take environmentally related action. The government also has an influence on the private sector, especially resorts; the lack of financial incentives to resorts was cited as a reason for the private sector's lack of motivation to do more in terms of environmental management and supporting the local community with waste management issues. International organisations were motivated to provide development finance if the government were willing and able to provide sufficient feedback and data regarding project outcomes.

The awareness and education determinant was also strongly influenced by government motivation. Although the government, in their documentation, has identified the need to develop awareness and education, this has not meant that it has been undertaken effectively in reality. All stakeholders acknowledged the need for awareness and education, with some actively involved in the provision of it; the third/voluntary sector and some individuals in the private sector have been involved in local community awareness projects. However, all stakeholders felt that the government was not doing enough to tackle awareness and education in relation to environmental issues. The lack of government motivation to tackle environmental awareness and education led to a shortfall in, and exacerbated, the country's awareness and education capacity.

Inappropriate financial and monetary action was deemed by stakeholders to influence capacity issues in the country. The government was reported to be highly influential when it came to financial matters at the national level as they set the budget with parliamentary approval, decide how this budget is spent, and collect and set tax rates. Stakeholders perceived government financial action as being ineffective, and saw this as hindering the response to environmental issues in the country for a number of reasons. Lack of finance hinders the local community's environmental actions, especially as they are dependent on central government for funding for local projects. The private sector were found to be less dependent on government finance, but they felt that there was little financial incentive for them to invest in environmental management systems. International organisations revealed that the government's lack of motivation to implement and verify donor funded projects affected future funding by donor agencies.

The lack of transparency and accountability, which persists due to a lack of government motivation to promote and implement reforms to ensure transparency and accountability, had an impact on the institutional capacities of the country to respond to environmental issues because institutions suffered from political influence, unclear job roles and mandates, lack of communication between departments and corrupt actions were not held up to account such as finances going missing from certain departments. This resulted in other stakeholders' such as the local community not having sufficient funding for climate change and disaster risk projects. Furthermore environment projects implemented by third/voluntary sector became delayed due to the lack of funds, slow communication due to government institutions being unsure of responsibilities about which department or individual had the authority to make decisions. Furthermore, stakeholders perceived that existing social, institutional and political barriers would hinder the implementation of new viable technologies which was recognised by the government as an essential aspect of building capacity in the Maldives.

The lack of stakeholder communication was reported by stakeholders to be influenced by the government's motivation to communicate; this was partly influenced by access to resources, for example, some interaction with international donor organisations provided an avenue to access funds for development projects. The government did communicate certain information to stakeholders, such as, laws and regulations, especially those on

taxation. It was revealed that due to a lack of horizontal communication within government departments, insufficient communication was being delivered to staff, especially in relation to changes in department roles, responsibilities and staff. The impact of the lack of communication exacerbated the communication capacity constraints resulting in the local community often waiting for feedback from government regarding environmental issues they had reported such as waste and erosion problems and often awaiting months for an official reply. The third/voluntary sector sometimes found it difficult to obtain the right permissions for project implementation due to slow communication from the government. International organisations experienced inadequate government feedback regarding environmental projects they had funded.

Government motivation was also found to have a significant influence on the human resources situation of the Maldives. The lack of local technical staff had a significant impact on the implementation, measuring, reporting and verifying of development projects, as noted by international organisations. The government was given the opportunity to develop a pool of local technical staff, known as OPP (Office of Programmes and Projects), which they could then use for donor-funded projects and it would reduce the dependence on costly expatriate consultants, but no action was taken. Furthermore, the government was deemed as being unwilling and unable to develop the human resources at the local community level to reduce the dependence on central government staff, and were regarded as not providing acceptable wages for the skill level of their staff, resulting in a high rate of attrition in government institutions.

Government determination to tackle corruption was reported by stakeholders and in documentation to be influenced by the political agenda and by political actors, hence the motivation of government. The respondents from the government identified that political parties, MPs and local councillors influenced how funds were spent. Those heading government departments responsible for allocating resources were often personally related to a political party. The government institutional structure enabled corruption to flourish due to the lack of transparency and accountability. Political corruption was said to affect financial issues in the country, as discretionary government spending affected the public finances and the funds available for developmental and investment needs.

As demonstrated above, government motivation was found to be the most significant determinant of all the other determinants, capacity issues, and, therefore, the response to environmental issues. Government motivation can contribute to the intrinsic or extrinsic stimulus that drives a subject towards a particular goal or elicits specific actions in order to realise this goal; it therefore helps to generate certain behaviours. Motivation can include political will, knowledge, strength of opinion, and the importance or prominence of that opinion in public affairs. Moreover, motivation is a more overarching term than political will; the former can include a varied and multidirectional set of outcomes, behaviours and actions, whereas the latter seems more unidirectional in terms of action or non-action. Government motivation leads to factors that drive desires to undertake corrupt acts, and a lack of institutional constraints allows them to fulfil this drive.

Government motivation can depend on the subject wanting and choosing certain behaviours. In the context of this study, government motivation relates to the goals set and values expressed by government in documentation and through interviews regarding the response to environmental issues in the Maldives, and whether actual behaviours and actions conform to what is required to reach these goals and values. The Key Determinant Model shows that if the government were motivated to act on top-level determinants, this would result in a chain reaction in actions and outcomes, which would lessen capacity constraints. By addressing capacity constraints, stakeholders' ability to respond to environmental issues would be greatly improved. Therefore, if the government is motivated to create the right economic conditions, provide the financial support, enable accountability and transparency of its structures, develop horizontal and vertical channels of communication, and enhance awareness and education of all sectors, not only will the capacity barriers that stakeholders face be reduced, but the stimulus for stakeholders to take action will be generated.

When consideration was given to what the Key Determinant Model would be like if it were created using the perspective of each stakeholder sector individually, it was revealed that every stakeholder sector mentioned, and reported to be affected by, all of the prevalent determinants; however, certain determinants were regarded as more influential by different sectors in affecting their ability to respond to environmental issues than others. International organisations and the third/voluntary sector put greater weight on

communication, awareness and education, lack of transparency and accountability, and the human resource situation in influencing environmental action compared to the private sector, who emphasised the lack of appropriate fiscal and monetary action (which was also emphasised by the third/voluntary sector), and lack of stakeholder motivation (as well as lack of awareness) as more important; local community was found to emphasise all of these factors, as well as political corruption, as did the public sector, except for stakeholder awareness and stakeholder motivation, which it did not find as important. However, it is important to note that the perceptions of each stakeholder group have been influenced by a number of factors, which include: their interactions with other stakeholders groups; the intensity of inter-stakeholder group relationships; the resources available, and; the functions of each sector.

8.4 CONTRIBUTION TO KNOWLEDGE

The original contribution to knowledge of this study is its addition of the perspective of a variety of stakeholders in the Maldives to the wider debates about environmental issues in SIDs. In particular, the Key Determinant Model contributed to knowledge by providing the perspectives at national and sector levels about what determinants are deemed the most significant in influencing response to environmental issues. In addition, the model contributed to knowledge by helping to understand the relationships between government motivation, determinants, capacity issues, environmental issues and stakeholders. Furthermore, the study contributed to knowledge by improving the understanding of the interaction between stakeholders, the power dynamics, and the level of communication at different sector levels and within sectors. Because the study was undertaken with the Maldives as the case study, it was able to acquire a significant insight into the issues specific to the Maldives and therefore provide a variety of perspectives of stakeholders who influence society and the economy of the Maldives. By having an understanding of what these stakeholders deem as the most significant barriers to in their response to environmental issues it provides information that can be used as a comparison to what other studies have found in their studies of SIDS response to environmental issues, to see whether there are similarities and differences and how this study further contributes to knowledge and literature.

8.4.1 Comparison and Contribution to Literature

Methods, sources of data, types of stakeholders engaged with, topics covered and the important findings of this research are compared with 19 other papers see table 8.1 below.

TABLE 8.1: Overview of Previous Studies in Relation to SIDS' Responses to Environmental Issues

Document		Thesis	Barnett (2001)	Byrne & Inniss (2002)	Colmenares et al., (2002)	Heileman et al., (2002)	Maharaj (2002)	Turnbull (2003)	Belle & Bramwell (2004)	Gillespie (2004)	Tompkins & Adger (2004)	Tompkins (2004)	Becken (2005)	Roper (2005)
Method	Qualitative	X	X	X	X	X	X	X	X	X	X	X	X	X
	Quantitative	X							X				X	
	Other Method(s)													
Sources of Data	Document	X	X	X	X	X	X			X	X	X	X	X
	Interview	X							X			X	X	
	Web	X	X	X	X	X				X	X	X	X	X
	Other Source(s)						X						X	
Stakeholders Engaged through Interview	Government	X							X			X		
	International Organisations	X												
	Private Sector	X							X				X	
	Third Sector	X												
	Local Community	X												
	Other Stakeholder(s)													
Topics	Climate Change	X	X	X	X	X	X		X	X	X	X	X	X
	Disaster Risk	X	X	X	X	X	X		X	X	X	X	X	X
	Waste Management	X			X	X						X		X	X
	Adaptation and Mitigation	X	X	X	X	X	X		X	X	X	X	X	X
	Political Corruption	X												
	Awareness & Education	X	X	X	X	X	X	X	X	X	X	X	X	X
	Technology	X	X	X	X		X	X		X	X		X	X
	Communication & Network of Interaction	X	X	X	X	X			X	X	X	X		X
	Institutional Structure	X	X		X	X		X	X	X	X	X		X
	Human Resources	X	X		X	X		X		X		X		X
	Stakeholder Motivation	X		X	X	X	X	X	X	X	X	X	X	X
	Financial Situation	X	X		X	X	X			X			X	X
	Other Topic(s)		X	X	X	X			X	X	X	X	X	X
Important finding(s)	*Government Motivation	X	X	X		X		X	X	X		X	X	X
	Other findings(s)	X	X	X	X	X	X		X	X	X		X	X

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Document		Thesis	Schipper & Pelling (2006)	Mercer et al., (2007)	Singh, & Mee (2008)	Kelman & West (2009)	Nunn (2009)	Chasek (2010)	Zubair et al., (2011)
Method	Qualitative	X	X	X	X	X	X	X	X
	Quantitative	X							
	Other Method(s)								
Sources of Data	Document	X	X	X	X	X	X	X	X
	Interview	X							X
	Web	X	X	X	X	X	X	X	
	Other Source(s)								
Stakeholders Engaged	Government	X							X
	International Organisations	X							
	Private Sector	X							X
	Third Sector	X							
	Local Community	X							
	Other Stakeholder(s)								
Topics	Climate Change	X	X	X	X	X	X	X	
	Disaster Risk	X	X	X	X	X	X	X	
	Waste Management	X			X		X	X	X
	Adaptation and Mitigation	X	X	X	X	X	X	X	X
	Political Corruption	X							
	Awareness & Education	X	X	X	X	X	X	X	X
	Technology	X			X		X	X	X
	Communication & Network of Interaction	X	X	X	X	X	X	X	X
	Institutional Structure	X	X	X	X	X		X	X
	Human Resources	X		X		X	X	X	X
	Stakeholder Motivation	X	X		X	X	X	X	X
	Financial Situation	X	X		X	X	X	X	
	Other Topic(s)		X	X	X		X	X	X
Important Finding(s)	*Government Motivation	X	X		X	X	X	X	X
	Other findings(s)		X	X	X	X	X	X	X

*Literature may not explicitly state 'Government Motivation'; however, based on the author's definition of these terms as shown above, it is therefore assumed as implied.

The examination of 19 research papers (Barnett, 2001; Byrne and Inniss, 2002; Colmenares *et al.,* 2002; Heileman *et al.,* 2002; Maharaj, 2002; Turnbull, 2003; Tompkins and Adger 2004; Belle and Bramwell 2004; Gillespie, 2004; Tompkins, 2004; Becken, 2005; Roper, 2005; Schipper and Pelling 2006; Mercer *et al.,* 2007; Singh & Mee, 2008; Kelman & West,

2009; Nunn, 2009; Chasek, 2010; Zubair *et al.,* 2011), and their themes, content and research methods, when compared to this study were found to have a number of the same topics. Furthermore, the analysis and comparison revealed that most made reference to government motivation (based on the author's definition of motivation mentioned in this chapter). This research is given a significant amount of validity due to the fact that a large number of the research papers analysed and compared with it highlight the influence of government motivation on states' response to environmental issues.

None of these papers, however, were found to have examined data to the same extent as this research project, in terms of the number and types of documents (such as academic literature, and institutional and policy documents) or the number and types of stakeholders that produced them. In addition, the extent of stakeholder engagement through interviews in this research (government, private sector, international organisations, third/voluntary sector and local community) was unrivalled.

This research goes much further than the 19 documents reviewed because, in addition to establishing that government motivation plays a predominant role in the adequacy of the states' response to environmental issues – as most of the other research papers do – it also analyses the causal chains that lead from governmental motivation, to certain capacity issues, and then to the adequacy of the response, and also identifies and analyses how these causal chains affect other stakeholders, and shapes their response (or lack of it) to environmental issues – factors that the other research papers fail to examine. This research has shown a more comprehensive method to understanding the Maldives' response to environmental issues than any of the other research papers have done in relation to the context in which their studies are based.

8.5 RECOMMENDATIONS FOR FURTHER RESEARCH

Although the Key Determinant Model was developed specifically for responses to environmental issues in the Maldives, it could be applied beyond these issues to examine topics such as social problems, for example, drugs and gang violence, in order to identify the prevalent determinants that affect stakeholders' responses to these issues, and what specific stakeholders perceive as the most significant barriers to constructive action.

There is also the potential to extend this research beyond the context of the Maldives to examine responses to environmental issues in other SIDS, especially SIDS that have similar topographical characteristics to the Maldives (flat island coral archipelagos, such as the Marshall Islands (highest point 10m above sea level), and Tuvalu (highest point 5m above sea level)). Furthermore, research could be conducted that involves the comparison of sovereign SIDS and SIDS that belong to larger countries, in order to investigate whether there are any differences in the limits and barriers and the root cause(s) between them.

There is scope for examining at the international level, in terms of global responses, the determinants that affect developing countries' ability to access finance, and technical and other support to respond to climate change; whether it is a case that developed nations are unmotivated, unable or otherwise to provide these resources. This would provide an insight into the interactions developing countries have with donor agencies and countries in relation to broad environmental problems, the perspectives of donors about the reasons affecting the support they provide to developing countries for action on environmental issues, as well as the differences and similarities in the barriers faced by developing countries in obtaining international support for climate change action. .

It may also be possible to extend the current research to the responses of developed countries to environmental problems, such as climate change, where they are the biggest contributors but a majority of their climate change adaptation and mitigation activities are conducted at a location other than their national territories.

The case study approach adopted for this study enabled a number of aspects to be analysed within the context of the Maldives, including all relevant stakeholders, the interactions of stakeholders and how this affects their response, the interactions of limits and barriers to responses, and the identification of a root cause. This approach allowed multiple sources of data to be analysed at a number of different levels, which this has implications for further research in industry. For example, this research design could be tailored to the banking industry of a specific country to examine what affects stakeholders' capacities to change the current structure of the banking industry, and determines whether this course of action is pursued (banking has become a 'hot' topic of discourse and has a significant effect on the world economy, most recently the 2008 recession and libor rate fixing).

This could be investigated by accessing documents produced by relevant sectors, such as the bank regulators, government, the banks themselves, amongst others, and identifying what the key themes or issues are within these documents, and the differences and similarities between stakeholder documents. The relevant stakeholders would then be interviewed about the key themes and issues revealed in the documents, and any new insights from the interview data would be identified. Finally, the combined data from the documents and interviews would be analysed in order to reveal the interactions of stakeholders and how these interactions affect their responses, the interactions of limits and barriers to action and whether there exists any root cause(s) of these limits and barriers. A further development would be to analyse the differences and similarities between sectors about their perceptions of the most influential limits and barriers to banking structure reform, which, depending on the dominant sectors and stakeholders, could contribute to an understanding of why banking reform has not happened yet.

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APPENDICES

APPENDIX 1: LIST OF THE SELECTED DOCUMENTS

Appendix 1.1: Government

Name	Date	Source	Context
(1)First National Communication of the Republic of Maldives to the united nations framework convention on climate change	2001	Government of Maldives	UNFCCC Submission
(2) First national report to the conference of the parties to the convention on biological diversity.	2002	Government of Maldives	Report for Conference of Parties
(3) Environmental Protection	2006	Government of Maldives	Factsheets
(4) Regulation on the Protection and Conservation of Environment in the Tourism Industry	2006	Government of Maldives	Regulations
(5) National Adaptation Programme of Action (NAPA) Maldives	2007	Government of Maldives	National Adaptation Program of Action
(6) Maldives 3rd Tourism Master Plan. National Framework for Development 2007-2011	2007	Government of Maldives	National Framework for Development
(7) Capacity Development Action Plan. National Capacity Self-Assessment Integrated Climate Change Strategy Projects	2008	Government of Maldives	National Capacity Development Action Plan Maldives
(8) Environmental & Social Assessment Framework	2008	Government of Maldives	Maldives Environmental Management Project related to Waste Management
(9)Integrating Tourism into Adaptation to Climate Change in the Maldives	2008	Government of Maldives	Integrating Tourism into Adaptation to Climate Change in the Maldives
(10) Policy Brief on Governance and integrated Coastal Management Maldives.	2008	Government of Maldives	Under the guidance of Mangroves For the Future preparatory programme
(11) Maldives National Capacity Self-Assessment Report and Action Plan for Global Climate Change,	2009	Government of Maldives	Environment

Name	Date	Source	Context
Biodiversity and Land Degradation Conventions			
(12)Strategic Action Plan: National framework for development Maldives 2009-2013	2009	Government of Maldives	National Framework for Development
(13) National Adaptation to Climate Change	2009	Government of Maldives	Produced for the Maldives Partnership Forum
(14) Third-National-Environment-Action-Plan 2009-2013	2009	Government of Maldives	Environment
(15)Maldives National Strategy for Sustainable Development	2009	Government of Maldives	Development Strategy
(16) Millennium Development Goals Maldives Country Report	2010	Government of Maldives	Progress Report of MDGs Maldives
(17) Strategic National Action Plan 2010-2020	2010	Government of Maldives	For disaster risk reduction and Climate change adaptation
(18) Maldives national assessment report	2010	Government of Maldives	Environment
(19) Coastal Monitoring, Reef Island Shoreline dynamics and management implications	2010	Government of Maldives	Coastal erosion
(20) User Pays Framework for Island Waste Management Services	2010	Government of Maldives	User Pay Framework
(21) State of the Environment Maldives	2011	Government of Maldives	Key Environmental challenges
(22) National progress Report on the implementation of the Hyogo framework for action 2009-2011	2011	Government of Maldives	National Disaster management Centre Report
(23) Technology transfer for promoting 3Rs . Adapting, Implementing and scaling up appropriate Technologies. Country Analysis Paper Maldives. Reduce, Reuse and Recycle	2011	Government of Maldives	Country analysis Paper prepared for the Third Meeting of the Regional 3R Meeting
(24) Framework for an Ecosystem-based Management Plan Addu Atoll, Republic of Maldives.	2011	Government of Maldives University of Queensland Australia	Developed as an output from the Capacity Building ecosystem-based approaches for coastal areas and reefs

Appendix 1.2: Third/Voluntary Sector

Name	Date	Source	Context
(1)Observations of reef conditions on central Maldives reefs	2005	Maldives Scuba Tours/Marine Conservation Society	Reefs central Maldives
(2)Environmental Information	2012	Blue Peace Maldives NGO	A variety of Environmental Information
(3)Programme Information	2012	Live and Learn Maldives Environmental Education NGO	A variety of Programme information
(4) A Regional Synthesis Of Results and Lessons from Mangroves For The Future Small Grants Projects : 2009 -2011 MFF , MFF Secretariat	2012	NGO Mangroves for the future.	Project Findings
(5) Concept Paper for the Private Sector Engagement Initiative Workshop, Mangroves for the Furture Programme Maldives — Aminath Mihdha	2012	NGO Mangroves for the future.	Role of Private Sector
(6) MFF Maldives NSAP — MFF Maldives , MFF	N.D.	NGO Mangroves for the future.	National Strategy and Action Plan NSAP
(7) Establishing a waste disposal site — MFF , IUCN	2011	NGO Mangroves for the future.	Waste Disposal
(8) Environmental awareness media project — MFF , IUCN	2009	NGO Mangroves for the future.	Environmental Awareness
(9) A print media awareness campaign to protect mangrove habitats in the Maldives — MFF , IUCN	N.D.	NGO Mangroves for the future.	Media and Awareness
(10) Strengthening the waste management system on Noonu Manadhoo Atoll and greening the island — MFF , IUCN	2009	NGO Mangroves for the future.	Waste Management
(11) Increasing awareness about waste management — MFF , IUCN	2010	NGO Mangroves for the future	Awareness and Waste Management
(12) Tsunami Recovery programme Maldives	2010	Red Cross	American Redcross Report

Appendix 1.3 International Organisations

Name	Date	Source	Context
(1)Key Environmental Issues: management of solid waste and sewage	2002	UNEP	Waste Management
(2) Tsunami Recovery and Impact Joint Needs Assessment	2005	Asian Development Bank (ADB), UN & World Bank	Tsunami Impact Assessment
(3) Developing a disaster risk profile for	2006	UNDP	Risk Analysis of Maldives

Name	Date	Source	Context
Maldives		RMSI	
(4) A rapid assessment of perceptions into environmental management in the Maldives	2006	ADB/Live and Learn	Local Community Perspectives
(5)Outcome Evaluation. Country Programme Maldives 2003-2007	2007	UNDP	UNDP report on Maldives
(6)Validation of the Country Strategy Program Completion Report	2007	ADB/OED	Country Strategy Completion Report
(7)Maldives Environment Assessment	2007	ADB	Country Environment Assessment
(8)Trade Policy Review of Maldives	2009	World Trade Organisation	WTO Report on Maldives
(9)Valuing Bio-diversity the economic case for bio-diversity conservation in the Maldives	2009	Eco-systems & Livelihoods Group Asia. International Union for the Conservation of Nature (IUCN) for the Atoll Eco-system Project (AEC). Ministry of Housing Transport and Environment Maldives	Report produced for the AEC Project by the IUCN
(10)Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives	2009	UNDP Maldives & Government of Maldives	Report on mitigation measures undertaken on 3 islands in the Maldives
(11) Integrating climate change risks into resilient island planning in the Maldives	2009	UNDP	Project document
(12) Climate Change and education Maldives	2010	UK Aid/ P.K. Das	Country Report
(13) Public Private Partnership Success Stories Maldives Solid Waste	2011	PPAIF Public Private Infrastructure Advisory Facility ; International Finance Corporation World Bank	Overview of a Public-Private Partnership relating to Solid waste Maldives
(14) Marine Energy in the Maldives. Pre-feasibility report on Scottish support for Maldives Marine Energy Implementation	2011	Centre for Understanding Sustainable Practice. Robert Gordon University Aberdeen. Scottish Government	Pre-feasibility report
(15) Capacity Development of the Maldives Energy Authority	2011	ADB	Technical Assistance Report
(16) Localizing Climate Change Scenarios for the Maldives	2012	The Regional Integrated Multi-Hazard Early	RIMES Project Information

Name	Date	Source	Context
		Warning System (RIMES)	
(17) Environment and Energy UNDP Maldives	2012	UNDP Maldives (online)	UNDP stance on Environment and Energy in the Maldives
(18) UNDP and Government Sign Project to Increase Resilience of Tourism Sector to Climate Change	2012	UNDP Maldives (online)	UNDP and Maldives Government joint project

Appendix 1.4: Private Sector

Name	Date	Source	Context
(1)Corporate Social Responsibility Report	2010	Kuoni	Tour Operator CSR Report
(2)Sustainability Report	2010	Thomas Cook	Tour Operator Sustainability Report
(3)TUI Sustainable Development Report	2010	TUI	Tour Operator Sustainable Development Report
(4) Guidelines for Environmental Sustainability in Hotels	2010	TUI	Hotel Gudelines
(5)Thompson Sustainable Holiday Futures Report	2010	Thompson	Tour Operator Sustainable Holiday Futures Report
(6) Coastal pollution loading and water quality criteria Maldives	2010	Seamarc	Bay of Bengal Large Marine Eco-System Project
(7) Coral Reefs Maldives	2012	Marine Conservation Society	Information
(8) Green Philosophy	2012	Adaaran Resorts Maldives (F)	Policy and Projects
(9) Slow Life	2012	SonevaFushi Resort Maldives (F)	Policy and Projects
(10) The Coral Adoption Programme at Anantara Kihavah Villas	2012	Anantara Resorts Maldives (F)	Policy and Projects
(11) Banyan Tree Maldives Marine Lab, Vabbinfaru	2012	Angsana Resort Ihuru (F)	Policy and Projects
(12) Marine Discovery Centre	2012	Four Seasons Resort Landaa Giraavaru (F)	Policy and Projects
(13) Banyan Tree Maldives Marine Lab	2012	Banyan Resort Maldives	Policy and Projects

Name	Date	Source	Context
Vabbinfaru		Vabbinfaru (F)	
(45) Centara Sustainability Vision and Policy	2012	Centara Resorts Maldives (F)	Policy and Projects
(15) Marine Research centre	2012	Baros Island Resort Maldives (L)	Policy and projects
(16) Environment Management Policy and Community Report	2012	Meerufenfushi Resort Maldives (L)	Policy and Projects
(17) Environment Management Policy and Community Report	2012	Vilamendhoo Resort Maldives (L)	Policy and Projects
(18) Environment	2012	Kuramathi Resort Maldives (L)	Policy and Projects
(19) Environment Credentials	2012	Reethi Beach Resort Maldives (L)	Policy and Projects
(20)Wet Lab	2012	Velassaru Resort Maldives (L)	Policy and Projects
(21) Green Economy: we are included, are You?	2012	Villa Hotels Maldives (L)	Policy and Projects

(F) Franchised to Foreign Management/Significant Foreign Ownership

(L) Non-Franchised/Significant Local ownership

APPENDIX 2: RESULTS OF KEY WORDS IN CONTEXT (KWIC) ANALYSIS

Appendix 2.1: Environment

Key Word/Theme	Stakeholder/Document/Frequency of theme
Environment	<u>Government</u> Capacity Development Action Plan. National Capacity Self-Assessment Integrated Climate Change Strategy Projects (2008) (4 references); Coastal Monitoring, Reef Island Shoreline dynamics and management implications (2010) (21 references); Environmental Protection Factsheets (2006) (33 references); First National Communication of the Republic of Maldives to the united nations framework convention on climate change (2001) (40 references); First national report to the conference of the parties to the convention on biological diversity (2002) (38 references); Framework for an Ecosystem-based Management Plan Addu Atoll, Republic of Maldives (2011) (14 references); The Strategic Action Plan national Framework for Development 2009-2013 (2009) (40 references); Maldives 3rd Tourism master plan 2007-2011 (2007) (38 references); Maldives national assessment report (2010) (36 references); Maldives National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) (37 references); Maldives national Strategy for sustainable development (2009) (23 references); Millennium Development Goals Maldives Country Report (2010) (26 references); Integrating Tourism into Adaptation to Climate Change in the Maldives (2008) (29 references); State of environment Maldives (2011) (41 references); National Adaptation Program of Action (2007) (38 references); National Adaptation to Climate Change (2009) (18 references); National progress Report on the implementation of the Hyogo framework for action 2009-2011 (2011) (10 references); Policy Brief on Governance and integrated Coastal Management Maldives (2008) (9 references coded); Solid Waste Management Regulatory framework (2010) (36 references); Strategic national action plan for disaster risk reduction and

Key Word/Theme	Stakeholder/Document/Frequency of theme
	climate change adaptation 2010-2020 (2010) (39 references); Technology transfer for promoting 3Rs. Adapting, Implementing and scaling up appropriate Technologies (2011) (7 references); Third-National-Environment-Action-Plan 2009-2013 Maldives (2009) (32 references); Environmental & Social Assessment Framework (2008) (30 References); User Pays Framework for Island Waste Management Services (2010) (10 References);
Environment	<u>International Organisations</u> ADB Capacity Development of the Maldives Energy Authority (2011) (8 references); ADB Maldives Environment-Assessment (2007) (13 references); ADB OECD Validation of the Country Strategy Program Completion Report (2007) (8 references); ADB Tsunami Recovery and Impact Joint Needs Assessment (2005) (10 references); UK AID Climate Change and Education Maldives (2010) (30 references) IUCN Valuing Bio-diversity the economic case for bio-diversity conservation in the Maldives (2009) (39 references); Management of solid waste and sewage Maldives (2002) (10 references); Marine Energy in the Maldives - final main report (2011) (13 references); UNDP Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009) (33 references); UNDP developing a disaster risk profile for Maldives (2006) (10 references); A rapid assessment of perceptions into environmental management in the Maldives (2006) (30 references); UNDP Integrating climate change risks into resilient island planning in the Maldives (2009) (34 references); UNDP Outcome Evaluation. Country Programme Maldives 2003-2007 (2003) (41 references); WTO Diagnostic Trade Integration Study Maldives (2006) (22 references); WTO Draft Report of Diagnostic Trade Integration Study of Maldives (2005) (7 references); WTO Trade Policy Review of Maldives (2010) (5 references);
Environment	<u>Private Sector</u>

Key Word/Theme	Stakeholder/Document/Frequency of theme
	Adaaran (2012) (2 references);
	Anantara (2012) (3 references);
	Banyan Tree Vabbinfaru (2012) (4 references);
	Baros (2012) (4 reference);
	Centara (2012) (4 references);
	Four Seasons Landaa Giraavaru (2012) (8 references);
	Kuramathi (2012) (9 references);
	Reethi Beach (2012) (8 references);
	Sonevafushi (2012) (16 references);
	Sustainability Policy Meeru and Vilamendhoo (2012) (14 References);
	Villa hotels (2012) (5 references);
	Coastal pollution loading and water quality criteria Maldives (2010) (38 references);
	Kuoni Corporate Social Responsibility (2010) (14 references);
	Thomas Cook Sustainability Report (2010) (35 references);
	Thompson Sustainable Holiday Futures Report 2010 (15 references);
	TUI Guidelines for Environmental Sustainability in Hotels (2010) (20 references);
	TUI Sustainable Development Report (2010) (19 references);
Environment	<u>Third/Voluntary Sector</u>
	MFF. A print media awareness campaign to protect mangrove habitats in the Maldives (ND) (3 references);
	MFF. A Regional Synthesis Of Results and Lessons from Mangroves For The Future Small Grants Project 2009-2011 (2012) (32 references);
	Blue Peace Maldives (2012) (15 references);
	MFF Maldives NSAP (N.D.) (18 references);
	American Redcross (2012) (3 references);
	MFF. Strengthening the waste management system on Noonu Manadhoo Atoll and greening the island (2009) (3 references);
	Live and Learn Maldives (2012) (12 References);
	MFF. Establishing a waste disposal site (2011) (3 References);
	Observations of reef conditions on central Maldives reefs (2005) (15 References);

Appendix 2.2: Climate Change

Key Word/Theme	Stakeholder/Document Source/ Frequency of theme
Climate Change	Government A rapid assessment of perceptions into environmental management in the Maldives (2006) (36 references); Capacity Development Action Plan. National Capacity Self-Assessment Integrated Climate Change Strategy Projects (2008) (9 references); Coastal Monitoring, Reef Island Shoreline dynamics and management implications (2010) (77 references); Environmental Protection Factsheets (2006) (10 references); First National Communication of the Republic of Maldives to the united nations framework convention on climate change (2001) (356 references); First national report to the conference of the parties to the convention on biological diversity (2002) (22 references); Framework for an Ecosystem-based Management Plan Addu Atoll, Republic of Maldives (2011) (9 references); The Strategic Action Plan national Framework for Development 2009-2013 (2009) (38 references); Maldives 3rd Tourism master plan 2007-2011 (2007) (7 references); Maldives national assessment report (2010) (36 references); Maldives National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) (42 references); Maldives national Strategy for sustainable development (2009) (34 references); Millennium Development Goals Maldives Country Report (2010) (39 references); Integrating Tourism into Adaptation to Climate Change in the Maldives (2008) (40 references); State of environment Maldives (2011) (60 references); National Adaptation Program of Action (2007) (45 references); National Adaptation to Climate Change (2009) (38 references); National progress Report on the implementation of the Hyogo framework for action 2009-2011 (2009) (26 References); Policy Brief on Governance and integrated Coastal Management Maldives (2008) (3 references); Strategic national action plan for disaster risk reduction and climate change adaptation 2010-2020 (2010) (57 references); Third-National-Environment-Action-Plan 2009-2013 Maldives (2009) (42 references);
Climate Change	International Organisations ADB Capacity Development of the Maldives Energy Authority (2011) (9 References); ADB Maldives Environment-Assessment (2007) (20 References);

Key Word/Theme	Stakeholder/Document Source/ Frequency of theme
	ADB OECD Validation of the Country Strategy Program Completion Report (2007) (4 References); ADB Tsunami Recovery and Impact Joint Needs Assessment (2005) (5 References); UK Aid Climate Change and Education Maldives (2010) (43 References); IUCN Valuing Bio-diversity the economic case for bio-diversity conservation in the Maldives (2009) (14 References); Marine Energy in the Maldives (2011) (8 References); PPIF IFC Maldives Waste (2011) (2 References); RIMES Localizing Climate Change Scenarios for the Maldives (2012) (25 References); UNDP Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009) (55 References); UNDP developing a disaster risk profile for Maldives (2006) (20 References); UNDP Integrating climate change risks into resilient island planning in the Maldives (2009) (59 References); UNDP Outcome Evaluation. Country Programme Maldives 2003-2007 (2007) (30 References); WTO Diagnostic Trade Integration Study Maldives (2006) (14 References); WTO Draft Report of Diagnostic Trade Integration Study of Maldives (2005) (References 2 References); WTO Trade Policy Review of Maldives (2010) (4 References);
Climate Change	Private Sector Kuoni Corporate Social Responsibility (2010) (19 references); Thomas Cook Sustainability Report (2010) (26 references); Thompson Sustainable Holiday Futures Report (2010) (24 references); TUI Guidelines for Environmental Sustainability in Hotels (2010) (12 references); TUI Sustainable Development Report (2010) (15 references); Banyan tree Vabbinfaru (2012) (1 reference); Reethi Beach (2012) (4 references); Sustainability Policy Meeru & Vilamendhoo (2012) (4 references); Coastal pollution loading and water quality criteria Maldives (2010) (10 references);
Climate Change	Third Sector/Voluntary A Regional Synthesis Of Results and Lessons from Mangroves For The Future Small Grants Project 2009-2011 (2012) (39 references); MFF. Concept Paper for the Private Sector Engagement Initiative Workshop, Mangroves for the Future Programme (2012) (2 references); Observations of reef conditions on central Maldives reefs (2005) (2

Key Word/Theme	Stakeholder/Document Source/ Frequency of theme
	references); MFF. Environmental awareness media project (2009) (6 references); MFF. Establishing a waste disposal site (2011) (2 references); Live and Learn Maldives (2012) (12 references); MFF Maldives NSAP (N.D) (29 references);

Appendix 2.3: Adaptation and Mitigation

Key Word/Theme	Stakeholder/Document Source/Frequency of theme
Adaptation and Mitigation	<u>Government</u> Capacity Development Action Plan. National Capacity Self-Assessment Integrated Climate Change Strategy Projects (2008) (1 reference); Coastal Monitoring, Reef Island Shoreline dynamics and management implications (2010) (7 references); First National Communication of the Republic of Maldives to the united nations framework convention on climate change (2001) (24 references); First national report to the conference of the parties to the convention on biological diversity 2002 (5 references); Framework for an Ecosystem-based Management Plan Addu Atoll, Republic of Maldives (2011) (6 references); The Strategic Action Plan national Framework for Development 2009-2013 (2009) (49 references); Maldives 3rd Tourism master plan 2007-2011 (1 reference); Maldives national assessment report (2010) (29 references); Maldives National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) (38 references); Maldives national Strategy for sustainable development (2009) (11 references); Millennium Development Goals Maldives Country Report (2010) (18 references); Integrating Tourism into Adaptation to Climate Change in the Maldives (2008) (24 references); State of environment Maldives (2011) (34 references); National Adaptation Program of Action (2007) (62 references); National Adaptation to Climate Change (2009) (36 references); National progress Report on the implementation of the Hyogo framework for action 2009-2011 (2009) (24 references); Policy Brief on Governance and integrated Coastal Management Maldives (2008) (2 references); Solid Waste Management Regulatory framework (2010) (3 references);

Key Word/Theme	Stakeholder/Document Source/Frequency of theme
	Strategic national action plan for disaster risk reduction and climate change adaptation 2010-2020 (2010) (44 references); Third-National-Environment-Action-Plan 2009-2013 Maldives (2009) (16 references);
Adaptation and Mitigation	<u>International Organisations</u> ADB Capacity Development of the Maldives Energy Authority (2011) (2 references); ADB Maldives Environment-Assessment (2007) (9 references); ADB Tsunami Recovery and Impact Joint Needs Assessment (2005) (7 references); UK Aid Climate Change and Education Maldives (2010) (42 references); RIMES 2012 Localizing Climate Change Scenarios for the Maldives (2012) (1 reference); UNDP Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009) (49 references); UNDP developing a disaster risk profile for Maldives (2006) (8 references); UNDP Integrating climate change risks into resilient island planning in the Maldives (2009) (44 references); UNDP Outcome Evaluation. Country Programme Maldives 2003-2007 (2007) (20 references);
Adaptation and Mitigation	<u>Private Sector</u> Kuoni Corporate Social Responsibility (2010) (13 references); Thomas Cook Sustainability Report (2010) (38 references); Thompson Sustainable Holiday Futures Report (2010) (22 references); TUI Guidelines for Environmental Sustainability in Hotels (2010) (42 references); TUI Sustainable Development Report (2010) (19 references); Centara (2012) (3 references); Kuramathi (2012) (1 reference); Reethi beach (2012) (4 references); Sonevafushi (2012) (12 references); Sustainability Policy Meeru & Vilamendhoo (2012) (17 references);
Adaptation and Mitigation	<u>Third/Voluntary Sector</u> A Regional Synthesis Of Results and Lessons from Mangroves For The Future Small Grants Project 2009-2011 (2012) (9 references); Blue Peace Maldives (2012) (2 references); MFF Environmental awareness media project (2009) (1 reference); MFF Maldives NSAP (ND.) (24 references); Live and Learn Maldives (2012) (6 References);

Appendix 2.4: Disaster Risk

Key Word/Theme	Stakeholder/Document Source/Frequency of theme
Disaster Risk	<u>Government</u> Environmental Protection Factsheets (2006) (1 reference); First National Communication of the Republic of Maldives to the united nations framework convention on climate change (2001) (10 references); The Strategic Action Plan national Framework for Development 2009-2013 (2009) (46 references); Maldives 3rd Tourism master plan 2007-2011 (14 references); Maldives national assessment report (2010) (38 references); Maldives National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) (10 references); Maldives national Strategy for sustainable development (2009) (1 reference); Millennium Development Goals Maldives Country Report (2010) (10 references); State of environment Maldives (2011) (28 references); National Adaptation Program of Action (2007) (20 references); National Adaptation to Climate Change (2009) (2 references); National progress Report on the implementation of the Hyogo framework for action 2009-2011 (2009) (39 references); Strategic national action plan for disaster risk reduction and climate change adaptation 2010-2020 (2010) (57 references); Third-National-Environment-Action-Plan 2009-2013 Maldives (2009) (8 references);
Disaster Risk	<u>International Organisations</u> ADB Maldives Environment-Assessment (2007) (7 references); A rapid assessment of perceptions into environmental management in the Maldives (2006) (8 references); ADB OECD Validation of the Country Strategy Program Completion Report (2007) (17 references); ADB Tsunami Recovery and Impact Joint Needs Assessment (2005) (30 references); UK Aid Climate Change and Education Maldives (2010) (24 references); IUCN Valuing Bio-diversity the economic case for bio-diversity conservation in the Maldives (2009) (12

Key Word/Theme	Stakeholder/Document Source/Frequency of theme
	references); UNDP Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009) (61 references); UNDP developing a disaster risk profile for Maldives (2006) (53 references); UNDP Integrating climate change risks into resilient island planning in the Maldives (2009) (27 references); UNDP Outcome Evaluation. Country Programme Maldives 2003-2007 (2007) (8 references); WTO Diagnostic Trade Integration Study Maldives (2006) (15 references); WTO Draft Report of Diagnostic Trade Integration Study of Maldives (2005) (5 references); WTO Trade Policy Review of Maldives (2010) (6 references);
Disaster Risk	<u>Private Sector</u> Thomas Cook Sustainability Report (2010) (4 references); Thompson Sustainable Holiday Futures Report (2010) (1 reference); Kuoni CSR (2010) (3 References); TUI Guidelines for Environmental Sustainability in Hotels (2010) (2 references); TUI Sustainable Development Report (2010) (1 reference); Anantara (2012) (3 references); Baros (2012) (1 reference); Four Seasons Landaa Giraavaru (2012) (5 references); Seamarc Coastal pollution loading and water quality criteria Maldives (2010) (5 references);
Disaster Risk	<u>Third/Voluntary Sector</u> MFF A Regional Synthesis Of Results and Lessons from Mangroves For The Future Small Grants Project 2009-2011 (2012) (17 References); American Redcross Maldives (2010) (14 references); Blue Peace Maldives (2012) (12 references); Live and Learn Maldives (2012) (1 reference); MFF Maldives NSAP (ND) (17 references); MCS/Scuba Tours Observations of reef conditions on central Maldives reefs (2005) (22 references);

Appendix 2.5: Waste Management

Key Word/Theme	Stakeholder/Document Source
Waste Management	Government First National Communication of the Republic of Maldives to the united nations framework convention on climate change (2001) (27 references); First national report to the conference of the parties to the convention on biological diversity (2002) (22 references); Framework for an Ecosystem-based Management Plan Addu Atoll, Republic of Maldives (2011) (24 references) ; The Strategic Action Plan national Framework for Development 2009-2013 (2009) (26 references); Maldives 3rd Tourism master plan 2007-2011 (2007) (14 references); Maldives national assessment report (2010) (39 references); Maldives National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) (10 references); Maldives national Strategy for sustainable development (2009) (2 references); Millennium Development Goals Maldives Country Report (2010) (19 references); Integrating Tourism into Adaptation to Climate Change in the Maldives (2008) (36 references); State of environment Maldives (2011) (53) references; National Adaptation Program of Action (2007) (8 references); National Adaptation to Climate Change (2009) (1 reference); Strategic national action plan for disaster risk reduction and climate change adaptation 2010-2020 (2010) (9 references); Technology transfer for promoting 3Rs. Adapting, Implementing and scaling up appropriate Technologies (2011) (31 references); Third-National-Environment-Action-Plan 2009-2013 Maldives (2009) (19 references); Environmental & Social Assessment Framework (2008) (35 References); User Pays Framework for Island Waste Management Services (2010) (42 References);
Waste Management	International Organisations ADB Maldives Environment-Assessment (2007) (16 references); A rapid assessment of perceptions into environmental management in the Maldives (2006) (30 references); ADB OECD Validation of the Country Strategy Program Completion Report (2007) (8 references);

Key Word/Theme	Stakeholder/Document Source
	ADB Tsunami Recovery and Impact Joint Needs Assessment (2005) (14 references); UK Aid Climate Change and Education Maldives (2010) (11 references); IUCN Valuing Bio-diversity the economic case for bio-diversity conservation in the Maldives (2009) (18 references); UN Management of solid waste and sewage Maldives (2002) (32 references); CUSP. Marine Energy in the Maldives - final main report (2011) (3 references); PPIF IFC Maldives Waste (2011) (23 references); UNDP Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009) (37 references); UNDP Integrating climate change risks into resilient island planning in the Maldives (2009) (2 references); UNDP Outcome Evaluation. Country Programme Maldives 2003-2007 (2007) (46 references); WTO Diagnostic Trade Integration Study Maldives (2006) (3 references);
Waste Management	<u>Private Sector</u> Kuoni Corporate Social Responsibility (2010) (4 references); Thomas Cook Sustainability Report (2010) (32 references); Thompson Sustainable Holiday Futures Report 2010 (4 references); TUI Guidelines for Environmental Sustainability in Hotels (2010) (46 references); TUI Sustainable Development Report (2010) (7 references); Adaaran (2012) (2 references); Centara (2012) (1 reference); Reethi Beach (2012) (8 references); Sonevafushi (2012) (12 references); Sustainability Policy Meeru &Vilamendhoo (2012) (References 31 references); Seamarc Coastal pollution loading and water quality criteria Maldives (2010) (56 references);
Waste Management	<u>Third/Voluntary Sector</u> MFF A print media awareness campaign to protect mangrove habitats in the Maldives (ND.) (1 reference); Strengthening the waste management system on Noonu Manadhoo Atoll and greening the island (2009) (11 references); Blue Peace Maldives (2012) (4 references); MFF Establishing a waste disposal site (2011) (15 references);

Key Word/Theme	Stakeholder/Document Source
	MFF Increasing awareness about waste management (2009) (20 references); Live and Learn Maldives (2012) (29 references); MFF Maldives NSAP (ND.) (28 references); American Redcross Maldives (2010) (2 references);

Appendix 2.6: Capacity/Resource Issues

Key Word/Theme	Stakeholder/ Document Source Sources
Capacity/Resource Issues	Government Capacity Development Action Plan. National Capacity Self-Assessment Integrated Climate Change Strategy Projects (2008) (16 references); Coastal Monitoring, Reef Island Shoreline dynamics and management implications (2010) (4 references); Environmental Protection Factsheets (2006) (12 references); First National Communication of the Republic of Maldives to the united nations framework convention on climate change (2001) (85 references); First national report to the conference of the parties to the convention on biological diversity (2002) (76 references); Framework for an Ecosystem-based Management Plan Addu Atoll, Republic of Maldives (2011) (30 references); The Strategic Action Plan national Framework for Development 2009-2013 (2009) (312 references); Maldives 3rd Tourism master plan 2007-2011 (2007) (45 references); Maldives national assessment report (2010) (82 references); Maldives National Capacity Self-Assessment Report and Action Plan for Global Climate Change, Biodiversity and Land Degradation Conventions (2009) (88 references); Maldives national Strategy for sustainable development (2009) (32 references); Millennium Development Goals Maldives Country Report 2010 (97 references); Ministry Environment Integrating Tourism into Adaptation to Climate Change in the Maldives (2008) (26 references); State of environment Maldives (2011) (74 references); National Adaptation Program of Action (2007) (67 references); National progress Report on the implementation of the Hyogo framework for action 2009-2011 (2009) (37

Key Word/Theme	Stakeholder/ Document Source
	Sources
	references);
	Policy Brief on Governance and integrated Coastal Management Maldives (2008) (11 references); Solid Waste Management Regulatory framework December (2010) (3 references); Strategic national action plan for disaster risk reduction and climate change adaptation 2010-2020 (2010) (80 references); Technology transfer for promoting 3Rs. Adapting, Implementing and scaling up appropriate Technologies (2011) (8 references); Third-National-Environment-Action-Plan 2009-2013 Maldives (2009) (33 references);
Capacity/Resource Issues	<u>International Organisations</u> ADB Capacity Development of the Maldives Energy Authority (2011) (39 references); A rapid assessment of perceptions into environmental management in the Maldives (2006) (80 references); ADB Maldives Environment-Assessment (2007) (20 references); ADB OECD Validation of the Country Strategy Program Completion Report (2007) (62 references); ADB Tsunami Recovery and Impact Joint Needs Assessment (2005) (27 references); UK Aid Climate Change and Education Maldives (2010) (34 references); IUCN Valuing Bio-diversity the economic case for bio-diversity conservation in the Maldives (2009) (36 references); UN Management of solid waste and sewage Maldives (2002) (2 references); CUSP. Marine Energy in the Maldives - final main report (2011) (29 references); UNDP Cost Benefit Study of Disaster Risk Mitigation measures in 3 Islands in the Maldives (2009) (53 references); UNDP developing a disaster risk profile for Maldives (2006) (41 references); UNDP Integrating climate change risks into resilient island planning in the Maldives (2009) (46 references); UNDP Outcome Evaluation. Country Programme Maldives 2003-2007 (2007) (86 references); WTO Diagnostic Trade Integration Study Maldives (2006) (47 references); WTO Trade Policy Review of Maldives (2010) (21 references);

Key Word/Theme	Stakeholder/ Document Source Sources
Capacity/Resource Issues	<u>Private Sector</u> Kuoni Corporate Social Responsibility (2010) (5 references); Thomas Cook Sustainability Report (2010) (4 references); Thompson Sustainable Holiday Futures Report (2010) (4 references); TUI Guidelines for Environmental Sustainability in Hotels (2010) (6 references); TUI Sustainable Development Report (2010) (3 references); Adaaran (2012) (1 reference); Centara (2012) (1 reference); Four Seasons Landaa Giraavaru (2012) (2 references); Reethi Beach (2012) (2 reference); Sustainability Policy Meeru & Vilamendhoo (6 references); Seamarc Coastal pollution loading and water quality criteria Maldives (2010) (27 references); MCS/Scuba Tours. Observations of reef conditions on central Maldives reefs (2005) (9 references);
Capacity /Resources Issues	<u>Third/Voluntary Sector</u> MFF. A Regional Synthesis Of Results and Lessons from Mangroves For The Future Small Grants Project 2009-2011 (2012) (8 references); Blue Peace Maldives (2012) (4 references); MFF Concept Paper for the Private Sector Engagement Initiative Workshop, Mangroves for the Future Programme Maldives (2012) (3 references); MFF Increasing awareness about waste management (2009) (2 references); Live and Learn Maldives (2012) (10 references); MFF Maldives NSAP (2012) (18 references); American Redcross Maldives (3 references);

APPENDIX 3: INTERVIEWEES OF THE STUDY

Type of Stakeholder	Stakeholder	Department/Name of Organisation	Month and Year of Interview	Type of Interview
Public	Government	Ministry of Tourism, Arts and Culture	May-12	Face to Face
Public	Government	Ministry of Environment	May-12	Face to Face
Public	Government	Maldives Marine Research Centre	May-12	Face to Face
Public	Government	Maldives Meteorological Organisation	May-12	Face to Face
Public	Government	Maldives Marketing & Public Relations Corporation (MMPRC)	May-12	Face to Face
Public	Government	National Disaster Management Centre (NDMC)	May-12	Face to Face
Private	Tour Operator	Kuoni	Jun-12	Face to Face
Private	Tour Operator	Thomas Cook	Jun-12	Face to Face
Private	Tour Operator	TUI	Jun-12	Face to Face
Private	Tour Operator	Cosmos	Jun-12	Face to Face
Private	Resort (local)	Meerufenfushi (Kaafu Atoll)	Jun-12	Face to Face
Private	Resort (local)	Angaga (South Ari Atoll)	Jul-12	Face to Face
Private	Resort (local)	Kudarah (South Ari Atoll)	Jul-12	Face to Face
Private	Resort (local)	Helengeli (Kaafu Atoll)	Jul-12	Face to Face
Private	Resort (local)	Vilamendhoo (South Ari Atoll)	Jul-12	Face to Face

Type of Stakeholder	Stakeholder	Department/Name of Organisation	Month and Year of Interview	Type of Interview
Private	Resort (local)	Lily Beach (South Ari Atoll)	Jul-12	Face to Face
Private	Resort (local)	Kuredu (Lhaviyani Atoll)	Jun-12	Face to Face
Private	Resort (local)	Kanuhuraa (Lhaviyani Atoll)	Jun-12	Face to Face
Private	Resort (local)	Mirihi (South Ari Atoll)	Jul-12	Face to Face
Private	Resort (local)	Baros (Kaafu Atoll)	Jul-12	Telephone
Private	Resort (local)	Velassaru (Kaafu Atoll)	Jul-12	Face to Face
Private	Resort (local)	Maafushivaru (South Ari Atoll)	Jul-12	Face to Face
Private	Resort (local)	Ranveli (South Ari Atoll)	Jul-12	Face to Face
Private	Resort (local)	Sun Island (South Ari Atoll)	Jul-12	Face to Face
Private	Resort (foreign)	Vakarufalhi (South Ari Atoll)	Jul-12	Face to Face
Private	Resort (foreign)	Shangri La (Addu Atoll)	Jul-12	Face to Face
Private	Resort (foreign)	Conrad (South Ari Atoll)	Jul-12	Face to Face

Type of Stakeholder	Stakeholder	Department/Name of Organisation	Month and Year of Interview	Type of Interview
Private	Resort (foreign)	Palm Beach (Lhaviyani Atoll)	Jun-12	Face to Face
Private	Resort (foreign)	Soneva Fushi (Baa Atoll)	Jul-12	Face to Face
Private	Resort (foreign)	Dusit (Baa Atoll)	Jul-12	Face to Face
Private	Resort (foreign)	Four Seasons Landaa Giraavaru (Baa Atoll)	Jul-12	Telephone
Private	Resort (foreign)	Taj Exotica (Kaafu Atoll)	Jul-12	Telephone
Private	Resort (foreign)	Centara (South Ari Atoll)	Jul-12	Face to Face
Private	Tourism Transport Providers	Trans Maldivian Airways	Jul-12	Face to Face
Private	Tourism Transport Providers	Maldives Air Taxi	Jul-12	Face to Face
Private	Tourist Resort Industry Service Providers	SEAMARC	Aug-12	Face to Face
Private	Tourist Resort Industry Service Providers	Watersolutions	Aug-12	Face to Face
Private	Tourist Resort Industry Service Providers	Consultant	Aug-12	Face to Face
Private	Tourist Resort Industry Service Providers	Systema	Aug-12	Email
Private	Tourist Resort	Travelife	Aug-12	Telephone

Type of Stakeholder	Stakeholder	Department/Name of Organisation	Month and Year of Interview	Type of Interview
	Industry Service Providers			
Private	Tourist Resort Industry Service Providers	Argent Risk Management Solutions	Aug-12	Email
Private	Tourism Trade Associations	MATI (Maldives Association of Tourism Industry)	Jun-12	Face to Face
Private	Tourism Trade Associations	MATATO (Maldives Association of Travel Agents and Tour Operators)	Jun-12	Face to Face
Private	Tourism Trade Associations	LAAM (Live-Aboard Association Maldives)	Jun-12	Face to Face
International Organisation	UN	UNDP (United Nations Development Programme)	May-12	Face to Face
International Organisation	IUCN	IUCN (International Union for the Conservation of Nature)	May-12	Face to Face
International Organisation	ADB	Asian Development Bank	May-12	Face to Face
Third/Voluntary Sector	Bluepeace Maldives	Bluepeace Maldives	Aug-12	Face to Face
Third/Voluntary Sector	Red Crescent Maldives	Red Crescent Maldives	Aug-12	Email
Third/Voluntary Sector	Live and Learn Maldives	Live and Learn Maldives	Aug-12	Face to Face

Type of Stakeholder	Stakeholder	Department/Name of Organisation	Month and Year of Interview	Type of Interview
Third/Voluntary Sector	Local Community Educational Consultant	Local Community Educational Consultant	Aug-12	Email
Local Community	Atoll Council	South Thiladhumathi Atoll Council	Sep-12	Telephone
Local Community	Atoll Council	North Maalhosmadulhu Atoll Council	Sep-12	Telephone
Local Community	Atoll Council	Male' Atoll Council	Sep-12	Telephone
Local Community	Atoll Council	South Ari Atoll Council	Sep-12	Telephone
Local Community	Atoll Council	Mulaku Atoll Council	Sep-12	Telephone
Local Community	Atoll Council	Addu City council.	Sep-12	Telephone
Local Community	Atoll Council	North Huwadu Atoll council	Sep-12	Telephone

APPENDIX 4: INTERVIEW PROTOCOL

1) Introduction: As mentioned during our initial contact, the interview is for the purposes of my PHD research. It is about examining stakeholders' responses to environmental issues and limits and barriers that affect their responses. Questions asked will be on environmental subjects such as: Climate Change issues, Disaster Risk issues and Waste Management Issues and any other relevant areas. Thank you for accepting to be interviewed and for making the time and effort in meeting me.

2) Ground Rules: The interview will be about thirty minutes in length but may go on for longer depending on time available and issues that may need to be discussed further. Any questions you are not sure about please ask me for clarification and questions you are not comfortable with answering please say so and we will move on. The interview will be recorded with a voice recorder as it is easier to take detailed notes after the interview and it allows the conversation to flow if I am not taking notes down and you are having to wait for me mid conversation to get things written down, however if you prefer it not to be used please say so. The data from the interviews will be held on a password protected database and will be anonymous. The data will be reported in such a way in the research which ensures anonymity. I will be using direct quotes; if you are unhappy with this please do say so. I can provide a transcript of the interview if you would like and make changes to anything you are unhappy about or want to be deleted. If you are unhappy to go on and do not wish to partake please do say so. Thank you very much for your time.

3) Interview topics and probes: Climate Change, Disaster Risk, Waste Management, other environmental issues; Capacity/Resource Issues. Please see appendix 3.

4) End of the Interview: Thank you very much for your time and for your perspective on those topics. If I need some clarification with certain issues will contact you further. Again, your participation is very much appreciated.

APPENDIX 5: **'SKELETON' OF THE STRUCTURE OF THE INTERVIEW TOPICS**

Discussion topic content:

(1) Climate Change (Adaptation and Mitigation; Sea Level Rise; Coral Bleaching; Erosion; Extreme Weather Events; Water Resources; Energy; Coastal Zone Management; Nature and Biodiversity conservation)

(2) Disaster Risk (Adaptation and Mitigation; Tsunami; Flooding; Storm Surges; Water Resources; Coastal Zone Management)

(3) Waste Management (Pollution; Sanitation; Environmental Management)

 (4) Capacity/Resources (Awareness/Education; Financial issues; Technology; Communication/Network of Interaction; Human Resources; Institutional structure)

(5) Other Sub-topics (Remoteness; Fragility; Vulnerability; Topography; Economy; Political Structure, other environmental issues)

General question structure:

Q: What are your thoughts on ………………… [insert any of the topic areas/sub topics]?

Under each topic/sub-topic area discussed, prompts used to direct the conversation to ensure all relevant information could be collected included:

- Personal awareness of the given topic (influences on perception)

-Knowledge of the given topic

 -The way they value a given topic (intensity, priority areas, why)

 -Experiences of the given topic

- How they think the given topic is related to (affects or is affected by) other environmental issues/sub topics

- Current and potential responses/action/Outcomes and/or what they think would be the most appropriate response/action/outcome – why?

- What do they perceive to be the current and potential barriers/causes of a given topic/sub-topic and how do they feel these would be best dealt with/overcome – why?

Definition of potentially ambiguous terms:

Perception: understanding and interpretation of the factors around the topic and the topic itself

Value: how important do you deem [insert topic] to be in terms of its relative impact on the country and in terms of the need to act on this in relation to other environmental issues and in relation to their priorities.

Barriers: factors which blocks or impedes something

APPENDIX 6: RESULTS OF AXIAL CODING THROUGH THE CONDITIONAL RELATIONSHIP GUIDE

Appendix 6.1: Stakeholder Motivation

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
Stakeholder Motivation	Government	Political Actors; Involvement of international organisations; consequence of environmental conditions; Access to Funds; perception of risk; Lack of Transparency;	Political Agenda and Climate; Formal and informal Institutional structures of government decision making and action; civil servants and politicians access to resources; those responsible for resource distribution; political and personal links between political classes and other stakeholders; culture, awareness and norms of political classes;	International organisations pressure; Corruption; PR for Political Actors; Other stakeholders awareness and involvement; lack of appropriate human resources; lack of appropriate technology, high costs and lack of finance;	Adaptation to Climate Change by reducing risk; Mitigation through Carbon Neutrality; Disaster Risk Mitigation; Waste Management Policy and Strategy;	Reduced risk to climate change in some islands; Lack of appropriate facilities for carbon Neutrality; is it actually feasible?; Continual annual problems related to lack of drinking water in local islands and flooding; Islands vulnerable to disaster risk; waste significant problem;
	International Organisations	Organisational Agenda; Expert opinion; Literature; consequences of environmental issues; available finance; perception of risk;	Organisational structure; Decision making and resource disbursement protocols; Relationship and influence on the political classes; Government formal and informal structure; Interaction and affiliation with stakeholders such as the local community; Political Climate;	awareness and involvement of other stakeholders; human resources, PR; motivation of government enforce, implement, verify and support; available human resources with technical knowledge; appropriate technology;	Climate Change adaptation and resilience; sustainable energy development; education and awareness programmes; waste management programmes;	Meeting country goals and development targets; conditions of financing not met because measuring, reporting and verifying not undertaken by government;
	Private Sector	Government laws; Company policy; Resort manager and owner agenda; consequences of environmental issues; available resources; protection of asset/investment; perception of risk;	Government departments structure, role and interaction with the private sector; industry structure and power; Relationship and influence on the political classes; Interaction and affiliation with stakeholders such as the local	PR and Media; Finance; technology; human resources; Industry norms and behaviours; motivation of government to inform, enforce and verify;	Education and Awareness for guests; Environmental management; Help Local islands with waste management and environmental awareness; affiliate with other stakeholders on	Increase vegetation and agriculture; Reduce Carbon emissions, reduce and manage water and waste; manage erosion; monitor and grow corals; IUCN, Kuoni and Semarc collaboration; Baa atoll

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
			community; Political Climate;		environment related projects; Lobby government;	biosphere created due to private sector initiative;
	Third Sector	Agenda of the organisation; Literature; Expert opinion; consequences of environmental issues; access to funds; perception of risk;	Role, power and structure of third sector; Relationship and influence on the political classes; Political Climate;	Finance, technology, human resources, government motivation to tackle issues identified; support of other stakeholders, network of interaction and decision making; PR for the organisation;	Research and identify environmental issues, acquire funding for projects; awareness and education; climate change adaptation; coastal zone management; sustainable energy development; waste management; disaster risk reduction;	Increased public education and awareness of environmental issues; small scale infrastructure development;
	Local Community	Consequence of environmental issues; Political Actors; Community priorities; available resources; perception of risk;	Local Government structure and role; decentralisation powers for local level; formal and informal structure of central government; political climate both in country as a whole and within the local island;	Finance, technology, human resources, government motivation to tackle issues identified; support and interaction of other stakeholders;	Coastal management; Waste management; Sanitation development; Energy infrastructure development; access to sustainable drinking water resources; Flood prevention and control; drainage development;	Harbour development through government; land reclamation for expanding population; soft and hard engineering erosion barriers; flooding still an annual event in some islands; lack of drinking water; waste centres overflowing; erosion still an issue; sanitation infrastructure lacking;

Appendix 6.2: Awareness/Education

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
Awareness/ Education	Government	Political Agenda; Political Priorities; Motivation of political actors; UN agenda; available resources;	Education curriculum; Culture of Political classes; Information dissemination within government structure; Political Climate;	Finance/costs; human resources; technology; communication with stakeholders; enforcement, implementation and verifying actions; perceptions of risk;	Environmental issues included in curriculum; Awareness and Education programmes within the local community; PR and Media Events;	Increased education and awareness in local community; lack of education and awareness within government; lack of motivation within government;
	International Organisations	Agenda of International Organisations; Literature; Expert	Education Curriculum; Structure and role of	Human resources; costs; technology;	Awareness and education programmes with all	Increased education and awareness of local community;

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
		Opinion; available resources; motivation of actors within international organisations;	international organisations; role and structure of government institutions; Political Climate;	motivation of government to implement, measure, verify and report projects; communication and involvement of stakeholders; perceptions of risk;	stakeholders, especially local community;	lack of motivation for action by stakeholders; organisations perceptions not aligned to other stakeholders;
	Private Sector	Agenda and Priorities of Business owners/managers; government policy and law; available resources; motivation of private sector actors;	Education Curriculum; Industry structure, role and power; business culture; political climate;	Finance/costs; technology; human resources; communication and network of interaction with stakeholders; perceptions of risk;	Awareness and education programmes for clients and local community; Lobby government about issues;	Differing perceptions of risk in the sector and priorities compared to other stakeholders affect awareness and concerns;
	Third Sector	Agenda of the organisation; available resources; motivation of third sector actors;	Education Curriculum; political climate; Role, and structure of third sector;	stakeholders; perceptions of risk; technology, human resources, communication and network of interaction with stakeholders;	Awareness and education programmes for the local community; PR and Media; Lobby government;	Identified local environmental issues and educated the local community and increase awareness; limited by resources;
	Local Community	Local Council Agenda and island Priorities; motivation of actors in local island councils;	Education Curriculum; political climate; role and structure of island council;	Finance/costs; technology; human resources; communication and network of interaction with stakeholders; stakeholders perception of risk;	Awareness and education programmes from help of government, international organisations, third sector or the private sector;	Increasing awareness and education of locals on environmental issues; behavioural change in some ways; awareness present but lack resources to tackle issues;

Appendix 6.3: Financial Issues

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
Financial Issues	Government	Motivation to control financial situation; budget deficit; high overhead costs; borrowing to finance budget; high national debt;	Economic Climate; Tax collection; Structure and spending of budget; allocation of budget to environmental issues; Island Dispersion;	Political agenda of actors to help certain islands; motivation required to measure, verify and feedback project effectiveness to secure future funding; require human resources and technology to implement and verify projects;	Decrease government spending by reducing staff; Increase tax revenue; reduce budget deficit; reduce overheads via island consolidation; increase pool of technical local staff for projects;	Government spending increased more local councillors established and MPs wages and expenses very high; Tax collection not fully enforced; budget not sustainable require further borrowing; lack of funds allocated to

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
						environmental issues; pool of technical staff not developed;
	International Organisations	Lack of money from donors; operating costs; motivation;	Economic Climate; Political Climate; allocation of money to environmental projects among the development agenda; Island Dispersion;	Government ability to monitor, verify and feedback on project effectiveness has impact on future funding in some cases; donors may see country as politically unstable so reduce or withhold funding;	Support country to reduce dependence of costly consultants and enable internal measuring, verifying and feedback of project effectiveness to secure future funding;	Government has not developed pool of local technical staff; Government does not sufficiently measure, verify and feedback project effectiveness to donors;
	Private Sector	Agenda of business owner/managers; Business profit; operating costs; motivation;	Economic Climate; Political Climate; Business Budget structure; allocation for environmental issues; Island Dispersion;	Media and PR for the business; available human resources; technology; communication and interaction with stakeholders especially local community;	Joint collaborations with other stakeholders; projects in the local area; Environmental management;	IUCN, Sseamarc and Kuoni joint project; Supporting local islands with waste management and education/awareness, buying local island produce; reducing energy costs through environmental management systems;
	Third Sector	Lack of money from donors; operating costs; motivation;	Economic Climate; political climate; access to trusts and foundations and donor agencies; Island Dispersion;	Availability of human resources, technology and communication and interaction with stakeholders;	Collaboration and communication through technology; Media and PR; increase network of interaction;	Using the internet to undertake awareness but also using it for Media such as TV and radio to get message across through collaboration with media;
	Local Community	Lack of allocated budget from central government; overhead costs; motivation;	Economic Climate; Political Climate; size and structure of local budget; allocation of budget to environmental issues; island dispersion;	Availability of human resources, technology and communication and interaction with stakeholders; Political links with government actors;	Lobby government, write letters and make phone calls;	Some islands have had some requests dealt with; some islands still waiting for replies and action from government about: waste management; erosion; flooding; storm surges; sanitation; lack of drinking water and a lack of sustainable electricity.

Appendix 6.4: Technology

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
Technology	Government	Motivation; Political Agenda; High Costs; Sustainable Future;	Use of technology; government department/actors role and responsibility for implementation; impact on environmental issues; island dispersion;	Political Actors; Feasibility; Finance/costs; human resources; communication and collaboration with stakeholders;	Wind energy; Solar energy (photovoltaic and solar thermal); Landfill biogas energy; Broadband internet;	Large scale wind energy not a major source of energy after further feasibility studies; Increasing access to broadband internet in the country; Landfill Biogas project not implemented;
	International Organisations	Motivation; Development Agenda; High Costs; Sustainable Future; Expert Opinion; literature;	Use of technology; organisational structure and responsibilities for implementation; impact on environmental issues; island dispersion;	Feasibility; Finance/costs; human resources; communication and collaboration with stakeholders;	Renewable Energy Technology Development and Application Project (RETDAP); Program for Scaling up Renewable Energy in Low Income Countries (SREP). Aims to create new economic opportunities and increasing energy access through the use of renewable energy	8 pilot renewable energy projects that include wind and solar hybrids;
	Private Sector	Motivation; Business owner agenda; high costs; expert opinion; competitor use;	Use of technology; business structure and responsibilities for implementation; impact on environmental issues; island dispersion;	Feasibility; Finance/costs; human resources; Media and PR communication and collaboration with stakeholders;	Environmental Management Systems; Travelife; GreenGlobe;	Solar (photovoltaic and thermal); reusing heat created from generators for laundry and heating water; using inverters in air conditioners to save energy and heat water; reuse reducing waste through: composting, compacting, crushing and shredding; energy saving lights; using more efficient ; increasing efficiency in desalination plants in terms of energy usage; monitor use of energy in system and turn off areas where it is not needed;

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
	Third Sector	Motivation; Development Agenda; High Costs; Sustainable Future;	Use of technology; organisation structure and responsibilities for implementation; impact on environmental issues; island dispersion;	Feasibility; Finance/costs; human resources; communication and collaboration with stakeholders;	Increase education and awareness on technologies;	Local community awareness of possible tools to reduce costs;
	Local Community	Motivation; High Costs; Sustainable Future; stakeholder support;	Use of technology; role and responsibilities for implementation; impact on environmental issues; island dispersion;	Feasibility; Finance/costs; resources; communication and collaboration with stakeholders;	Lobby, write to and call the government to take action on technology needs or solutions to problems which require technologies	Some islands have some technological infrastructure but very limited. Broad available on a number of local islands, enable to communicate with stakeholders and get information

Appendix 6.5: Communication/Network of Interaction

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
Communication/ Networks of Interaction	Government	Motivation; Access resources; Awareness; informing; Collaboration; Policy and Planning; Decision making and action;	Structure of network of communication and dialogue by government formal and informal about environmental issues;	Political Climate; Political actors formal and informal relationships with stakeholders; perceived benefits for communication; level of vertical and horizontal communication;	Stakeholder Dialogue developing policy; using MPs and Local Councillors source of information about community; collaboration with private sector, international organisations and third sector in meetings and conferences; sending representatives to local islands to discuss issues; using the internet to communicate to local islands; produced literature, use expert opinion and use media;	High communication and collaboration between government, international organisations and private sector in projects; communication with local community results in increasing understanding about issues; private sector informed on potential policy changes and able to give their view; understand and know goals of international organisations; political actors influence collaboration projects between private and public sector for personal gain;

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
	International Organisations	Motivation; Access resources; Awareness; information; Collaboration; Decision making and action;	Structure of network of communication and dialogue by international organisations about environmental issues;	Political Climate; organisations actors relationship with political actors and other influential; level of vertical and horizontal communication;	Dialogue with stakeholders through meetings and conferences resulting in projects; collaboration with government for development projects; Collaborating with private sector to increase resilience of tourism resort infrastructure to climate change; literature and media;	communication still very limited with private sector; significant communication network with local community due to development projects; high communication and strong links with government;
	Private Sector	Motivation; Access resources; information; Awareness; Collaboration; Decision making and action;	Structure of network of communication and dialogue by private sector about environmental issues;	Political Climate; Private sector organisations actors relationship with political actors and other influential stakeholders; motivation of sector to communicate with other stakeholders especially local community;	Some resorts developed relationships with local islands to support them through environmental education, awareness, waste management and other infrastructure development; dialogue and lobby government through local trade associations; Joint collaboration between IUCN, Kuoni and Seamarc in relation to environmental issues in tourism industry; use media and PR;	Some networks created between local islands and resorts but significant number of resorts with limited connection to local community; international travel agents/operators main contact are resorts so limited communication to other stakeholders; tourism ministry strong channel of communication with tourism sector; many resorts mainly converse with government only and limited contact with other stakeholders;
	Third Sector	Motivation; Access resources; information; Awareness; Collaboration;	Structure of network of communication and dialogue by third sector about environmental issues;	Political Climate; Relationship to political actors and influential stakeholders; motivation to communicate with other stakeholders;	use media and internet to communicate; lobby government; inform, educate and increase awareness of local community; communicate and develop proposals with donors;	Limited communication with private sector, links with government dependent on personal ties with political actors and that influences access to resources; high level of communication and interaction with the local community;
	Local Community	Motivation; Access	Structure of network of	Political Climate; Relationship to	Lobby and inform government	Direct communication

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
		resources; information; Awareness; Collaboration; Decision making and action;	communication and dialogue by local community about environmental issues;	political actors and influential stakeholders; motivation to communicate with other stakeholders;	through local council representatives and local MP; Communicate with resorts in close proximity;	and links to government through official and unofficial channels; political actors and ties influence communication; some local islands communicate and have relationships with resorts which result in support from resorts nearby others have limited or no communication; communication with government does not mean government will reply or take action to issues;

Appendix 6.6: Institutional Structure

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
Institutional Structure	Government	Motivation; Political Agenda; entrenched social functioning;	High level of bureaucracy; ; formal and informal institutions;	Political Actors; International Organisational support and pressure; government motivation for change;	Reducing government spending by reducing civil service numbers; collaboration and communication between ministries; decentralise decision making powers to local level; create pool of local technical staff for projects;	Government spending increased due to increased local councillors and high wages and expenses of a high number of MPs; increased collaboration between ministries but not enough; key staff members with decision making authority do not stay in job role for long; changes to names and functioning of ministries have caused confusion; decentralisation not fully established still rely on central decision making; pool of local technical staff

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
						not developed; development projects not finished in time and to specifications;
	International Organisations	Motivation; Predominantly donor driven organisational agenda;	Bureaucracy; mostly centralised structure;	Donor and manager motivation for change;	Put in country office representatives or managers to help implementation; collaborate with and support government to measure, verify and feedback project impact to secure future funding;	Project proposal to implementation phase very slow; unable to get projects implemented in the time framework and measured for effectiveness; difficult to obtain and access for new projects;
	Private Sector	Motivation; Business owner/manager agenda; expert opinion;	Hierarchical;	Company audit and consultation recommendations; owner/manager motivation for change; competitor actions;	Create structures for more stakeholder dialogue within firm; interaction and collaboration along supply chain; develop links with local stakeholders at destination level;	Increased input of employees; implementing environmental management systems along supply chain; communication and involvement with local community through projects;
	Third Sector	Motivation; Owner/manager agenda; donor agenda;	Some decentralised and others more centralised;	Owner/manager motivation for change;	Flexible structure depending on donor;	Some structures more flexible than others;
	Local Community	Motivation; Government Agenda; social structure;	Level of autonomy; Level of decentralisation;	Government and local political actor motivation; motivation to change social structure;	Lobby government to decentralise powers to local level; interaction with local resorts over use of local resources and projects;	Not fully decentralised, some decision making powers but majority of decision making is by central government;

Appendix 6.7: Human Resources

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
Human Resources	Government	Motivation; Availability of jobs; current skills and education;	Population; Cultural perceptions of certain jobs; government institutions;	Access to higher education inside and outside the country; training opportunities; costs of education; access to finance education; government priorities; political	Maldives College of Higher Education (MCHE) curriculum changes to meet job market demand; Faculty of Hospitality and Tourism studies	Private sector/ resorts not complying with government contracts and agreements to hire and train local staff; private sector/resorts

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
				agenda; vested interests of stakeholders;	links with tourism sector; developing pool of local technical staff to be used continuously in donor funded and government projects; educate and train government staff through courses and sponsorship;	not making links with MCHE and developing work experience and apprenticeship programmes; Donor funded pool of local technical staff not created; dependence on expat consultants who are only present for duration of contract;
	International Organisations	Motivation of government and international organisations; Availability of jobs in projects; current skills and education;	Population; Cultural perceptions of certain jobs; international organisations and government institutions;	Availability of local technical staff; Access to higher education inside and outside the country; training opportunities; costs of education; access to finance education;	Support and fund government to develop a pool of local technical staff that can be used in all projects without relying on expat consultants;	Pool of local technical staff not created;
	Private Sector	Motivation of private sector and government; Availability of jobs in the sector; current skills and education;	Population; Cultural perceptions of certain jobs;	Availability of locals with foreign languages; availability with international hotel experience; vested interests of stakeholders in the private sector;	Apprenticeships and training in some resorts for locals; financing higher education of local management staff a few resorts;	Private sector/ resorts not complying with government contracts and agreements to hire and train local staff; private sector/resorts not making links with MCHE and developing work experience and apprenticeship programmes;
	Third Sector	Motivation of government and third sector; Availability of jobs in the sector; current skills and education;	Population; Cultural perceptions of certain jobs;	Availability of local technical staff; Access to higher education inside and outside the country; training opportunities; costs of education; access to finance education; vested interests of NGO; political links;	Apprenticeships and training;	Some NGOs linked through political affiliations and therefore staff related to political parties; staff development and use of local staff projects;
	Local Community	Motivation of government; current skills and education;	Population; Cultural perceptions of certain jobs;	Availability of local technical staff; Access to higher education inside and outside the country; training opportunities; costs of education; access to finance education; vested interests of local political actors;	Request government to recruit, educate and train local level staff to undertake tasks at local level;	Government not taken action to train local island staff, so still rely on staff from capital coming to local islands to undertake tasks, which increases government costs and time taken to travel;

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Appendix 6.8: Political Corruption

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
Political Corruption	Government	Motivation; Political agenda; Political Actors;	Political Parties; MPs; Local Councillors; Political Climate; Political Culture;	Access to public funds, resources and control; Access to executive boards of state companies; Access to public/private project creation; Access to donor development funds; Access to government contracts;	Anti-Corruption Commission; Police Integrity Commission; Human Rights Commission;	Misuse of donor and public funds by political actors and associates for personal gain; political actors and associates using government contracts for personal gain; anti-corruption commission heavy workload, require human resources; lack of judicial authority and lack of enforcement on wrongdoing; public funds used for campaigning and expanding political party membership;
	International Organisations	Motivation; Political agenda; Political Actors;	Political Parties; MPs; Local Councillors; Political Climate; Political Culture;	Access to public funds, resources and control; Access to executive boards of state companies; Access to public/private project creation; Access to donor development funds; Access to government contracts;	Reducing or stopping funding; supporting capacity building in government institutions; intermediary during political instability;	Funding for projects not available due to confidence being lost but also government not implementing and measuring the effectiveness of projects due to political priorities; improvements in institutions but more work needed but relies on government motivation; some foreign government influence/intrusion causes further instability and bodies such as UN useful in monitoring foreign government influence;
	Private Sector	Motivation; Political agenda; Political Actors; Business operators;	Political Parties; MPs; Local Councillors; Political Climate; Political Culture;	Access to public funds, resources and control; Access to executive boards of state companies; Access to public/private project creation; Access to donor development funds; Access to government contracts;	Reduced or stopped investment due to risk and uncertainty; use PR and Media to show instability is linked to capital rather than the rest of the country; resorts continue as business as usual; Anti-corruption commission investigate	Reduced inflow of tourists from certain source markets but these markets not dependable as other markets which remained stable; some local and foreign businesses involved with political actors and so has created political tensions;

Phenomenon	Stakeholder	Causal conditions	Context	Intervening conditions	Action strategies	Consequences
					business contracts and political actor links;	
	Third Sector	Motivation; Political agenda; Political Actors;	Political Parties; MPs; Local Councillors; Political Climate; Political Culture;	Access to public funds, resources and control; Access to executive boards of state companies; Access to public/private project creation; Access to donor development funds; Access to government contracts;	Working with international organisations on projects; Making links with government;	Reduced access to funding during instability; some NGOs access finance through political affiliations and link to government; working in local islands some take political stance during projects others are more neutral;
	Local Community	Motivation; Political agenda; Political Actors; Social Structure;	Political Parties; MPs; Local Councillors; Political Climate; Political Culture;	Access to public funds, resources and control; Access to executive boards of state companies; Access to public/private project creation; Access to donor development funds; Access to government contracts;	Lack of actions and strategies	Significant amount of discord in local islands; lack of motivation of political parties to reduce tensions therefore created instability in local islands especially before elections; traditional social structure has helped some islands to become more stable;