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Maldives

Increasing Climate Change Resilience
of Maldives through Adaptation in the Tourism Sector (TAP)

Gaps and Disincentives that Exist in the Policies, Laws and Regulations which Act as Barriers to Investing in Climate Change Adaptation in the Tourism Sector of the Maldives

Final Report

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Dr Aishath Shakeela, Professor Susanne Becken, Ms Nicole Johnston
Centre for Tourism Sport and Services Research, Griffith Business School
Griffith University, Australia

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AUTHORS

DR AISHATH SHAKEELA

PROFESSOR SUSANNE BECKEN

MS NICOLE JOHNSTON

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Acronym List

DNP	Department of National Planning
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Regulation
ENSO	El Niño Southern Oscillation
IPCC	Intergovernmental Panel on Climate Change
MDG	Millennium Development Goals
MHAHE	Ministry of Home Affairs, Housing and Environment
MNDMB	Maldives National Disaster Management Bill
MTAC	Ministry of Tourism, Arts and Culture
NAPA	National Adaptation Plan of Action
NDMC	National Disaster Management Centre
NEAP	National Environmental Action Plan
NRRP	National Recovery and Reconstruction Plan
RPCETI	Regulation on the Protection and Conservation of Environment in the Tourism Industry
SCBD	Secretariat of the Convention on Biological Diversity
UNDP	United Nations Development Programme
UNWTO	UN World Tourism Organization

1. Executive Summary

The Republic of Maldives is extremely vulnerable to longer term climate change risks and associated extreme disaster events now and in the short term future. This report presents the findings of a project aimed to 'identify gaps and disincentives that exist in the laws, regulations, and policies which act as barriers to investing in climate change adaptation in the tourism sector of the Maldives'. This report draws on both primary and secondary research. An analysis of relevant literature and legal documents in the Maldives were undertaken. Further, 39 key tourism stakeholder interviews were conducted.

Core findings include the identification of key climate change risks facing the Maldivian tourism industry and dependent communities; including beach erosion and inundation, risks facing coral reefs and marine life, and risks of extreme weather events. This study further revealed that while the government does not have a deliberate intervention mechanism to address climate change or any laws or regulation targeting climate change adaptation *per se*, existing regulations – specifically those involving environmental management – have the potential to facilitate climate change adaptation. Indeed, many areas that are relevant to climate change adaptation (e.g. waste and coastal management) are already subject to considerable amounts of legislation.

Concurrently, a range of policy gaps, coordination gaps, and overlaps in the regulatory frameworks were identified that act as barriers to implementing or investing in climate change adaptation. Findings indicate that the systemic shortcomings and the long process involved in getting legislation through the Parliament to enact important legislation addressing mean that climate change adaptation has largely failed to date.

In addition, both in the policy and interview analysis, issues around monitoring and enforcement of existing laws, and regulations were identified as compromising the adaptive capacity of the tourism industry and the tourism dependent communities. The scattered geography of the Maldives in combination with limited (human and financial) resources, were further identified as major contributing factors to weak monitoring of compliance with existing laws. Moreover, the discretionary nature and the vague definitions of key concepts in existing laws and regulations make stringent implementation and enforcement challenging.

Based on the findings of this project, a number of recommendations have been proposed, including revising some existing laws and regulations. To have credible commitment to address climate adaptation, urgent priority needs to be given to develop a **Climate Act**, consolidating a legal framework specifically addressing climate change adaptation in the Maldives. It is further recommended to establish a **Climate Change Futures Commission** that can monitor climatic conditions in the country, consult with (and integrate) the relevant agencies and ministries, local communities, and provide advice on those aspects of existing or planned legislation and regulations that might impact climate change adaptation measures.

2. Introduction

The Intergovernmental Panel on Climate Change (IPCC, 2012) notes that island states in the Pacific, Indian, and Atlantic Oceans are particularly vulnerable to sea level rise, erosion, inundation, shoreline change, and saltwater intrusion into coastal aquifers. These impacts can disrupt the(natural environment on which many island destinations depend upon, leading to economic losses such as in fishing and tourism industries.

Tourism in small island nations such as the Maldives is dependent on the natural environment and favourable climate conditions. The tourism product itself is often based on the 3S (sun, sea and sand) concept, which are intricately linked to climate. The length and duration of weather events such as sunshine, rainfall, marine conditions all define the quality and length of tourism seasons. Extreme events such as tropical cyclones, heavy rainfall, or high temperatures have negative impacts on both the tourism industry and dependent communities. Thus changes in climate conditions have a knock-on effect on socio-economic and environmental sustainability of tourism dependent destinations such as the Maldives.

Due to the developmental potential that it holds, tourism is promoted in policy agendas on the grounds that it will enhance the lives of local people through the creation of employment and income as well as generating foreign exchange earnings. Tourism indeed has the potential to link various economic sectors and activities, and can act as a catalyst for economic development. This is well recognised by policy makers and protagonists of tourism destinations. Thus, the advent of tourism initially attracted relatively little criticism as the image of the industry was predominantly one of an “environmentally friendly activity” and a “smokeless industry” (Holden, 2008, p. 67).

However, as negative impacts of tourism emerged, tourism policies are now often formulated taking into consideration how to reduce the negative impacts associated with tourism development, and to ensure sustainability of destinations. Climate change is arguably one of the crucial risks facing tourism industry (Buckley & Shakeela, 2013). Responding to climate risks has forced policy makers to make difficult choices and to develop policies addressing climate change adaptation. The legal framework to address climate change and its adverse effects is however still ‘a work in progress’ in both developing and developed nations. Climate change policies targeted at adaption is faced with a number of challenges. For instance, as Weaver (2011, p. 5) notes, “complications arise within the tourism sector from the rudimentary state of knowledge about the relationships between the tourism and climate change, an apathetic and fickle travelling public and a reciprocally uncommitted tourism industry”.

This consultancy project aimed to identify gaps and disincentives that exist in the laws, regulations, and policies which act as barriers to investing in climate change adaptation in the tourism sector of the Maldives. Based on pertinent literature, policy analysis, and interview data, the following aspects were examined.

(1) Explore stakeholder concern about climate change risks and impacts on tourism, and prioritise which impacts are of greatest concern;
(2) Investigate what is already being done to address these climate change risks (i.e. “adapt”);
(3) Examine the legislative basis for climate change adaptation;
(4) Explore stakeholder views of incentives and disincentives that exist in the laws, regulations, and policies which relate to behaviours that are relevant for adaptation; and
(5) Identify opportunities for partnerships and new policy frameworks.

This report firstly presents a literature review pertinent to this project, followed by a background to the study context of the Maldives. Secondly a brief discussion on tourism development in the Maldives and its high reliance on the industry are followed by a discussion on climate change vulnerabilities facing the country. The milieu in which laws, regulations, and policies have been developed in the Maldivian is then presented. This is followed by the methodology used for this project. Findings of the project from the laws, regulations, and policies and the qualitative interviews are then presented. Recommendations for changes required in policies and legal instruments to enable and incentivise private sector investment for climate change adaptation in the Maldivian tourism sector are discussed.

3. Policy for Climate Change Adaptation – Literature Review

Tourism has three distinct and cross-linked components which are vulnerable to climate change: the tourists, destinations, and the tourism businesses (Buckley & Shakeela, 2013). These three components must be considered in climate adaptation policies, as adaptation requires a combination of technological, behavioural, attitudinal, economic, and management changes. Many of these will occur as broader social processes rather than the result of deliberate government policy or intervention. Nonetheless, the law will be an essential vehicle for implementing adaptation policy (Kench & Cowell, 2001), as "law provides the basis for policies aimed at changing behaviour to promote or inhibit adaptation actions *before* damage is suffered and a framework for responding to losses *after* the event" (p. 12). Seven categories of instruments which aid climate change adaptation planning have been identified by Macintosh, Foerster & McDonald (2013, pp. 2-3). These include:

(1) **Framing instruments** such as the objectives, principles and strategy clauses in state, regional and local planning policies, articulate over-arching policy goals and objectives and outline how different regulatory and non-regulatory instruments can be used to achieve these objectives.

(2) **Information instruments** are used to communicate information, including climate hazard risks, to current and future property owners and more broadly. Instruments such as planning certificates do not regulate land use or development; their functions are purely communicative. Other information instruments, such as zones, overlays and agreements on title, have a dual purpose; they can be used to transmit information and to regulate land use and development.

(3) **Regulatory instruments** are legally enforceable restrictions placed on land use activities that dictate where, what and how use and development occurs. They are employed to prevent or reduce the severity of climate hazards, eliminate or reduce the harmful effects of climate hazards, or reduce exposure to climate hazards. Fixed regulatory instruments (such as zones and overlays; hazard mapping and management plans; non-spatial regulatory restrictions; permit requirements and approval conditions; codes and guidelines and compulsory insurance; and reserves) are based on the assumption that once lawfully commenced, an existing land use will be beyond the reach of the planning system and can continue indefinitely unless intensified, expanded or abandoned. Flexible regulatory instruments (such as those that confer qualified development or use rights or involve a modification of existing lawful uses) specifically provide governments with powers to control land use and development, even after it has lawfully commenced, and therefore can be used to facilitate changes in land use and development in response to changing hazard threats. This allows a more responsive approach in light of the uncertainties surrounding the distribution, timing and magnitude of climate change impacts.

(4) **Compulsory acquisition instruments**, including property purchase and the designation of acquisition land, can be used for a broad range of public purposes,

including the resumption of hazard-prone land. Compulsory acquisition can be combined with certain voluntary instruments, such as lease-back or covenant schemes, to lower costs to government and allow continued use of land until hazards materialise.

(5) **Voluntary instruments**, involve the use of positive incentives to control or influence where, what and how land use and development occurs in order to reduce sensitivity or exposure to climate hazards, but do not compel compliance or participation. Examples include financial inducements to undertake hazard mitigation activities, voluntary buy-back schemes, land swaps and transferable development rights.

(6) **Taxes and charges**: Taxes, such as elevated council rates imposed on particular land uses in high risk areas, can be used as a spatial planning instrument to provide incentives to alter land use and development in response to climate hazards. Taxes can also be used to raise funds to assist in preparing for, or responding to, climate hazards. Charges can be used to recoup costs from landholders that benefit from protective measures provided by government agencies, and to recoup the cost of damage remediation measures provided to particular landholders or communities.

(7) **Liability shield instruments** provide a partial or full exemption from legal liability to specified entities if they take a particular action, or fail to act in a particular way, in relation to climate hazards. The purpose of these instruments is to stop people from unjustly pursuing governments or other third parties for legal compensation when hazard risks materialise. As such, these instruments can prevent the risk (or perception of risk) of legal liability operating as a barrier to adaptation decision-making. The two main approaches are statutory immunities from liability and developer indemnity agreements.

The appropriate selection of climate change adaptation instrument will depend on the socio-economic, political, and institutional factors of the tourism destination. While a range of laws which are not directly concerned with reduction of climate change impacts can facilitate adaptive efforts, others can serve as laggard in the adaptation effort, creating an impediment to both autonomous and planned adaptation (Kench & Cowell, 2001).

Studies on tourism climate change adaptation policy are scant. A number of reasons have been advanced for this. First, tourism typically consists of many different players, including private and public sector stakeholders, civic society and non-governmental organisations. Further, tourism is strongly influenced by both domestic and international interests, not all of which align with each other or are represented in policy frameworks. As Becken and Clapcott (2011) identified, often tourism is located in smaller government departments with limited legislative power. For this reason, the tourism ‘voice’ is often not heard.

In addition, and possibly not limited to the tourism sector, considerable uncertainty, long-term temporal scales, and diverse spatial scales, irreversibility, and

potential for ‘surprises’ are associated with climate change which makes policy making challenging. Being a passive player in climate change policy making does not save the tourism sector from controversy and arising conflicts in policy goals (Urwin & Jordan, 2008).

As proposed by Becken and Clapcott (2011, p. 5) there are multiple ways in which the tourism sector can be involved in climate change policy making:

(1) Tourism interests are sufficiently and equitably covered within national climate change policy (e.g. building standards) – no specific action is required.

(2) Tourism is sufficiently and equitably considered in national policy that addresses issues indirectly related to climate change (e.g. biodiversity protection) – no specific action is required.

(3) Tourism advocates for the specific inclusion of climate change aspects into national policies that address issues that are important to tourism, but that fail to take sufficient account of climate change (e.g. land use planning in coastal areas).

(4) Tourism develops its own ‘climate change policies’, specifically for the tourism sector (e.g. an accreditation scheme that includes climate change adaptation as an indicator).

In their analysis of climate policies for tourism in Vanuatu, Klint et al. (2011) found that the majority of policies identified deal with climate change through implicit adaptation processes. In the context of Fiji (Becken & Clapcott, 2011), some national policies did not consider climate change to the level that tourism stakeholders deemed appropriate (e.g. for the risk of sea level rise) or they failed to take into account the specific needs of tourism. The case study of Fiji highlighted an issue of lack of enforcement of existing policies that prevented successful adaptation or mitigation to climate change. In the context of both Vanuatu and Fiji, the need for climate risk awareness and education were found to increase adaptive capacity of the tourism industry and dependent communities. Similarly, within the South Pacific, a number of policies have been developed to address climate change adaptation and climate risk management. Within the context of the South Pacific, Rajamani, Goldberg and Lord (2011) note that these policies indirectly benefit the tourism sector adapt to climate change, (such as through water, environment and disaster risk management). However, the lack of tourism specific adaptation policies results in limited adaptation.

4. Maldives Background

The Republic of Maldives is an independent archipelagic nation located south of the Indian sub-continent, straddling the equator on the Indian Ocean. The archipelago consists of about 1,190 coral islands, dispersed on an Exclusive Economic Zone of 859,000 square kilometres, stretching 820 kilometres from north to south, and 130 kilometres from east to west at its widest point (Department of National Planning [DNP], 2013. The islands of the Maldives are geographically formed as 26 natural atolls[1], but administered as seven provinces. The islands are on average less than three metres above sea level, making it the lowest lying nation in the world.

Populated since the 5th century (Maniku, 1983), the current population of just over 331,000 inhabit 194 islands (DNP, 2013). The population is disproportionally distributed among the locally inhabited islands. The capital island Malé, an island just over 193 hectares, is the most densely populated island in the world. Only three islands of the Maldives are larger than 400 hectares. While the largest island, Gnaviyani Atoll Fuvahmulah (492 hectares) is home to 7,636, Vaavu Atoll Thinadhoo, with a land mass of 17 hectares accommodates a small population of 55 (DNP, 2013).

4.1 Maldives Tourism Development and Regulatory Framework

Tourism in the Maldives began in 1972 with the opening of two resorts when an Italian tour operator, Corbin visited the country with a group of tourists (Niyaz, 2002). A handful of private sector élites can be credited with the initiation of tourism in the Maldives, particularly with regard to the development and management of resorts. During the first two stages of tourism development, resorts were developed in close proximity to the international airport located at Hulhulé (Figure 1).

Nearly ten years after the inception of tourism, the first law specifically related to tourism was introduced (*Maldives Foreign Investment Act*, Law no. 25/79). This law was designed to require all foreign investments related to tourism to have an agreement with the Department of Tourism (now the Ministry of Tourism, Arts and Culture) and having the investment duly registered with the authority. This Law also required foreign investors to employ locals where available. Recognising the economic potential of this resource intensive industry, an import taxation system was also introduced (*Maldives Import Export Act*, Law no. 31/79).

[1] These form a greater structure known as the Laccadives-Chagos Ridge, which stretches over 2,000 kilometres. The atoll formations of the Maldives are so significant that the word ‘atoll’ is derived from *Dhivehi* (language spoken in the Maldives) word ‘Atholhu’ meaning a chain or a group of islands (Chambers, 2010).

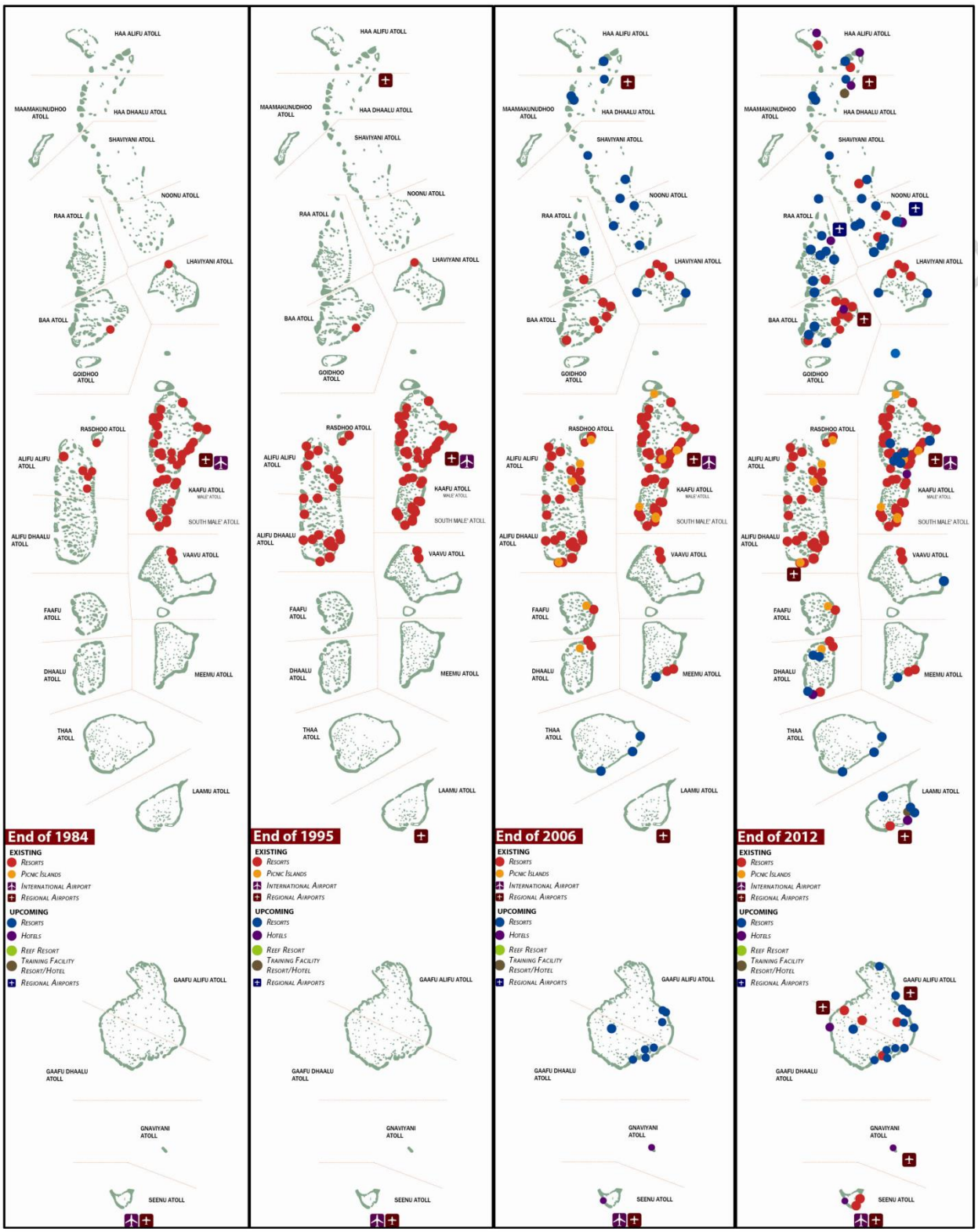

Figure 1: Maldives Resort Development 1984-2012
(Source: MTAC, 2013b)

Until the late 1970s the government 'gave' islands to affluent local élites with the industry operated on a laissez faire basis where resources were allocated where the entrepreneur felt best (Niyaz, 2002), while today islands are leased out based on

a tender process. Due to the nature of resort product in the Maldives, the government established a *Maldives Uninhabited Islands Act* (Law no. 20/98). This paved way for islands to be leased for non-tourism related development for a period of 10-35 years. Two decades after the introduction of tourism, the first law directly addressing the tourism industry (*Maldives Tourism Act*, Law no. 2/99) was introduced. This determined zones and islands for tourism development, leasing of islands for resort development, leasing of land for tourist hotels, guesthouses, and the management of all such facilities. The lease period for resort development was set at a maximum 25 years, with discretionary powers given to government for leasing islands for 35 to 50 years where the investment met certain criteria. The second amendment to the *Maldives Tourism Act* (Law no. 20/2010) regulated development of marinas, and facilitated lease of islands for a period of 50 years. Islands were leased to the highest bidder, with the resort developer required to pay an annual rent to the government. This model of resort annual rent was changed with the amendment to the *Maldives Tourism Act (*Law no. 20/2010; Amendment 2) with the rent now calculated based on the land area of the island.

4.2 Maldives Tourism Dependency

The Maldives is highly reliant on tourism for economic survival. In 2012, the industry contributed 28% to GDP, and tourism revenue (generated from tourist bed-night tax, tourism goods and service tax, land rent, lease period extension fee) accounted for 38% of government revenue (MTAC, 2013e). Over 90% of government tax revenue is from tourism, import duties and transportation related taxes (MTAC, 2013a)

The Maldivian tourism industry is predominantly made up of enclave resort islands. Currently there are 105 enclave resorts (22,889 beds), 154 safari vessels (2,503 beds), 19 hotels (1,627 beds) and 75 guest houses (1,101 beds) (MTAC, 2013e) (Figure 2). An additional 72 new islands are under construction (MTAC, 2013d) and five additional islands have been leased in August 2013 for resort development (Naif, 2012).

The Maldivian tourism industry is guided by a series of Tourism Master Plans. The First Master Plan (1983-1993) justified tourism development away from the local communities to minimise negative socio-cultural impacts. However, the enclave resort development policy was replaced in the Third Tourism Master Plan (2007-2011) and now the whole of the country (including inhabited islands) can be developed for tourism purposes.

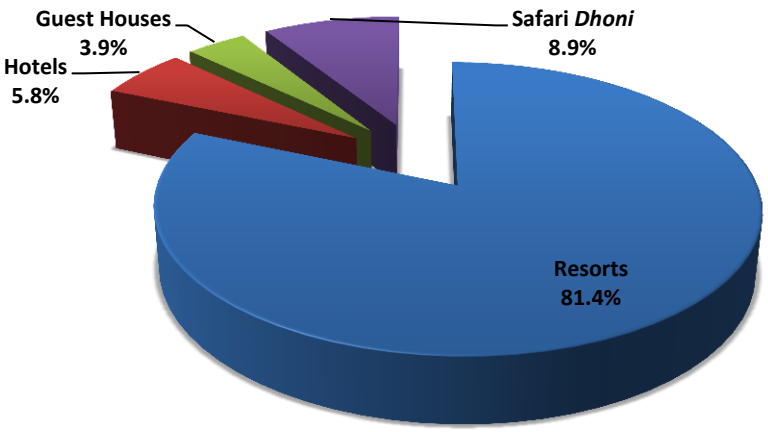

Figure 2: Bed Capacity by Sector, 2012
(Source: MTAC, 2013e)

The Maldives is one of the few countries in the world that practices 'enclave tourism', under which islands developed for tourism are "off-limits to the local people" (UNWTO, 1997, p. 13), excluding those working as employees. Due to the small size of the Maldivian islands, the industry is largely compelled to develop on a 'one-island-one-resort' concept. The resort islands are self-contained in that they have their own power generators, telecommunication system, water supply (water desalination plants), sewage treatment system and other essential requirements (Shakeela & Cooper, 2009). The major tourism products are the beach and the marine environment. However, this is also the destination's key vulnerability.

By the end of 2012, the Maldives received over 958,000 international tourists (MTAC, 2013e); triple the local population of the country. The key purpose of travel to the Maldives were for honeymoon (23%), health and wellness (22%), diving (19%) and relaxation (17%) (MTAC, 2013c).

4.3 Climate Change Vulnerabilities Facing the Maldives

Tourism makes significant contributions to economic development in the Maldives. Tourism's contribution to the economic performance of the country has meant that as of January 2011, Maldives has been promoted from a 'Least Developed Country' to that of a 'Developing Country' status (Ministry of Foreign Affairs, 2011). The Maldives also belongs to the group of Small Island Developing States (SIDS).

The natural, economic and social systems of SIDS have very high levels of vulnerability to climate change. These arise as a consequence of:

- small size;
- remoteness;
- vulnerability to external (demand and supply-side) shocks;
- narrow resource base; and
- exposure to global environmental challenges.

There are limited written records of extreme climate events climate facing the Maldives for some specific locations of the country starting from the mid-1970s onwards. Anecdotal evidence suggests climate related incidents such as "*Bodu Visaara*" (mega rain) during the 1950s (Maniku, 1990). Another challenge is that the Maldives has short records of gauging sea level, and that there is high variability between sites. Notwithstanding, the reconstruction of the last 52 years indicates a common rate of rise of 1.0 to 1.2 mm/yr (Becken, Hay, & Espiner, 2011).

In addition to the lack of historical records of hazards to rely on, other challenges relate to the inconsistencies in hazard reporting, and individual perceptions of climate risks. At the local level, no difference is made between climate related and geological conditions. For instance, discussion on climate related events is often linked with geological hazards such as the Asian tsunami of 2004 (Shakeela & Becken, 2013). Such confusion may have an impact on how climate change is addressed in policy agendas.

The identified climate change related risks facing the Maldives are sea swells, wind storms, heavy rainfall, storm surges, *udha* (king tides), and droughts (National Disaster Management Centre [NDMC], 2009; UNDP, 2007). Climate risk management is extremely costly for the Maldives. For instance, the degradation of protective coral reefs and erosion in some islands necessitated the construction of artificial breakwaters at a cost of US$ 10 million per kilometre (SCBD, 2009).

4.4 Policy for Climate Change Adaptation – the Maldivian Context

Prior to embarking on any analysis of the laws, regulations or policies of a country, it is necessary to understand the source(s) of authority granting the power to make and implement laws, regulations, and policies.

Like most Asia-Pacific countries, the Maldives operates under a constitutional system, whereby the concept of the 'rule of law' is paramount. According to Hassall and Saunders (2002, p. 29), "laws are 'legitimate' when they are made by a representative parliament, protected by a court and implemented by an accountable executive".

The current Constitution of the Maldives, which came into force on 7 August 2008, grants legislative power to the parliament (the People's Majlis). That is, the parliament is conferred the power to make statutory laws. The Constitution also provides that the parliament may delegate its powers to make legal instruments, orders and regulations to other prescribed persons and bodies. These prescribed persons and bodies (e.g. Ministries, Councils) are conferred specific powers under acts passed through the parliament. For example, the *Maldives Tourism Act* (Law no. 2/99) grants powers to make regulations in respect to certain matters to the MTAC. The *Regulation on the Protection and Conservation of Environment in the Tourism Industry* (2006) is one such regulation made by the MTAC pursuant to the *Maldives Tourism Act* (Law no. 2/99). Similarly, the *Act on Decentralisation of the Administrative Divisions of the Maldives* which came into force in 2010 confers

powers on Island, Atoll and City Councils to make regulations and policies in respect to the administration of their respective jurisdictions. Section 151 of that act grants power to the councils to formulate regulations on matters prescribed.

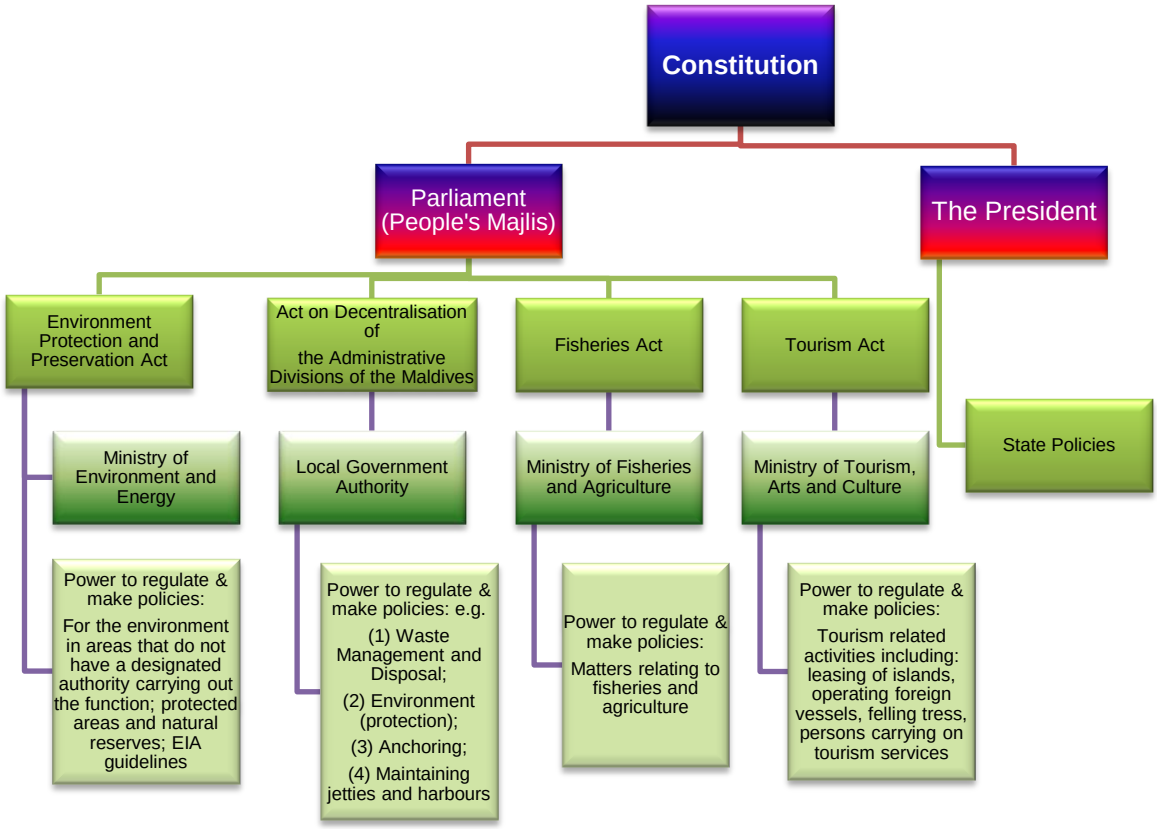

Figure 3: Hierarchical Form, the Delegation of Power to make Laws, Regulations, and Policies

General policies of the State are formulated by the President pursuant to section 115 of the Constitution in conjunction with recommendations made by Cabinet members. The implementations of such policies are to be supervised by the relevant cabinet members. Figure 3 illustrates in hierarchical form, the delegation of power to make laws, regulations, and policies in relation to matters which may impact upon climate change adaptation in the tourism sector and tourism dependent communities of the Maldives.

The Maldivian laws, regulations and policies, which impact upon climate change adaptation in the tourism sector, therefore can be made by parliament, the President, relevant ministries, and local government authorities (i.e. atoll, city or island councils).

Another aspect that needs to be considered when implementing any law, regulation or policy is the objective of the governing law and the Constitution. In relation to matters impacting on climate change, for example, section 22 of the Constitution provides that:

The State has a fundamental duty to protect and preserve the natural environment, biodiversity, resources and beauty of the country for the benefit of present and future generations. The State shall undertake and promote desirable

economic and social goals through ecologically balanced sustainable development and shall take measures necessary to foster conservation, prevent pollution, the extinction of any species and ecological degradation from any such goals.

Any law that is inconsistent with this objective is void pursuant to section 268 of the Constitution. A similar objective is stated under the *Maldives Environment Protection and Preservation Act* (Law no. 4/93). Section 1 provides that:

The natural environment and its resources are a national heritage that needs to be protected and preserved for the benefit of future generations. The protection and preservation of the countries land and water resources, flora and fauna as well as the beaches, reefs, lagoons and all natural habitats are important for the sustainable development of the country.

There is clearly a mandate to ensure that laws, regulations, and policies implemented aid in the protection of the delicate environment of the Maldives.

5. Methodology

5.1 Secondary Research

As the first stage of this project, all laws, regulations, policies, and directives pertinent to this project were identified. To identify and obtain the necessary regulatory documents relevant to this project, a web search of all Maldivian government public sector websites was undertaken. Additional documents were obtained from relevant public authorities via emails. A determination was made to exclude laws and regulations that were irrelevant to this project (e.g. *Arbitration Act*, Law no. 10/2013). Thus, only laws, regulations, and policies and other documents which focused on environment and sustainability were included in the document analysis. A number of documents are available only in the local language Dhivehi. The primary project consultant identified documents in Dhivehi read and highlighted areas which were relevant to this project. Some 38 documents thus identified were translated by a bilingual translator. The translated documents were further reviewed by the primary consultant for accuracy of translation.

As there is no data-base holding all government laws, regulations, and policies, a challenge at this stage was to ensure that all relevant documents were captured in this data collection phase. Therefore, a cross-check of laws, regulations, and policies as available from the Attorney General Office, Maldives (http://agoffice.gov.mv/V3/index.asp) was undertaken. The first data collection stage provided a catalogue of 83 documents (Appendix 1). Laws passed through the parliament and subsequently gazetted (http://www.gazette.gov.mv/v3/gazette) were included in the review, as were regulations and policies endorsed by various government agencies.

5.1.1 Doctrinal Research of Laws, Regulations, and Policies

A doctrinal research methodology was applied to analyse the laws, regulations, policies, and directives to identify the gaps and disincentives which act as barriers to investing in climate change adaptation in the tourism sector of the Maldives. Doctrinal analysis remains the defining characteristics of academic legal research (Chynoweth, 2008). Doctrinal research methodology "is the location and analysis of the primary documents in order to establish the nature and parameters of the law" (Hutchinson, 2010, p. 37). Within common law[2] jurisdictions legal rules are to be found within statutes and cases (the sources of law) but it is important to appreciate that they cannot, in themselves, provide a complete statement of the law in any given situation. This can only be ascertained by applying the relevant legal rules to the particular facts of the situation under consideration (Chynoweth, 2008). Thus, reflective interpretation of the laws and regulations are made in a historical or social context (Hutchinson, 2012), or when the interpreter has an adequate understanding of the industry or technology to which it relates.

[2] The Maldives is a hybrid legal system based on the British common law and Islamic law.

Doctrinal method is a two-part process involving the identification of the laws, and the interpretation and analysis of the document (Hutchinson, 2010); in this case, laws, regulations, and policies relevant to this project. Thus the data used for doctrinal research is primarily the laws and regulations. As aspects of the law are not clear, interpretation is required within a given factual scenario. One member of the research team, who is a trained legal expert in legal doctrine, read and analysed the laws and regulations to determine:

(1) the specific laws and regulations which impact upon climate change adaptation generally and the tourism industry specifically; and
(2) the specific provisions (or sections) facilitating or inhibiting climate change adaptation measures identified by the research team and informed by the literature review.

Table 1 outlines the laws and regulations reviewed, the year the law or regulation came into force and the responsible government agency.

Table 1: Laws and Regulations Reviewed

Laws and Regulations	Year of Enactment	Relevant Agency
Maldives Environment Protection and Preservation Act (Law no. 4/93)	1993	Environment Protection Agency (under the umbrella of Ministry of Environment and Energy)
Environment Impact Assessment Report Compilation Regulation (Regulation no: R-27/2012) and amendment (Regulation No: R-18/2013)	2012; 2013	Environment Protection Agency (under the umbrella of Ministry of Environment and Energy)
Maldives Fisheries Act (Law no. 5/87)	1987	Ministry of Fisheries and Agriculture
Regulation on the Mining of Stone, Sand and Coral	??	Ministry of Fisheries and Agriculture
Law on Stone, Sand and Coral Mining in Inhabited Islands (Law no. 77/78)	1978	Ministry of Fisheries and Agriculture
Act on Decentralisation of the Administrative Divisions of the Maldives (Law no. 7/2010)	2010	Ministry of Home Affairs
Dredging and Reclamation Regulation (Regulation No: R-15/2013)	2013	Ministry of Housing and Infrastructure

Desalination Plant Regulation	2002	Ministry of Housing and Infrastructure
Regulation on Uprooting Trees and Palms	??	Ministry of Housing and Infrastructure
Maldives National Building Code	2008 DRAFT - Not yet enacted	Ministry of Housing and Infrastructure
Land Use Plan	??	Ministry of Housing and Infrastructure
Regulation on the Protection and Conservation of Environment in the Tourism Industry	2006	Ministry of Tourism, Arts and Culture
Maldives Recreational Diving Regulation	2003	Ministry of Tourism, Arts and Culture
Yacht Marina Regulation	2005	Ministry of Tourism, Arts and Culture
Maldives Tourism Act (Law no. 2/99) incorporating amendments (Law No. 20/2010)	1999; 2010	Ministry of Tourism, Arts and Culture
Lagoon Zoning Regulation of Leased Islands for Development of Tourist Resorts, Tourist Hotels, Tourist Guesthouse and Yacht Marina (Regulation no: R-17/2012)	2012	Ministry of Tourism, Arts and Culture
Regulation on Tourism Related Developments on Uninhabited Islands (Other than Tourist Resorts)	2001	Ministry of Tourism, Arts and Culture
Maldives National Disaster Management Bill	2006 DRAFT - Not yet enacted	National Disaster Management Centre

A secondary analysis was then undertaken utilising a framework developed by Kench and Cowell (2001) to understand the role of law in contributing to a climate change adaption agenda.

5.2 Primary Research

In addition to the document analysis, and due to the exploratory nature of this research, a qualitative methodology was adopted for primary data collection. This allowed researching the phenomenon of key informants' climate change perceptions

and their adaptive behaviours. Further, this allowed the research team to explore policy and regulatory processes governing climate change and/or environment in the country without any prior structure imposed by the researchers (Creswell, 2014). To gain insights into how tourism stakeholders perceive climate change, and their understanding of institutional policies, laws and regulations which could act as barriers or disincentives to investing in climate change adaptation in the tourism sector of the Maldives, it was important to select stakeholders who either develop and/or are affected by the laws/regulations. The advantages and limitations associated with in-depth interviews are presented as Table 2.

Table 2: Advantages and Disadvantages of Interviews

Data Collection Method	Advantages	Limitations
In-depth Interviews	• High response rate • Allows for probing questions for respondent to expand on their answers • Participants can provide in-depth information • Allows researcher control over the line of questioning • Questions focuses directly on the project topic	• Difficult to find convenient times for the respondent • Slow and time consuming to collect and analyse data • Researcher's presence may bias responses • Possible bias due to the way questions may be constructed • Not all people are equally articulate and reflective

5.2.1 Sampling Approach

In identifying the tourism stakeholders for the in-depth face-to-face interviews, a non-probability purposive sampling and snowball sampling technique were used. This technique is valuable in situations where the cases are selected with a specific purpose in mind (Neuman, 2006), and are particularly popular among researchers interested in studying cases that can be used to construct socially or theoretically significant contrasts (Henry, 2009). According to Berg (2009), snowball sampling is the best way to locate subjects with certain attributes or characteristics necessary in a study. Neuman (2006, p.223) defined the snowball sample technique as one "in which the researcher begins with one case, and then based on information about interrelationships from that case identifies other cases, and repeats the process again and again".

Using information available in the public domain and expert judgement, stakeholders with a vested interest in tourism were identified. Thirty four semi-structured in-depth interviews were held with 39 key tourism stakeholders. This consisted of two councillors, two education sector members involved in climate and

environmental studies, three financial sector members, 12 government officials, two NGOs, one parliamentarian and 12 tourism sector members. Figure 4 presents the breakdown of the sample population by sector.

Out of the resort operator interviews, two interviews were conducted with environmental managers of international hotel chains with longstanding representation in the Maldives. These interviews added an international perspective of climate change impacts facing the tourism sector in the Maldives, and helped to obtain 'outsider' views on the gaps and disincentives that exist in the laws, regulations, and policies which act as barriers to investing in climate change adaptation in the tourism sector of Maldives. They wished to remain anonymous and thus their names and affiliation have not been disclosed in the interview list.

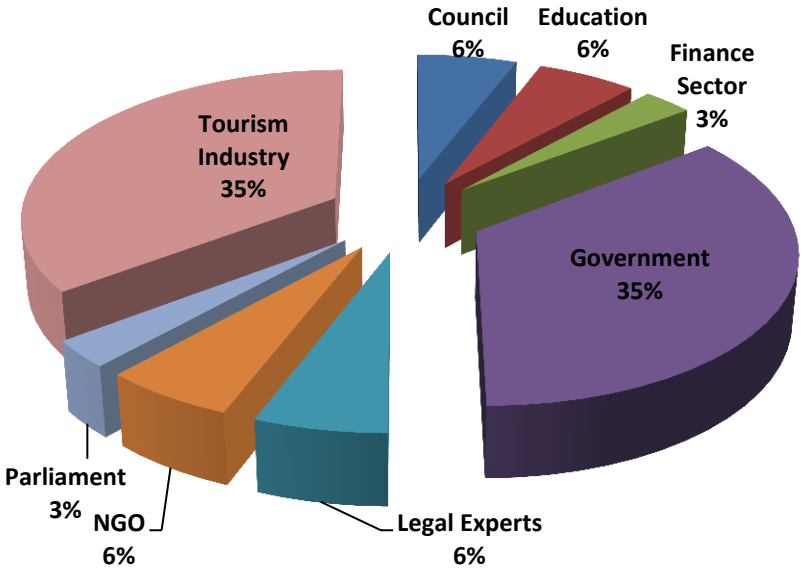

Figure 4: Stakeholder Interview List by Sector

(n=39)

Except for three telephone interviews, all interviews were conducted face-to-face at a mutually agreed location. The interviews were conducted during 25 June – 13 July 2013. Except for six interviews, all were conducted in English. Following initial high-level questions, interviewees were asked further probing questions to help them expand on a particular issue or to clarify statements made. The selected sample ensured that sufficient empirical material was collected to address research objectives, and to enable theoretical saturation. A full list of stakeholders interviewed is presented as Appendix 2.

5.2.2 Content Analysis of Interviews and Other Documents

Content analysis is a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use. This involves examining the content contained in words, meanings, pictures, symbols, ideas, themes, or any message that can be communicated. Qualitative content analysis is

defined as a “research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use” (Krippendorff, 2004, p.18). This involves examining the content contained in words, meanings, pictures, symbols, ideas, themes, or any message that can be communicated (Hair, Money, Samouel, & Page, 2007). As Hall and Valentine (2005) pointed out, it is often used as a companion research instrument in mixed method studies to enhance the validity of results by minimising biases. A discussion of the content analysis process, applied for both the in-depth interviews and other documents is given below.

Content analysis was used in the project for several reasons. Content analysis is useful in uncovering knowledge and new insights from the participants’ perspective (Dann, 2005; Maxwell, 2005). It can also be used to analyse unstructured material such as transcripts from interviews. Content analysis which uses a set procedure to make valid inferences from text is appropriate for analysis of data when an existing theory or research literature on a phenomenon is limited (Hsieh & Shannon, 2007), as is the case of this project. An advantage of using a conventional approach to content analysis is gaining direct information from study participants without imposing preconceived categories or theoretical perspectives (Hsieh & Shannon, 2007).

Additional documents pertinent to this project were identified. This included institutional directives, *aanmu usoolu* (general guidelines), frameworks, and plans. A content analysis of these documents was also undertaken. The content analysis of the in-depth interviews began with the verbatim transcription of the digitally recorded data. The interviews conducted in Dhivehi were translated and transcribed by a bi-lingual researcher. As the researcher is fluent in both languages the researcher was thus able to pick up on nuances in the text. This procedure ensured that no data were lost in transcribing and/or in translation.

The second stage involved a coding process of the interview transcripts, which is considered the core feature of the qualitative data analysis process (Creswell & Clark, 2007). In this process the raw data is transferred into a standardised form in order to establish a thematic framework of ideas (Gibbs, 2007; Greene, 2007). This can represent presence or absence or the frequency of themes or categories, or ratings based on an interpretation of text (Greene, 2007).

Qualitative content analysis of interviews was carried out using text analytical software Leximancer 4. Leximancer employs a statistical algorithm to determine the frequently used concepts within a body of text and the relationship between these concepts (Smith & Humphreys, 2006). Moreover, using Leximancer a concept map can be generated which is a visual representation of concepts that co-occur, and attract one another or overlap when the map is clustered (Rooney, Gallois, & Cretchley, 2010). The concept themes are heat-mapped to indicate importance of each theme present in the content analysis. The circles in the concept map represent the most salient theme in the cluster of concepts. Each theme is labelled after the most prominent concept in that group.

In applying Leximancer to analyse the interview data, minimal researcher intervention was applied. A key strength of Leximancer is that in using the automated coding process with minimal manual intervention; researcher bias is eliminated, thus increasing the reliability and validity of the research (Cretchley, Gallois, Chenery, & Smith, 2010). Leximancer is increasingly used as an alternative to traditional manual coding. Leximancer program has been demonstrated by Smith and Humphreys (2006) to have face validity, stability, reproducibility, correlative validity and functional validity. Figure 5 illustrates the qualitative content process applied for this project.

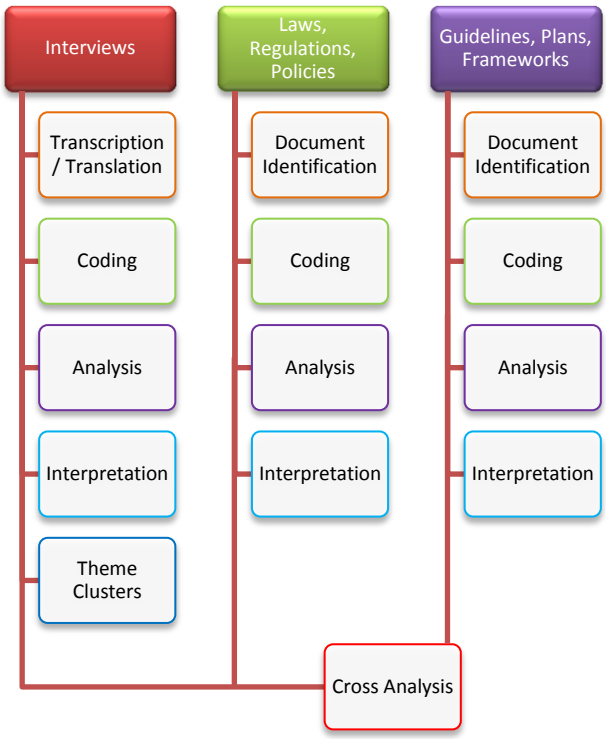

Figure 5: Content Analysis Process for Interviews and Documents

Combining qualitative content analysis of interviews and documents with doctrinal research of the laws, regulations, and policies allows for triangulations of the findings. Methodological triangulation is seen as an effective way of building trustworthiness to research design (Berg, 2009). The interviews highlighted the limited adaptive capacity of both tourism industry and dependent communities, and also revealed the gaps and disincentives which act as barriers to investing in climate change adaptation in the tourism sector of the Maldives. Based on contextual analysis and interviews, recommendations are made for changes required in policies and legal instruments to enable and incentivise private sector investment for climate change adaptation in the Maldivian tourism sector.

5.3 Limitation of the Project

During the time period this project was being carried out, there were five other climate change and tourism related studies undertaken out within the Maldives by various international consultants. Due to the small size of the Maldivian population, the key informants and stakeholders who can give an insight to this project were

often the same individuals selected for other studies being carried out concurrently in the Maldives. Thus, research fatigue from interview participants was observed. This therefore presents as a limitation of this project.

The MTAC acted as a gatekeeper to contact resorts and government participants identified by the research team. The coordination of these interviews was weak. This may have been because interview time schedule clashed with the month of *Ramazan*, where official working hours are customarily reduced in the country. Further, given the current political context of the Maldives, the Ministry acting as a gatekeeper could also have influenced low response rate of respondents.

6. Findings

There are no specific laws, regulations or policies which directly address climate change in the tourism sector of the Maldives. Determining which laws, regulations and policies relevant to this discussion is made all that more difficult as firstly, the myriad of laws and policy areas that impact tourism, but of which tourism is not the explicit focus, means that tourism is often governed in an uncoordinated manner whereby tourism issues and policies are disjointedly addressed (Reid, Ruhanen & Johnston, 2012), and secondly, there are a myriad of other laws and policies that impact upon climate change but where the specific focus is not on climate change adaptation.

As such, it is acknowledged that there are a number of laws and policies in the Maldives which may indirectly affect both climate change and the tourism sector separately. However, the focus of this research was narrowly confined to investigating the gaps and disincentives in the laws, regulations and policies that act as barriers for investing in climate change adaptation in the tourism sector. A determination was therefore made to only include laws, regulations, and policies and other documents which directly related to the stated research objective.

A representation of the laws, regulations and policies reviewed is presented in a concentric circle diagram showing the direct and indirect linkage to the research objectives (Figure 6).

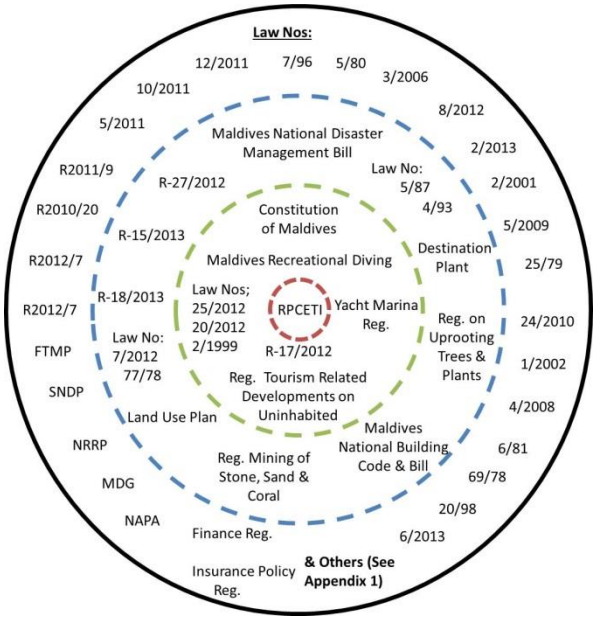

Figure 6: Laws, Regulation, Policies Reviewed

A number of coordination gaps, overlaps in laws and regulations were also identified. While the overlaps of some laws and regulations are not directly linked to climate change adaptation, there is a need to define boundaries to assure access to natural resources. For example, the *Fisheries Act* (1987) allows marine extraction, and the *Maldives Land Use Plan* further permit access to coastal zones. However, the *Lagoon Zoning Regulation of Leased Islands for Development of Tourist Resorts, Tourist Hotels, Tourist Guesthouse and Yacht Marina* (Regulation no: R-17/2012)

restrict local access (including Safari boat operators) to the marine environment near the resorts. This creates dissonance between local and resort sector.

Overlaps in public institutions mandates were also noted. For example, the *Act on Decentralisation of the Administrative Divisions of the Maldives* (2010) confers powers on Island, Atoll and City Councils to make regulations and policies in respect to the administration of their respective jurisdictions and permit adaptive measures to be taken to address local environmental issues. However, local government authorities do not have financial independence from the central government, with finance generated within the councils deposited to the Maldives Monitory Authority. Further to take adaptive measures (e.g. protect island erosion); an environmental impact assessment (EIA) has to be completed. Thus, to address immediate concerns, time is lost in communication with the relevant ministries as a clear mandate, authority and independence is not given to the local government authorities.

While no regulatory barriers to investing in climate change adaptation in the tourism sector of the Maldives was noted, the interviews indicated that some resort operators were hesitant to invest in climate adaptation. "*I don't want to be the foreign investor company that has to go and follow strictly the rules and someone can just get around the corner without escaping. I am prepared to invest in climate change only if everybody does the same. Basically I think climate investment has to be developed in such a way that there will be a return of investment for the stakeholders and it has to be explained and it has to be affordable* (TOUR02)".

Detailed findings of this project are presented in the form of tables in the following sections. In presenting these tables, those cells for which neither facilitators and/or inhibitors were found are left blank.

6.1 Climate Change Risks

The impacts of climate change are complex and inter-related, and can be separated into direct and indirect consequences. Higher temperatures, for example, will result in discomfort for tourists and may even increase the risk of infectious diseases. Warmer water temperatures increase the risk of coral bleaching and a lower productivity of the marine ecosystem. This is potentially exacerbated by changing ocean currents. Degradation of coral reefs and marine biodiversity has serious implications for the tourism sector due to a reduced attractiveness of affected marine systems for diving and snorkelling. As can be seen in Figure 7, adaptation measures need to be put in place to reduce or counter act negative impacts.

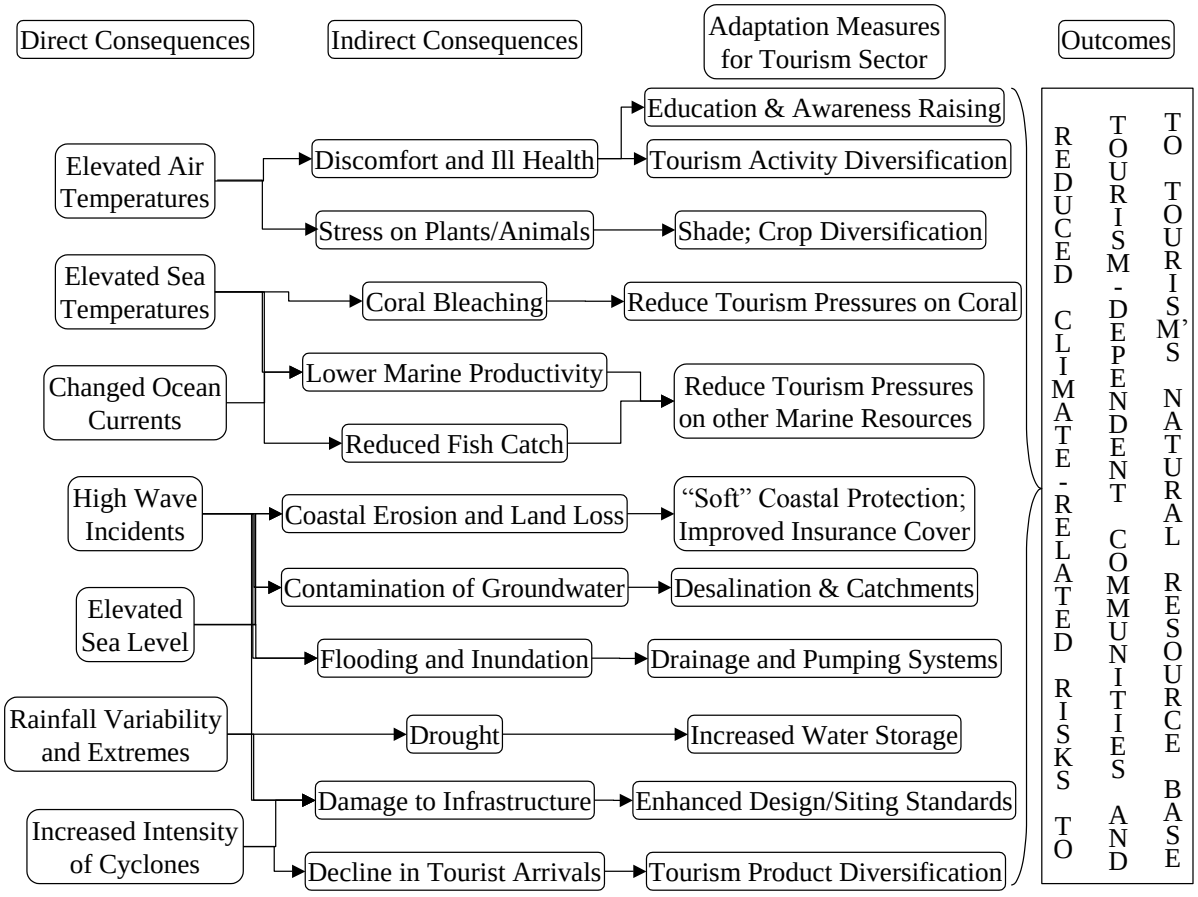

Figure 7: Direct and Indirect Consequences of Climate Change for Tourism and Adaptation Measures in Island Destinations

(Source: Becken & Hay, 2007)

Three key areas emerged from this project which related to beach erosion and inundation, coral reef and marine life, and extreme weather events. In the following, these three broad climate change risks are discussed further.

6.1.1 Beach Erosion and Inundation

In their 2007 Assessment Report, the IPCC projected globally averaged sea level rise at the end of the 21st century to range from 0.18 to 0.59 m (IPCC, 2007). Since 2007, the IPCC projections of sea level rise have been discussed as being too conservative, and future levels will depend especially on the rate of melting of the Greenland ice masses. Recent observed increases in global average sea level of 3.4 mm per year over the past 15 years are about 80 per cent greater than the IPCC's projections (Becken & Hay, 2012).

For the Maldives, Woodworth (2005) concluded that a rise in sea level of approximately 50 cm during the 21st century remains the most reliable scenario. One challenge is that the Maldives has short records of gauging sea level, and that there is high variability between sites. Notwithstanding, the reconstruction of the last 52 years indicates a common rate of rise of 1.0 to 1.2 mm/yr (Becken, Hay, &

Espiner, 2011). Another source reports that in the equatorial band the Indian Ocean, both the Malé and Gan sea level sites in the Maldives show trends of about 4 mm/yr (Kench, McLean, & Nicholl, 2005); although a long-term trend of relative sea level at Hulhulé close to Malé indicates a rise of 1.7 mm/year.

In developing a risk profile for the Maldives, Hay (2006) estimated that the maximum hourly sea level has increased by approximately 7 mm/year, a rate far in excess of the observed local and global trends in mean sea level. For Hulhulé, an hourly sea level of 70 cm above mean sea level is currently a 100-year event. Hay (2006) estimated that it will be likely to be at least an annual event by 2050.

As a result of sea level rise and changes in natural ocean currents it is possible that naturally occurring coastal erosion is exacerbated. Becken et al. (2011) reported based on information provided by the Maldives Government that an estimated 50% of all inhabited islands and 45% of tourist resorts in the Maldives currently suffer from beach erosion. This poses a challenge considering that more than 70% of the inhabited islands have buildings less than 30 metres from the shoreline. It is estimated that about 2% of the islands have buildings at the shoreline. These are not only at risk from sea level rise and erosion, but also are highly exposed to storm surges and tsunamis.

The actual contribution of climate change and resulting sea level rise to coastal erosion is highly contested. Kench and Cowell (2001) for example, found that sea level rise will lead to erosion of shorelines, but sediment will be deposited further lagoon-ward, meaning that the overall volume of sediment remains constant. At the same time, there is evidence that on-going island erosion resulting from increased water depth across reefs – as a result of sea level rise – is likely for some islands in the Pacific (Dickinson, 1999). For the particular case of the Maldives, Kench, McLean, and Nicholl (2005) propose that uninhabited islands are resilient in their geomorphology with no apparent loss of overall mass balance; even under different scenarios for sea level rise and tsunamis (evidenced in the 2004 Indian Ocean tsunami). Islands that are heavily modified by humans, however, are more vulnerable than uninhabited islands.

Whether climate change induced or not; beach erosion constitutes a real problem for resort islands and their tourism revenue, generated through the offer of sea, sand and sun tourism. There is evidence, that in areas where eroded beaches have been restored, tourist visits and revenues have increased again. Beach maintenance is therefore a key operational task for destinations and operators.

Stakeholder interviews disclose that the most concerning issue facing both the tourism industry and dependent communities is beach erosion (n=19). Section 2 of the RPCETI (2006) requires tourism developers to obtain a permit before taking any developmental activities which interferes with the natural environment, and section 2.13 prohibits extracting coral stones from any part of the lagoon or the reef of any island in the Maldives. However, challenges arise as the "*EIA is required to be conducted before any structures are built in the coastal zones, but this is only monitored for a particular extent and not followed through*" (TOUR12). Further, the

Maldives Fisheries Act (Law no. 5/87), and the *Law on Stone, Sand and Coral Mining in Inhabited Islands* (Law no. 77/78) permits coral, sand and stones to be mined upon obtaining a permit from the relevant government authority.

Combined with the allowance given in section 2 of RPCETI, these two regulations have allowed creation of a trade between some local communities and resorts in selling and buying sand. "*We buy sand from the local fishermen or sand collecting people who will collect sand from the lagoons*" (TOUR6); "*We buy sand from the locals and from other atolls as well*" (TOUR30). Replenishing sand where erosion occurs through beach nourishment and sand bagging was not recognised as a long term solution by those who were not operating tourism businesses. "*I do not believe this is a sustainable measure; it is a temporary solution to the problem so that they can continue their business*" (GOV4).

Although the *Act on Decentralisation of the Administrative Divisions of the Maldives* (Law no. 7/2010), section 24(d), allows communities to take necessary measures to alleviate land erosion problems and maintain the jetty and the breakwater of the island, there are limitations to the extent to which they can take adaptive measures. These include resource and financial limitations.

Existing laws/regulations assumes that once an EIA is approved, that the developer will act in good faith and comply with the approved EIA. However, interviews indicate otherwise, and tourism stakeholders questioned the mechanism behind such approval processes.

Section 2.10 and section 2.12 of RPCETI supports adaptation. The RPCETI requires that infrastructure or facility in an island or land leased for the development of tourism shall be built five metres inwards from the vegetation line and allows for 80% of the island to be left un-built. While this legislation supports climate change adaptation, 'vegetation line' is insufficiently defined and idiosyncrasies of each island are not taken into account. It was also identified by some that "*set back we give from the shoreline or vegetation line is too small*" (GOV10). From a business perspective, industry operators do not allow the sand dynamics to take their natural course and continue to build within the coastal hazard zone. "*All tourist facilities are located on the beach* [which are] *targeted at the tourists, such as the bar or restaurant. So we have to protect these infrastructures for the business to continue. If the natural process were to be allowed, erosion will lead to these infrastructures to be in water*" (TOUR30).

Section 3.7 of the RPCETI provides that in taking tourists to diving areas, no harm should be caused to the marine flora and fauna and no item shall be extracted or removed from such places. Most resort operators have environmental education programs targeted at informing visiting tourists about the fragility of the Maldivian environment. "*We educate tourists twice weekly we deliver a lecture about the reef system here. No guests will come here without first learning about the importance of keeping the natural environment as it is*" (TOUR5). Yet, varying environmental attitude among tourist market segments were observed among some interviewees. For instance it was noted that the "*Chinese just look for new experiences. They don't*

appreciate the environment. Even if we instruct not to stand on coral reefs they do. For the staff it is very hard to deal with the Chinese tourists" (TOUR8). Table 3 illustrates the laws, regulations, and policies which either facilitate or inhibit the Maldives adapting to beach erosion and inundation.

Table 3: Laws, Regulations, and Policies Addressing Impacts of Beach Erosion and Inundation

Adaptation Measure	**Laws, Regulations, and Policies Aligned with Measure**			
	Laws, Regulations, and Policies	**Provisions Relevant to Adaptation Measures**	**Facilitator**	**Inhibitor**
Built hard structures in the water (e.g. sea walls or groynes) [Note: this is a common adaptation measure, but it has also been found to be maladaptive in that it often leads to increased erosion elsewhere, e.g. at the ends of the seawall; it is therefore not always recommended]	Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Section 2 – provides a list of activities that require permission from the MTAC prior to the activity being carried out. Includes: a) Dredging of the lagoon b) Construction on the beach and lagoon c) Beach enhancement by pumping sand d) Construction of breakwater e) Construction of sea wall, revetment or groyne f) Dredging of lagoon or reef g) Felling of trees h) Importing or exporting living species i) Conducting research j) Anything which may adversely affect the vegetation or fresh water lens of the island.	The fact that permission on the listed activities needs to be sought is a facilitator to adaptation.	However, once permission is obtained the activities listed in this section are potentially inhibiting successful adaptation. The construction of structures on the beach or lagoon, interference with the natural shoreline, dredging, and hard structures have all proven to pose serious challenges to the long term integrity of coastal (and shoreline) systems.
Sand pumping to replenish eroded sand (often done in the night time)				

Built soft structures (temporary) such as sand bags to stabilise sand and avoid washing away beach sediment	Act on Decentralisation of the Administrative Divisions of the Maldives (2010)	Section 2.2 provides that permission of the Ministry must be obtained prior to any activity being undertaken which may cause damage or adversely affect the environment. Prior to any construction, an impact assessment report must be prepared. Section 24 provides that the **island council** shall provide municipal services to the people of the island in which the council was constituted; in accordance with the powers and responsibilities stated in Article 23 of this Act including: (d) In accordance with the Law of the Maldives, take necessary measures to alleviate the land erosion problem and maintain the jetty and the breakwater of the island.		Section 24 is ambiguous as measures to alleviate erosion could either be adaptive or maladaptive. On-going evaluation of measure and its effect would be necessary to judge this; and a catalogue of successful measures would be useful. In addition, enforcement and critical assessment of requests is important and not specified. Further, this poses a risk that the policy is not

		Section 42 which relates to the services provided by the city council mirrors section 24(d).		effective. Impact assessments need to be independent and auditable.
Keep distance of buildings from the beach by implementing a minimum distance away from the high tide mark. Only have temporary (or not so costly) structures closer to the beach. Structures close to the beach are more vulnerable to eroding shorelines, and b) may exacerbate erosion as construction works damage the natural stability of the shore system	Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Section 2.10 provides that any infrastructure or facility in an island or land leased for the development of tourism shall be built five metres inwards from the vegetation line.	Five metres inwards from the vegetation line can facilitate adaptation.	Lack of specification what exactly relates to vegetation line, and lack of consideration of island-specific factors (e.g. bathymetry, beach profile etc.) is likely to lead to maladaptation or insufficient protection.
Build critical infrastructure (e.g. power houses) in the middle of the island				
Lease of islands that are large enough (avoid islands that are so small that there is no buffer zone between sea and land)				

Un-built space, maintain large natural area and ensure buildings are centred in the middle of the island (see above)	Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Section 2.12 provides that 80% of the island must be spared un-built. The area inwards of the vegetation line shall be taken as the area of the island.	This legislation supports adaptation.	The vegetation line is insufficiently defined and idiosyncrasies of each island are not taken into account. It could be more appropriate to use the high-tide mark as an indicator.
Protection of coral reefs (e.g. conservation programmes) as healthy reefs will also protect the shore from storm surges and wave erosion; several measures possible: - Diver/snorkeler education (only look don't touch) - No-dive zones - No anchoring - No waste or sewage dumping - No extraction of materials or species - No coral sand mining - There are innovative measures that are being tested in Australia, e.g. artificial shading for reefs to avoid overheating	Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006) See also Section 6.1.2	Section 2.13 provides that it is prohibited to extract coral stones from any part of the lagoon or the reef of an island in the Maldives.	This regulation – if enforced – supports adaptation.	

Coral growing programmes, breeding of corals and transplanting into sea as a seed for reef formation				
Regrowth of natural vegetation, e.g. planting of coastal vegetation or avoiding damage to existing vegetation such as dune grasses or mangroves				
Insurance of assets (see section 6.1.3 on extreme events)	Finance Regulation	Does not require mandatory insurance		

6.1.2 Coral Reefs and Marine Life

Becken and Hay (2007) report that the effects of sea-surface warming on coral reefs in the Maldives are reflected in the increased incidence of coral bleaching and mortality events. Coral bleaching events occurred in 1977, 1983, 1987, 1991, 1995, 1997 and 1998, with almost all the shallow reefs in the country having been impacted (Mimura et al., 2007). Average live coral cover before and after the bleaching was approximately 45% and 5%, respectively, and recovery has been very slow. Bleaching events that affect the attractiveness of coral reefs have significant consequences for the tourism sector, as well as for global biodiversity (Ministry of Home Affairs, Housing and Environment [MHAHE], 2002).

Coral reefs are also important beyond their biodiversity and recreational values, because they provide a natural defence against storms and flooding (Becken & Hay, 2012). However, a wide range of stress factors in addition to higher sea surface temperature and sea level are affecting coral reefs and marine biodiversity. Damage from tropical cyclones and possible decreases in growth rates due to the increasing acidification (i.e. effects of higher CO_2 concentrations on ocean chemistry) will likely reduce the resilience of reefs. In addition, human activities, such as sewage discharge, waste pollution, physical damage, and disturbance of marine organisms, are adding to local pressures.

Table 4 illustrates the laws, regulations, and policies which either facilitate or inhibit the tourism sector in the Maldives to reduce the risks facing coral reefs and marine life. Stakeholder interviews indicate that the second most concerning issue facing the tourism industry and dependent communities is coral bleaching (n=12). A number of regulations exist to protect the marine environment. For instance, section 3.7 of the RPCETI provides that in taking tourists to diving areas, no harm should be caused to the marine flora and fauna and no item shall be extracted or removed from such places. A 'look and don't touch' rule is facilitating climate change adaptation. However, this has limitations as there are no regulations outlining the repercussions of breaking the regulations. As a resort manager noted, there is no regulation which requires tourists to comply with protecting the environment. "*Ideally I would want to have a law or regulation or a body who we can report to, or one which can fine a guest who damage our coral reefs… unfortunately that doesn't exist*" (TOUR6).

A conflict between tourism dependent communities who also rely on the marine environment, and the tourism operators was noted. "*A good fishing ground, for example a reef within a reef system, would also be a very good area for diving so there's no easy way to resolve it*" (GOV10). While fishing and marine extraction is allowed through the *Maldives Fisheries Act* (Law no. 5/87), the *Lagoon Zoning Regulation of Leased Islands for Development of Tourist Resorts, Tourist Hotels, Tourist Guesthouse and Yacht Marina* (Regulation no. R-17/2012) prohibits fishing activities within the 'exclusive zone' of resorts. This has created a conflict between different sectors of tourism industry (e.g. resorts and safari operators) as well as between resorts and tourism dependent communities. In this context a tourism stakeholder stated *"the exclusivity of the islands, surf points where an island like*

[name], *they've got a surf point on that resort, which prohibits our surfers, safari boat surfers to use that wave"* (TOUR06). While this has no direct link to climate change adaptation, there is a need to clarify boundaries of both tourism and other local economies to reduce conflict and to facilitate resource sharing in an equitable manner.

Section 5.3 of the RPCETI requires tourism operators to have incinerators, bottle crusher and waste disposal mechanism and the disposal of waste in a manner that would have the least impact on the environment, and in accordance with the laws and regulations. There is no definition of what is meant by the term 'least impact'. Currently "*every hotel throws organic waste into ocean*" (TOUR9). Dumping of raw sewers and organic waste into sea are maladaptive practices, as it has an indirect effect on the marine ecosystem. Hence, the current allowance for sewer pumping and organic waste disposal into sea should be disallowed.

A number of interviewees lamented about the weak waste management practices which exist in the country and the improper solid management system at Thilafushi. A blame game between the resort operators and safari operators as to who throws waste into the sea was further noted. "*On their way to Thilafushi a lot of this waste is dumped into the sea*" (NGO1).

While the regulation on waste disposal supports climate adaptation to an extent, no reference is made to reduce waste or the importance of recycling. The only regulation which requires recycle bins to be placed is the *Yacht Marina Regulation* (2005). Central waste management centres within the atolls where the resort is located is a feasible measure.

Table 4: Laws, Regulations, and Policies Addressing Impacts on Coral Reefs and Marine Life

Adaptation Measure	**Laws, Regulations, and Policies Aligned with Measure**			
	Laws, Regulations, and Policies	**Provisions Relevant to Adaptation Measures**	**Facilitator**	**Inhibitor**
Good practice for diving and snorkelling, guest awareness and education - Diver/snorkeler education (only look don't touch) - No-dive zones - No anchoring - Follow rotating schedule for visiting different dive places	Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Section 3.7 provides that in taking tourists to diving areas, no harm should be caused to the marine flora and fauna and no item shall be extracted or removed from such places. Section 3.8 provides that if an item or place of historical or cultural significance is found while diving with tourists, it shall be reported to the MTAC without causing damage to such item or place.	This regulation supports adaptation.	To implement it successfully, it would be useful to state what the legislative powers are if tourists do not comply.
	Maldives Recreational Diving Regulation (2003)	Chapter 2, section 3(1) provides that the maximum depth for all-recreational diving in the Maldives is 30 metres. Chapter 3, section 11(1) provides that the Maldives being a seafaring nation,	The maximum depth of 30 metres is not relevant to climate change adaptation. However, the look but don't touch rule is	

		it is expected that there will be many wrecks among the atolls. The imperative rule for wreck diving is: "Look but don't touch!" Those who do not observe this rule are not only damaging the underwater wrecks, but are also obstructing future wreck diving in the Maldives. This rule applies not only to wrecks, but also to any separate objects found under water.	facilitating.	
		Chapter 3, section 12 provides that nothing should be taken out from the sea, and particularly this prohibition refers to cultural monuments.	Prohibition to extract material assists adaptation.	
		Chapter 3, section 13 provides that as responsible divers, reasonable care should be taken to protect the marine environment, its associated living organisms and their habitats. Divers should be briefed by the instructor on responsible behaviour whilst diving, such as buoyancy control, avoiding damage to corals and physical contact with marine animals. Shark feeding is	Diver education is incentivising adaptation.	

	Maldivian Whale Shark Tourist Encounter Guidelines	NOT permitted for the divers and the dive centre staff alike. Activities that are detrimental to marine protected areas and protected species and their habitats are prohibited under the *Maldives Environment Protection and Preservation Act* (Law no. 4/93) of Maldives. Marine Protected Areas are living marine aquariums. Look but don't touch is the message in these areas, and ONLY permitted activities can take place. Protected areas, as their name suggests, are there to protect typical areas of the coral reef system, and its resident fish and other animals, in as near to a pristine condition as possible. Clause 1 provides a restriction on vessels in or near contact zone: An exclusive contact zone of a 250 metres (820.2 feet) radius applies around any whale shark.	The protection of whale sharks is at best indirectly linked to climate change adaptation in that it increases the overall health of the marine ecosystem.	
Pollution control (this refers	Regulation on the Protection and	Section 5.3 provides that waste disposal in tourist resorts, picnic	The prohibition of sewage discharge from	No definition of what is meant by least impact

to water pollution) - No waste or sewage dumping by safari boats - No sewage dumping by resorts - Excessive sunscreen in popular sports (maybe not relevant in Maldives, but been observed at Great Barrier Reef)	Conservation of Environment in the Tourism Industry (2006)	islands and marinas shall be carried out in a manner that would have the least impact on the environment, and in accordance with the laws and regulations and accordance with the following rules: 5.3.6 – It is prohibited to pump sewer or waste into the lagoons or into any protected area of the ocean from any tourist vessel. Section 7.1 provides that sewage shall be disposed in a manner that is least harmful to the environment. Section 7.2 requires that in establishing a system of sewage treatment the following shall be taken into consideration: 7.2.1 – establishing the system in a manner that it would not reach food or living species; 7.2.2. – establishing a system away from the face of the island;	vessels assists adaptation.	or how it is to be enforced. Dumping of sewage into the sea, lagoons inhibit adaptation (in an indirect way as a result of changes to the marine ecosystem).

		7.2.3 – ensure that no leak is allowed from the system on to the ground; 7.5- Treated sewage water shall not be pumped into the lagoon after treatment. 7.6- if sewage water is pumped into the sea, it shall only be carried out at night and shall be pumped out of the reef of the island. 7.7 – sewage water from toilets on tourist vessels shall be deposited into a tank suitable for that vessel, instead of pumping it directly into the sea. The said tank shall be emptied at mid ocean.		Section 7.6 revokes section 7.5 and allows sewage pumping into the lagoon. This is a maladaptive practice.
	Yacht Marina Regulation (2005)	Section 7 provides that each yacht marina must ensure that recycle/disposal bins are placed, or establish means of disposing waste so as to protect its environment. 8. All vessels using the marina must	The regulation supports adaptation.	

		ensure that any waste disposed into sea from toilets are pumped out, and all means necessary to dispose of such waste must be established, so as to safeguard human health, and the environment. Section 10 provides that if any facilities have been established at the marina, to wash and/or repair vessels coming in, these facilities must ensure all necessary means of safeguarding the environment from contaminated water, oil, or waste that may be spilled/released into sea or onto the beaches		
Waste management - No dumping of waste into sea (even dumping of organic waste not ideal as it modifies food chain) - Composting on island to reduce waste and allow growing of vegetables (reduces fuel	Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Section 5.3 provides that waste disposal in tourist resorts, picnic islands and marinas shall be carried out in a manner that would have the least impact on the environment, and in accordance with the laws and regulations and according to the following rules: 5.3.1 – incinerators, compactors and bottle crushers shall be kept and used	The regulation supports adaptation to some extent, but may not be fully sufficient. E.g. no reference to waste avoidance or recycling is made.	

requirements for transport, a win win measure) - Minimise packaging to reduce waste - Recycle water bottles to reduce plastic waste		in all tourist resorts; 5.3.2 – waste shall be disposed to the designated area for waste disposal in the region or in the absence of such, in a manner that is least harmful to the environment; 5.3.3 – in the absence of a designated area, only food and biodegradable waste may be dumped into the ocean. Such waste can only be dumped to the sea outside the atoll, taking into account the wind and ocean currents so that it would not land on the shores of islands. 5.3.4 – It is prohibited to burn waste generated from the operation of the resort in the open areas of the resort. Incinerator shall be used to dispose such waste. Plastics and other items that would cause emission of noxious gases shall not be burned.		No definition of what is meant by least impact. Dumping of food waste into the sea inhibits adaptation (in an indirect way as a result of changes to the marine ecosystem)

		5.3.8 – Every tourist vessel shall have a system for collection and keeping of waste generated in the vessel until such waste is taken to a designated place for deposition of waste.		
	Maldives Environment Protection and Preservation Act (Law no. 4/93)	Section 7(a) provides that any type of waste, oil, poisonous gases or any substances that may have harmful effects on the environment shall not be disposed within the territory of the Maldives. Section 7(b) provides that in cases where the disposal of such substances becomes absolutely necessary, they shall be disposed only within the areas designated for the purpose by the government. Section 8 provides that hazardous / toxic or nuclear wastes that are harmful to human health and the environment shall not be disposed anywhere in the territory of the country.		

	National Solid Waste Management Policy for the Maldives	Policy 3- Wastes will be managed and disposed as close as possible to the place of their generation. The strategies outlined require Island Waste Management Centres to be constructed on all inhabited islands with a population of 1,000 or more and as far as practicable ensure that the centres are equipped to enable the reuse and recycle of waste. The policy further requires that Regional Waste Management Facilities to be developed and constructed using Best Practical Environmental Option approach. Policy 5 requires the development of a database that generates information about type and quality of wastes and provides details of transportation, treatment and final disposal locations. Policy 10 prohibits the importation of non-biodegradable plastic bags and develops the facility to ban further importation of other wastes for which there is little or no opportunity to		

		recover or recycle. This policy also prohibits activities such as dumping waste and littering and introduces a licensing system that prohibits certain activities such as collecting, transporting and disposing of special wastes except under license.		
Anchoring practices - No anchoring onto reef	Maldives Tourism Act (Law no. 2/99) incorporating amendments (Law no. 20/2010)	Section 24 provides that no foreign-registered tourist vessel arriving in the Maldives shall travel or anchor within any of the territorial waters of the Maldives except after obtaining permission from the relevant Government authorities and from the MTAC in accordance with its determined regulations. The permission referred to for traveling and anchoring in the Maldives shall be issued by the MTAC upon payment of a fee of MRf 5,000.		The permission to anchor appears to relate to revenue raising and not to monitoring of anchoring in sensitive places.
	Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Section 3.4 provides that it is prohibited to anchor any vessel in a protected area. If buoys are placed in a protected area, those must be used for anchoring.	This regulation supports adaptation.	

	Maldives Recreational Diving Regulation (2003)	Chapter 3, section 14(1) provides that dive boats are not allowed to anchor on dive sites. If anchoring is required for any reason, prevent reef damage by anchoring in sandy areas or using mooring buoys.	This regulation supports adaptation.	
Conservation project (e.g. coral regrowth, turtle programmes etc.) - No extraction of materials or species - No coral sand mining	Maldives Fisheries Act (1987) Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006) Regulation on the	Section 10 provides that in the event of a special need for the conservation of any species of the living marine resources, the Ministry of Fisheries and Agriculture shall have the right to prohibit, for a specified period, the fishing, capturing or the taking of such species or the right to establish special sanctuaries from where such species may not be fished, captured or taken. Section 2.13 provides that it is prohibited to extract coral stones from any part of the lagoon or the reef of an island in the Maldives, for any purpose of an island leased for the development of tourism. Section 2.15 provides that coral stone shall not be extracted from any reef in	This regulation supports adaptation.	

	Mining of Stone, Sand and Coral	the Maldives for renovation or repair of any jetty or breakwater built. Section 3.1 provides that protected birds or marine living species shall not be caught or kept in cages or other enclosed space in an island or land leased for tourism development. Section 3.2 provides that it is prohibited to carry out any activity that would harm the protected living species in an island or harming, shifting their nests or habitat or eggs. Section 2(a) provides that the mining of stones, sand and corals from the lagoons, coral reefs and other natural habitats in the Maldivian region where stones, sand and corals are formed, can only be allowed with a permit obtained and as specified under this Regulation.		The option of obtaining a permit for sand/ coral mining poses a risk for climate change adaptation.

	Law on Stone, Sand and Coral Mining in Inhabited Islands (Law no. 77/78)	Section 2(b) provides an exemption from this regulation for the mining of coral, sand and stones from leased islands and inhabited islands. Mining of coral, sand and stones from leased islands can be carried out by complying with *Maldives Uninhabited Islands Act* (Law no. 20/98) and *Law on Stone, Sand and Coral Mining in Inhabited Islands* (Law no. 77/78). Coral, Sand and Stones from inhabited islands can be mined with permission obtained from an authority given by the Ministry of Atolls Administration (now Local Government Authority).		
Built structures (e.g. bungalows, jetties), ensure minimal impact on environment, e.g. no building on corals - there are innovative measures that are being tested in Australia, e.g. artificial shading for reefs to avoid overheating	Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Section 2.14 provides that all jetties (in tourism resorts or developments) shall be built in such a way that allows free movement of water currents and sand beneath the jetty.	This regulation supports adaptation.	The RPCETI does not take into consideration building of over-water and under water structures.

Lagoon Dredging	Maldives Tourism Act (1999; 2010)	Section 15(a) and (b) provides, *inter alia*, dredging of the lagoon of an island or land leased for development as a tourist resort or any other activity determined by the MTAC as may be likely to cause a permanent change to the natural environment of such places, may only be carried out after obtaining written permission from that Ministry and in accordance with relevant regulations made by it. Any application needs the permission of the MTAC to carry out dredging of the lagoon of an island or any other activity that may cause a permanent change to the natural environment of such a place shall contain the following. - evidence that the proposed change is fundamental for the provision of services from such a place; and - an environmental impact assessment report submitted to and approved by the Ministry of Home Affairs, Housing and	The regulation may support adaptation if enforced stringently and with climate change risks in mind.	The option of obtaining a permit for dredging poses a risk for climate change adaptation.

		Environment. Section 6(a) *inter alia*, provides that when allowing permission for dredging, the following measures must be ensured. As highlighted in Clauses 7 and 8 of this regulation, circumstances for dredging can be allowed must be considered, and details of the work, a land use plan, and a statement of reason for dredging must be proposed to the enforcement authority. In addition to these details, a geo-referenced scale chart (1:10,000) depicting the land area before and after dredging should be presented. Permission must be obtained from the enforcement authority based on such a proposal. Section 6(b) provides that once permission has been obtained as detailed in (a), an environmental impact assessment report must be made in accordance with the *Environment Impact Assessment Report Compilation Regulation*		
	Dredging and Reclamation Regulation (Regulation No: R-15/2013)			

		(Regulation no: R-27/2012) and submitted to the enforcement authority. Section 7(a) provides that in an inhabited island: 1. Dredging is necessary for the social or economic development of the island. Section 7(b) provides for land leased for tourism or agricultural purposes: 1. Work that the land has been leased for cannot be carried out without dredging. Section 10 provides that when carrying out the measures and procedures of dredging the following will be exempted under this regulation. 1. Government approved development projects carried out in inhabited island 2. Plans in the initial concept of a development project undertaken in lands leased for industrial, tourism		

		or agricultural purposes.		
	Lagoon Zoning Regulation of Leased Islands for Development of Tourist Resorts, Tourist Hotels, Tourist Guesthouse and Yacht Marina (Regulation no: R-17/2012)	Section 13(d) provides that dredging is prohibited in any area 200m from an "environmentally sensitive area". Section 13(f) provides that sand mining from an area permitted for it can be prohibited if the enforcement authority deems it necessary in order to protect the environment. Section 14(a) provides that sand, stone and coral taken from dredging can only be used for the following purposes: 1. Land reclamation 2. Construction work 3. Levelling the area of land 4. Protecting the beaches 5. An environmental impact assessment has been carried out, and the work has been permitted. Section 14(c) provides that any measures causing harm to mangroves, mudflats or any		

		environmentally protected areas is prohibited under this regulation. Section 18(a) provides that if the enforcement authority finds that on-going dredging process, permitted by the government, is causing harm to the environment, the enforcement authority has the power to stop the process under article 6 of the *Maldives Environment Protection and Preservation Act* (Law no. 4/93). Section 15 provides that if any dredging is being undertaken in an island leased for tourist resort development, it should be carried out after determining the land and lagoon area of the island, and after obtaining permission from the government authorities.		

6.1.3 Extreme Weather Events

In their Special Report on extreme events and disasters, the IPCC (2012) reported that climatic changes have been observed not only in the mean conditions but also in both the observed frequency and intensity of weather and climate extremes. These include heavy rainfall events, droughts, and strong wind events.

Global temperature increases have been measured and clearly attributed to anthropogenic influences (IPCC, 2007). More recently, the World Meteorological Organisation reported that the decade of 2001–2010 was the warmest on record. Average temperatures were measured to be 0.46°C above the 1961–1990, and 0.21°C warmer than the previous record decade 1991–2000 (Bonyhady, Macintosh, & McDonald, 2010). It is increasingly obvious that the target of 2°C by the end of the 21st century – to avoid 'dangerous global warming' – will not be achieved. Instead, warming of 3 to 4°C is more plausible.

In the meantime, the latest estimates for the Maldives date back to 2006 and 2007. The annual maximum daily temperature in the Maldives is projected to increase by about 1.5°C by the end of the 21st century (Hay, 2006). A maximum temperature of 33.5°C is currently a 20-year event, but it will be likely to have a return period of 3 years by 2025 (Mimura et al., 2007). Hot temperatures and heat waves reduce tourist comfort, may pose severe health risks for vulnerable groups, and increase operating costs, for example due to increased demands for air conditioning.

The climate in the Maldives, as an island nation in the Indian Ocean, is substantially influenced by the Asian monsoon and a seasonal alternation of two different atmospheric flow patterns: *hulhangu moosun* (south-west monsoon) and *iruvai moosun* (north-east monsoon). Both patterns are associated with the El Niño Southern Oscillation (ENSO) events; which is likely to be affected as a result of climate change (towards more frequent El Niño conditions, Becken & Hay, 2007).

As in other parts of the world, it is more challenging to project future changes in precipitation, compared with increases in temperature. For the Maldives there is no discernible long-term trend in the observed daily, monthly, annual or maximum daily rainfall (Mimura et al., 2007). Heavy rainfall (e.g. 160 mm at Hulhulé) is rare with a return period of 17 years, but Hay (2006) estimates that extreme daily rainfall will be more frequent in the future. An extreme 3-hourly rainfall of 100 mm, for example, is currently a 25-year event. It will be likely to become at least twice as common, on average, by around 2050 (Becken et al., 2011). Extreme events such as these lead to flooding and associated damage at tourist resorts, impacting both man-made and natural assets. They may also affect critical infrastructure, such as power supply and transportation structures.

Prolonged periods of no or reduced precipitation are also of concern to tourism and dependent communities; however, Hay (2006) reports that drought frequency (conceptualised as monthly rainfall below the tenth percentile) is likely to be lower in the first half of the present century, relative to the second part of the last

century. Extreme wind events are estimated to increase in the future, but there is considerable uncertainty associated with such estimates. Strong and gusty wind will affect tourism due to its impacts on transportation (e.g. air and sea travel), and recreational comfort and experiences, including the ability to snorkel and swim.

Table 5: Projected increase in air temperature (°C) by region, relative to the 1961–1990 and projected change in precipitation (%) by region, relative to the 1961–1990 period
(Mimura et al., 2007)

Indian Ocean	2010–2039	2040–2069	2040–2069
Temperature °C	0.51 to 0.98	0.84 to 2.10	1.05 to 3.77
Precipitation %	-5.4 to +6.0	-6.9 to +12.4	-9.8 to +14.7

Stakeholder interviews reveal that extreme weather events such as storm surges (n=8), hot temperatures (n=7), *udha* [king tide] (n=6), sea swells (n=5), and wind storms (n=4) were of concern to the participants. Of lesser concern were droughts (n=3) and heavy rainfall (n=2). Section 6.1 of RPCETI mandates resorts to provide clean water through desalination. While this is an adaptive mechanism in the case of droughts, this poses as a maladaptive action as operation of desalination plants increase the energy consumption of resorts and contributes to increased greenhouse gas emissions. However, regulations on water saving (such as water tanks build under infrastructures such as restaurants or rooms) can facilitate climate adaptation in both tourism sector and dependent communities. The tourism dependent communities rely on government to transport potable water during drought periods "*because its water and we have to provide water*" (GOV3). However, as water is provided free with no cost involved to the local island communities, the perceived value of water is low. An attitudinal change and long term planning mentality such as water harvesting, is required among locals in adapting to climate change.

Table 6 illustrates the laws, regulations, and policies which either facilitate or inhibit Maldives adapting to extreme weather events.

Table 6: Laws, Regulations, and Policies Addressing Impacts of Extreme Weather Events

Adaptation Measure	**Laws, Regulations, and Policies Aligned with Measure**			
	Laws, Regulations, and Policies aligned with measure	**Provisions Relevant to Adaptation Measures**	**Facilitator**	**Inhibitor**
Water supply/ desalination - Use energy efficient desalination plant to provide clean drinking water - Ensure that drinking water is only used for end uses that require high quality water; use recycled water for toilets and irrigation - Salinated chlorine pools, no drinking water required for swimming pools - Minimise the need for imported bottled water - Install water saving devices, e.g. showers and	Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Section 6.1 provides that for the purpose of clean and safe water sufficient for use in the resort, every resort shall have a desalination plant. The plant shall be registered with Maldives Water and Sanitation Authority in accordance with the *Desalination Plant Regulation* (2002) and shall comply with such regulation in the operation of the plant. Section 6.3 requires that five days drinking water is stored at every resort, picnic area, marina or other place made for tourists.	The existence of desalination plants protects from drought and in that sense supports adaptation.	Desalination plants are classified as maladaptive because they contribute to increasing energy use and greenhouse gas emissions; thus exacerbating the risk of climate change. Regulation for water saving and regulations should be developed.

dual flush toilets - Encourage guests to conserve water (e.g. towel programmes short showers etc.)	Desalination Plant Regulation (2002)	Section 4 requires an environmental impact assessment report be prepared before establishing a desalination plant. Section 6 requires that water required for the plant must be accessed as specified in the following list below (partial list outlined): (c) If water is being extracted from the ocean, the water extraction system must be designed in a way so as to withstand bad weather. (d) If water is being extracted by a well on the beach, the well must be dug in accordance with the guidelines set by MWSA. (g) The desalination plant must be designed in a way that it controls the temperature of the water taken for the plant. The pipes of the desalination plant must either be protected from heat, or made of a	This legislation supports adaptation.	

		product that would not be affected by the atmospheric temperature. (h) When pumping water from an underground well or a borehole, there must not be a change more than 50mm in the water level. (i) The water plant must not affect the scenic beauty of the environment, and must be built to fit accordingly in the environment.		
Capturing of rain water by building rainwater capture and storage tanks; need to consider hygienic issues for storing water				
Recirculation of recycled water to irrigate garden areas, also helps to further filter water and reduce sewage load into ocean. Plant vegetation that is adapted to the climatic and soil conditions and does not require excessive irrigation.				

Evacuation procedures - Have a clear evacuation plan and provide signage for guests - Staff training - Execute drills regularly - Multi-hazard planning (e.g. fire, tsunami, strong wind etc.) - Have first aid kits at hand, staff training - Ensure emergency supplies (water and food)	Maldives National Disaster Management Bill 2006[3]	Establishes the National Disaster Management Council and the National Disaster Management Authority and outlines the function.	This legislation supports adaptation.	No specific reference to tourism and tourists is made; which means that the full adaptive potential may not be exploited.
Life jackets for guests and employees (either in rooms or available elsewhere).				
Weather information routines - Check weather forecasts and warnings daily - Develop policies for dealing with warnings - Consider seasonal forecasts				

[3] At the time of writing this report, this Bill have not been gazetted and therefore not an enactment with legal force.

Insurance cover for various hazards - Business continuity plan - Have contact tree to be in touch with relevant stakeholders, community members, Government representatives etc. - Have a communication plan for overseas wholesalers, travel agents, airlines etc.				
More trees/shaded areas - Supply shade for tourists - Encourage natural air flow and cooling	Maldives Tourism Act (Law no. 2/99) incorporating amendments (Law no. 20/2010) Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Section 15(a) – provides, *inter alia*, that felling of coconut palms and trees on an island may only be carried out after obtaining written permission from that Ministry and in accordance with the relevant regulations made by it. Section 2.5 provides that trees shall not be felled in order to construct buildings or for other purposes in an island, resort or other place leased for the purpose of tourism, except with written permission from the Ministry of Tourism, Arts and Culture.	Obtaining a permit for felling coconut trees supports adaptation.	The option of permission bears the risk of limited adaptation.

		Section 2.6 provides that if a tree is felled in any place that is leased for tourism purposes, two tree or coconut palms must be replanted in the same island. Exemptions can be granted if the island does not have adequate land to replant two trees for each plant felled. Section 2.8 provides that huge, aged or rare trees shall not be felled in any place leased for the development of tourism. A building exclusion zone of 5 metres from such a tree applies. Section 4.2 provides that any plant of any species imported for the use in a tourist resort, picnic island, and marina shall be used or planted after obtaining written permission and in accordance with the instructions from the Ministry of Tourism, Arts and Culture. Particulars of trees so planted must be informed to the Ministry of	The replanting supports adaptation. The import of exotic species is regulated, and this assists adaptation in that it strengthens resilience of the existing ecosystem, if applied cautiously.	

		Tourism, Arts and Culture.		
	Regulation on Leasing Islands for Tourism Related Developments (Other Than Tourist Resorts) on Uninhabited Islands	Under this regulation, palm trees growing on uninhabited islands that were leased, can be cut down only with the permission of the Ministry of Tourism, Arts and Culture. Moreover, any other grown tree can be cut down with the permission of the Ministry as well.		
	Regulation on Uprooting Trees & Palms	Section 2 provides that palms and trees can only be cut down, uprooted or transported from one island to another, for essential purposes. For every palm/tree cut down, uprooted or transported out of that island, two more palms/trees must be planted in its place. Section 3 provides for the palms that are prohibited from being cut down and includes all palms found 15 metres inland from the palm		

		trees found at edge of the shoreline. All types of palms found within the 15 metres wide area surrounding mangroves and such places. All types of palms found in locations that the government has marked as environmentally protected areas. Types of palms safeguarded in order to protect species from getting endangered. Palms with unique characteristics.		
Building design (e.g. natural air flow) - Minimise use of air condition, but provide shaded areas with natural air flow - Consider best materials to minimise heat - Offer activities during less hot times during the day, e.g. morning and late afternoon	Maldives National Building Code (2008)[4]	Section G5.2.1 provides that buildings shall be constructed to provide: an adequate, controlled interior temperature, adequate activity space for the intended use, and accessible spaces and facilities. Section G5.3.1 provides that habitable spaces, bathrooms and recreation rooms shall have provision for maintaining the internal temperature at no higher	This legislation may facilitate adaptation; although the focus on 'controlled' interior temperature (indicating air conditioning) may prevent other more natural forms of air ventilation.	How to achieve an adequate interior temperature is not defined. The requirement to use air conditioning is an inhibiting factor as it does not encourage natural ventilation.

[4] At the time of writing this report, this Code have not been gazetted and therefore not an enactment or instrument with legal force.

		than acceptable level for habitation. Section G5.3.2 provides that habitable spaces shall have sufficient space for activity, furniture, and sanitation.		
Increased hygienic measures (as most bacteria thrive in warm conditions) - Food preparation, get advice from the Department of Health - Water storage	Maldives National Building Code (2008)	Section G12.3.1 provides that piped water supplies intended for human consumption, food preparation, utensil washing or oral hygiene shall be potable. Section G12.3.2 provides that piped water supply and outlets provided with non-potable water shall be clearly identified. Section G12.3.3 provides that sanitary fixtures and sanitary appliances shall be provided with hot water when intended to be used for: utensil washing, and personal washing, showering or bathing. Section G12.3.5 provides that water supply systems shall be installed in	Managing hygiene supports adaptation in the face of increasing temperatures and increasing risk of diseases.	

		a manner which: a) Avoids the likelihood of potable water contamination within both the system and the water main, b) Provides water to sanitary fixtures and sanitary appliances at flow rates which are adequate for the correct functioning of those fixtures and appliances under normal conditions, c) Avoids the likelihood of leakage, d) Allows reasonable access for maintenance of mechanical components, and e) Allows the system and any backflow prevention devices to be isolated for testing and maintenance. Section G12.3.7 provides that storage water heaters shall be capable of being controlled to produce, at the outlet of the storage water heater, an adequate daily water temperature to prevent the growth of Legionella bacteria.		

Energy efficient systems E.g. - Ocean thermal energy conversion - Thermal energy from AC exhaust vent to be used in resorts for heating water systems - Use of solar energy to benefit from renewable energy source to run air conditioning at zero emissions	Maldives National Building Code (2008)	Section H1.3 provides where any space within a building is intended to have a controlled temperature, construction of building elements affecting energy use shall take account of: a) Thermal resistance to heat loss through the building envelope, b) Heat gains (including solar radiation) through the building envelope, c) Air tightness, d) Control systems for cooling and ventilating.		Air conditioning is seen as a maladaptive measure as it increases greenhouse gas emissions; instead regulation should specify natural air flow and adequate building design or use energy efficient systems.

6.2 Plans and Frameworks

In addition to the above discussed laws, regulations, and policies governing environmental management in the Maldives, a series of plans and frameworks guide national planning and development. These documents were reviewed to analyse to find the extent to which climate change adaptation has been considered.

The review of the plans and frameworks shows that there is a time lag in the implementation of stated measures and future plans. For example, both the 2005 *National Recovery and Reconstruction Plan* (NRRP, 2005) and the *Third National Environmental Action Plan* (NEAP, 2009-2013) set a goal to develop a *National Disaster Management Plan / Policy*. The NEAP set a timeline for implementation for mid-2010. At the time of writing of this report, a *National Disaster Management Plan* had not been developed. Similar time lags have been noted in relation to the development of plans once outdated. The *Seventh National Development Plan* for the period of 2006-2010, for example, has not been superseded by an eighth plan for the period 2011-2016.

In contrast, in relation to waste management, the *National Public Waste Awareness Program: Framework for Action* was designed to assist the implementation of a policy relating to solid waste. In 2008, a *National Solid Waste Management Policy* for the Maldives was introduced, with the policy implemented as recently as 2013.

The *Fourth Tourism Master Plan* (2013-2017) that is currently in draft should be reviewed before implementation to take into account the legal barriers that impact upon climate change measures and lobby for change.

It is recommended that a new *National Development Plan* be developed with more appropriate time frames for plans to be achieved.

Table 7 outlines a review of plans and frameworks developed since 2005, and the planned legal reforms relevant to climate change adaptation in the tourism industry and tourism dependent communities, and a notation as to the implementation of the planned action.

Table 7: Plans and Frameworks

Plans /Frameworks	Date / Version	Document Category	Planned Legal Reforms Relevant to Climate Change Adaptation in the Tourism Industry	Actions Implemented
Strategic Economic Plan	2005	Plan	Not relevant	Not Applicable
National Recovery and Reconstruction Plan	2005	Plan	To develop a national policy for disaster risk management	A *Maldives National Disaster Management Bill* has been prepared; it is yet to come into force.
National Adaptation Plan of Action	2006	Framework	Improve building designs and regulations to increase resilience (6.1.1 (7)); Develop climate change adaptation policy and strategy for tourism (6.1.3(2)); Enforce the ban on coral mining (6.1.8 (1))	A *Maldives National Building Bill and Building Code* have been prepared but as yet to come into force. No climate change adaptation policy and strategy for tourism has been prepared. Although there are several regulations relevant to coral mining and extraction, there is not a total prohibition on coral mining. Permits can be granted by the relevant ministry.

Seventh National Development Plan 2006 – 2010 Note: No new plan has been development post 2012	2007	Plan	Strengthen the environment regulatory regime pertaining to tourism related products and facilities (4.1 – Tourism section); Develop new EIA regulation and implement them for all development undertaken in the Maldives (1.1 – Environment Management section); Develop policies, laws, regulations, guidelines and standards for biodiversity conservation (2.2 - Environment Management section); Strengthen policy, regulations and guidelines to improve integrated coastal zone management (4.2 - Environment Management section); Establish a legal framework for national disaster management (1.1 – Disaster Preparedness and Disaster Risk Reduction section); Develop land use plans and building codes to ensure safety of people and structures (3.2 – Disaster Preparedness and Disaster Risk Reduction section);	An *Environment Impact Assessment Report Compilation Regulation* (Regulation no: R-27/2012) is in force. A *Maldives National Disaster Management Bill* and *Maldives National Disaster Management Plan* has been prepared, it is yet to come into force. A *Water Bill* was presented to the parliament and rejected in June 2013.

			Enact the Water and Sanitation Act of the Maldives (4.1 – Water Resources Management section); Formulate and implement guidelines, regulations and quality control standards for drinking water, desalinated water, water consumption etc. (4.2 – Water Resource Management section)	
National Public Waste Awareness Program: Framework for Action	2007-2012	Framework	Implementation of a national strategy for waste management in the Maldives and developing and implementing a National Waste Management Policy.	*National Solid Waste Management Policy* for the Maldives implemented in 2008
Third National Environmental Action Plan	2009-2013	Plan	By 2010, incorporate climate change concerns into the land use planning laws, regulations and guidelines (2.3); By mid- 2010, develop National Disaster Management Plan and Mitigation Plan (7.1); By 2010, all Ministries review the legislative and regulatory frameworks under their jurisdiction to identify impediments to biodiversity conservation and incentives that encourage biodiversity loss (9.2); By 2012, Ministries remove the legislative and regulatory implements to biodiversity conservation (9.2);	A *Maldives National Disaster Management Bill* and *Maldives National Disaster Management Plan* has been prepared, it is yet to come into force.

			By mid-2010, develop the coral reef regulatory framework that enables the relevant institutions to designate zones, uses and marine protected areas systems (10.2);	
			By 2010, mechanisms are in place including land use planning regulations that prevent decline in the natural vegetation and communities as a result of land clearance (11.1);	A *Land Use Plan* *Maldives Land Act* (Law no. 1/2002) exists.
			By mid-2011, introduce effective regulations and land use planning guidelines to protect wetlands of national significance; (12.1);	
			By 2010, regulations are in place that control the clearing and removal of mature trees;	There are several regulations regulating the removal of mature trees.
			By mid-2010, develop regulations necessary to introduce levying of fees for waste management services and to enable private sector participation in waste management services (14.2);	*National Solid Waste Management Policy* for the Republic of Maldives implemented in 2008
			By 2011, develop policy on community rainwater management and develop protocols for use and	There are currently no policies located which regulate the use and

			management of tanks (18.1); By mid-2010, develop regulations and conflict resolution mechanisms for resource use among competing industries such as fishing and tourism to ensure balance between resource protection and usage (10.2); By 2010, propose recommendations to Attorney General to synchronise relevant environmental management (23.1).	management of rainwater. No information has been obtained relevant to these proposal
Millennium Development Goals – Report	2010	Goals / Plan	Specific regulations must be developed for governing areas such as independent power generation, as well as the pricing and use of renewable energy technologies (RETs).	No regulation has been prepared to date.
Fourth Tourism Master Plan 2013-2017 (Draft)	2012	Plan	Formulate an addendum to the National Building Code and incrementally change the Code to incorporate climate resilience in all new tourist resort developments (strategy 2.5 – implementing climate change adaptation program)	A *Maldives National Building Bill and Building Code* have been drafted but as yet to come into force.

7. Discussion and Recommendations

Findings of this project revealed that despite non-existence of laws, regulations addressing climate change adaptation, a wide range of laws and regulations already act in support of climate adaptation. While typically not designed as a climate change adaptation policy, the document analysis clearly identified substantial co-benefits of existing legislation, most notably in the area of environmental management.

At the same time, our analyses brought to light a range of policy gaps and disincentives in the regulatory framework which act as barriers to implementing or investing in climate change adaptation in the tourism sector. The analysis of gaps and disincentives has been a challenging task as there are a multitude of laws and regulations that are only indirectly relevant to climate change adaptation or the tourism sector.

This project revealed that there are no regulatory barriers to investing in climate change adaptation in the tourism sector of the Maldives. Concurrently this project also revealed a "reciprocally uncommitted tourism industry" (Weaver (2011, p. 5), unwilling to invest in climate change adaptation unless there was some financial return on their investment on the adaptive measures. A tax reduction on tourism goods and services tax for each dollar investment tourism industry makes on climate change adaption within the resorts and dependent communities is a feasible option to incentivise industry operators to address climate change.

As a developing country with a dynamic socio-political environment, the Maldives understandably is in a state of flux in terms of developing its regulatory framework. Unlike other countries, the layout of the country creates unique issues in terms of monitoring and enforcing regulated activities. The implementation of any regulation or any amendment to existing laws and regulation therefore requires consideration of key constraints, such as geographic spread and limited resources (both financial and human). Recommending regulatory reform based on or adopted from other nations has its limitations until such time as research is undertaken to determine the types of measures (regulatory or otherwise) that are suitable and applicable to the Maldives.

> "The State has a fundamental duty to protect and preserve the natural environment, biodiversity, resources and beauty of the country for the benefit of present and future generations. The State shall undertake and promote desirable economic and social goals through ecologically balanced sustainable development and shall take measures necessary to foster conservation, prevent pollution, the extinction of any species and ecological degradation from any such goals (Constitution of the Maldives, Clause 22)"

Notwithstanding these limitations, a number of high-level observations can be made. First, it is encouraging that the most recent amendments to the Constitution mandate that the State has a duty to protect and preserve the natural environment for the present and future generations. It is a positively imposed duty, requiring the State to take action to "*foster conservation, prevent pollution, the extinction of any species and ecological degradation* […]*"* The implementation of, or

amendments to any laws, should frame the objective of the law in a manner that accords with this State imposed duty.

Addressing climate change requires significant political will. Climate change adaptation policies must not be politicised with each electoral cycle and regime change that the Maldives goes through. Thus to have credible commitment to address climate adaptation, urgent priority needs to be given to develop a **Climate Act**, consolidating a legal framework specifically addressing climate change adaptation. Such constitutional reforms have been made in other countries such as the United Kingdom and Malta (see Table 12).

Both climate change and tourism are cross-cutting issues. They also touch on a wide range of government departments, which often have different mandates and priorities. Communication gaps, or even worse, policy conflict might be the outcome. To ensure an integrative approach in which tourism and climate change are represented across all necessary departments and non-governmental stakeholders, it is recommended that a **Climate Change Futures Commission** is established. This would be a dedicated group or taskforce that is responsible for developing and implementing a climate change adaptation strategy.

In New Zealand, a cross-departmental group was established in 2008 to address the problem of climate change. The group was led by the Ministry of Tourism, and also included the Ministry of Transport, Ministry of Foreign Affairs and Trade; New Zealand Trade and Enterprise, the Ministry for the Environment, and Tourism New Zealand (the marketing agency). In addition, the Tourism Industry Association, Air New Zealand and a tourism scientist were part of the group. The group met six-weekly to deal with acute issues, and a bit less frequently later for the development of a strategy (see New Zealand Ministry of Tourism, 2008).

While the strategy focused mainly on climate change mitigation of greenhouse gas emissions, and a poor image of New Zealand as a long-distance destination, two of the four priority areas and associated actions in the New Zealand Tourism and Climate Change Plan (New Zealand Ministry of Tourism, 2008) are related to strengthening three key aspects of the enabling environment, namely decision support, legislation/regulation and knowledge (see Table 8). In addition, the Plan allocates responsibilities to specific agencies or other institutions, identifies resource requirements and specifies the timing for implementation.

Table 8: New Zealand Tourism and Climate Change Plan: Priority Areas and Actions Related to Strengthening the Enabling Environment

(Source: New Zealand Ministry of Tourism, 2008)

Priority Area: Enable and ensure an ongoing response by tourism businesses	**Priority Area: Establish a forward research agenda for climate change and tourism**
Examples of specific actions: - enabling businesses to make good decisions on their response to climate change through information sharing and education; - align and enhance existing tourism environmental sustainability levers to include climate change; - address environmentally damaging tourism sector practices through regulatory measures when these practices pose unacceptable risks to tourism and cannot be resolved by other means.	Examples of specific actions: - prioritise research within existing science and tourism funding channels to identify physical impacts on New Zealand tourism from climate change effects for likely warming scenarios over time; - in parallel with physical impact research, identify adaptation issues, options, timings and costs that could be implemented by the sector to mitigate the physical impacts of climate change; - convene a process to identify the options and implications for New Zealand tourism should climate change concerns become significantly more acute.

Importantly, such a Plan would be more likely to be effective when explicit reference is made to other key components of the enabling environment, such as institutional strengthening and mobilisation of new financial resources. How implementation of the Plan will be monitored and evaluated against performance targets and indicators must be considered.

Consideration of the State imposed duty to protect and preserve the natural environment for the present and future generations has to some extent been reflected in the objectives or purpose of the more recent Bills that have gone before the Parliament. For example, section 2 of the MNDMB (2006) highlights the State's responsibility to protect, *inter alia*, the natural environment. Section 1 of the *Maldives National Building Bill* (2010) states that "*buildings are* [to be] *designed, constructed, and able to be used in ways that promote sustainable development*".

However, despite these enabling provisions, the analysis presented in this report revealed several systemic shortcomings. One relates to the long process involved in enacting legislation. The above mentioned MNDMB (2006) is a pertinent example of how important legislation fails to be enacted and therefore fails to be implemented. Another limitation of existing legislation, and a potential barrier to

effective climate change adaptation, is the often vague definition of key concepts (e.g. vegetation line) and the discretionary nature of legislation. Both make stringent implementation and enforcement challenging.

In the following, more specific discussions and recommendations are presented for adapting to the key climate risks analysed in this report.

7.1 Beach Erosion and Inundation

As discussed earlier in section 6.1.1, adaption measures at a resort, such as building hard structures in the water and sand pumping to replenish eroded beaches require permission to be granted by the MTAC prior to the carrying out of such activities. An impact assessment report must also be prepared prior to any construction of the activities outlined.

Section 9(2) of the current *Environmental Impact Assessment Regulation* (EIAR, 2007) requires substantive and predictive information on the proposed activity to be incorporated into the EIA report including, *inter alia*, measures proposed to mitigate adverse impacts. Schedule E of the EIAR details the contents of an initial environmental examination study or EIA study which includes identifying major and minor environmental impacts of the proposed and alternative measures to mitigate the adverse environmental impacts, and works involved and proposed mitigation measures to prevent negative impacts on water, coast, lagoon, and beach.

Although the requirement to seek permission and the requirement to prepare an EIA is noted as facilitating climate change adaptation, the granting of the activity inhibit adaptation, when the permitted measures act in a maladaptive way. For example, hard coastal protection, such as sea walls, has been discussed critically as a measure that might exacerbate erosion problems as it interferes with natural dynamics of ocean currents and sand movement (Mahon, Becken, & Rennie, 2012). Further, and as identified for other countries, (e.g. Fiji, Becken, 2005), EIA legislation has typically not been designed with climate change in mind, and is therefore not fully suited to proactively addressing climate change risks. We recommend that amendments to the EIAR consider future climatic risks, for example as projected in Hay (2006).

It is noted that the EIAR requires that the Ministry maintains a public register of applications under review and the decisions made. It is in fact maintained by the Environmental Protection Agency. It is our recommendation that an independent audit be undertaken to determine the nature and extent of these permitted activities in order to identify whether the provision under the RPCTI acts as a barrier to investing in climate change adaptation in the tourism sector. Apparently, such an audit is on its way, but it is not clear whether the audit will consider climate change specific concerns.

Island and City Councils are positively obligated under the *Act on Decentralisation of the Administrative Division of the Maldives* (Law no. 7/2010) to take measures to alleviate land erosion problems in the various jurisdictions. The

provisions however do not provide certainty as to the type of measures and arrangements that should be employed by the various Councils. We recommend that research be undertaken to identify the most appropriate measures that could be implemented at the local level to mitigate against coastal erosion. This may include research into soft measures (e.g. vegetation) or 'living with erosion' (i.e. by embracing natural fluctuations in sand around an island).

In relation to un-built space, the RPCETI requires that 80% of any island from the vegetation line be spared un-built. Although this is a facilitating measure, the term vegetation line is not sufficiently defined. It is recommended that the regulation is reviewed and a more detailed interpretation or definition section included. There is also a risk that the demand for further tourism development (e.g. increase in accommodation capacity) cannot be met due to space limitations on the island resort. This might then instigate developers and operators to further build facilities off-shore; for example, over-water bungalows and under water facilities. These are at greater risk of high seas and extreme weather events, compared with land-based structures. Also, further investigations into detrimental effects of water-based structures on coral reefs, lagoons, and beach integrity would be warranted to avoid increased climate vulnerability. Specific recommendations are outlined in Table 9.

Table 9: Recommended Adaptation Measures Against Beach Erosion and Inundation

Laws, Regulations, and Policies	Inhibitor	Recommendations
Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	The construction of structures on the beach or lagoon, interference with the natural shoreline, dredging, and hard structures have all proven to pose serious challenges to the long term integrity of coastal (and shoreline) systems.	Building hard structures in the water (e.g. sea walls or groynes) although used as a common adaptation measure is found to be maladaptive in that it often leads to increased erosion elsewhere (e.g. at the ends of the seawall) and is therefore not always recommended. Instead soft measures (temporary) such as sand bags to stabilise sand and avoid beach sediment washing away is recommended.
	Section 24 is ambiguous as measures to alleviate erosion could either be adaptive or maladaptive.	Sand pumping to replenish eroded sand (often done in the night time) currently practiced in the tourism industry is a maladaptive practice and needs to be controlled and monitored.
	In addition, enforcement and critical assessment of requests is important and not specified. Further, this poses a risk that the policy is not effective.	An independent audit of current EIAs approved for resort development, and it's effectiveness in environment protection of the country is recommended. (Apparently such an audit is under way). Enforcement and monitoring for compliance through policing is necessary to assure effectiveness of policy implementation, and to assure compliance with existing laws and regulations.

	The RPCETI requires that 80% of leased island for resort development needs to be left undeveloped from the vegetation line. The vegetation line is insufficiently defined and lack of consideration of island-specific factors (e.g. bathymetry, beach profile etc.) is likely to lead to maladaptation or insufficient protection.	The RPCETI needs to be revised with clear definition of terms. Better enforcement of regrowth of natural vegetation, e.g. planting of coastal vegetation or avoiding damage to existing vegetation such as dune grasses or mangroves. Keep distance of buildings from the beach by implementing a minimum distance away from the high tide mark. Only have temporary (or not so costly) structures closer to the beach. By doing so, increase buffer zone in coastal environment as a climate risk reduction mechanism (e.g. as practiced in Fiji & Australia). Structures close to the beach are more vulnerable to eroding shorelines, and may exacerbate erosion through human intervention (e.g. construction work). This increases damage the natural stability of the coastal system, and thus coastal development needs to be controlled. Strengthen EIAR policy, regulations and guidelines to improve integrated coastal zone management.

Act on Decentralisation of the Administrative Divisions of the Maldives (2010)	Section 24 provides that the **island council** shall provide municipal services to the people of the island in which the council was constituted; in accordance with the powers and responsibilities stated in Article 23 of this Act including: (d) In accordance with the Law of the Maldives, take necessary measures to alleviate the land erosion problem and maintain the jetty and the breakwater of the island. Currently finance generated within the LGAs is deposited to MMA. Time lag between erosion and funds needed to take adaptive actions further aggravate existing problems within local island environment.	While this is theoretically a positive adaptation mechanism, in practice the local government authorities are not independent from the central government. It is therefore recommended that island councils and atoll councils be given institutional and technical capacity to tackle climate risks facing the islands. This requires financial independence to an extent from the central government, as well as technical knowledge and know-how to be developed within island communities. To do this, it is crucial that those with technical knowledge be utilised.
Maldives Tourism Act (1999; 2010) Dredging and Reclamation Regulation (Regulation No: R-15/2013) Environmental Impact Assessment Regulations (2012)	The option of obtaining a permit for dredging poses a risk for climate change adaptation.	Strengthen the environment regulatory regime pertaining to tourism and dependent communities. Formulate and revise an addendum to EIAR to include climate change adaptation and resilience. Limit or ban lagoon dredging.

7.2 Coral Reef and Marine Life

The protection of coral reefs is an important component of successful climate change adaptation. Healthy coral reefs act as protective barriers to storm surges, tsunamis and high seas as a result of extreme weather events. The environmental condition of coral reefs is also a critical component of the Maldives tourism product. A number of regulations already facilitate good practice for diving and snorkelling, especially in trying to influence environmentally sound tourist behaviour. Although a number of interview respondents raised concerns regarding compliance, especially with the new Chinese tourist market, the overall framework is relatively detailed. Prior to any amendments of these regulations, it is recommended that independent research be undertaken to determine the most effective mechanism to achieve compliance. Such research would explore underlying causes (e.g. cultural practices, interpretations of nature) of tourist behaviour, which provide a pathway for environmental education and behavioural change. Implementing prohibitions or severe penalties may not achieve the warranted result if the reasons for non-compliance are not examined.

Water pollution is an important threat to coral reefs, and effective pollution control is therefore critical. The provisions outlined in the RPCETI relating to the disposal of sewage into the water, whether treated or untreated, are ambiguous. Also lacking is a clear definition (including parameters) within the regulations of what constitutes a lagoon, the sea and mid-ocean. The RPCETI provides an assortment of regulations relating to where the sewage water can and cannot be pumped. We recommend that the regulations be amended prohibiting the disposal of any untreated sewage into the water and that only sewage that has been comminuted and disinfected (treated) should be disposed at a specified distance (e.g. longer than 3 nautical miles) from the nearest land.

Waste management is equally important, due to its direct impacts on the quality of both the land and marine environments. The RPCETI allows for the food and biodegradable waste to be dumped into the ocean in the absence of a designated area. Prohibition of organic waste or sewage dumping into sea by tourism resorts, safari operators, and local communities is recommended. Composting organic waste and growing of vegetables is recommended. It is further recommended that more research is undertaken into the detrimental effects on marine life as a result of the current practice of dumping waste into the ocean (e.g. changes in the marine environment and food chain).

Previous research indicates that tourism generates more waste than locals. To address waste management, RPCETI (5.3.1) requires tourist resorts to have waste incinerators. This presents as a maladaptive measure. These operations increase energy consumption and emissions. Therefore, it is recommended that each atoll within which resorts operate have an established solid waste disposal centre. The best approach in which the resorts would use these facilities needs investigation.

Conservation measures help maintain and enhance the integrity of island ecosystems. This is important for ecological resilience; which in turn supports the

effectiveness of climate change adaptation measures. In relation to the extraction of coral stones from the lagoons, there is inconsistency within the regulations. The RPCETI prohibits the extraction of coral stones for any purpose relating to the leasing of an island for tourism development or for the renovation or repair of jetties. The same legislation, as well as the *Regulation on the Mining of Stone, Sand and Coral,* and *Law on Stone, Sand and Coral Mining in Inhabited Islands* (Law no. 77/78), however, provides that stones can be mined with permission obtained from the local government authority. Thus, there is a clear inconsistencies between regulations.

It is recommended that an independent audit be undertaken to identify the nature and extent of the permitted mining. If coral mining is deemed as an essential activity, research should identify those sites (and potential rotation patterns) where environmental impacts are minimised. A similar approach is proposed for the assessment of environmental effects of *Dredging and Reclamation Regulation* (Regulation No: R-15/2013). Particular attention should be paid to the potential risk of increased sensitivity to high waves and extreme weather effects as a result of changed coastal dynamics. In sum, the extent of the mining and the impact upon the natural coral environment needs to be known in order to formulate more effective regulatory measures.

It is further recommended that taxation on imported material for home construction and the current subsidy given to local communities for electricity is abolished. This should be replaced with a government subsidy on house construction materials. This would alleviate the current demand for marine material for construction purposes. This change would also encourage energy efficient practices among local communities.

Table 10: Recommended Adaptation Measures against Degradation of Coral Reefs and Marine Life

Laws, Regulations, and Policies	**Inhibitor**	**Recommendations**
Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	No regulation on actions to be taken against tourist who damage the environment. No definition of what is meant by least impact or how it is to be monitored and enforced. Section 7.6 revokes section 7.5 and allows sewage pumping into the lagoon. This is a maladaptive practice.	To conserve the environment, difference between locals and tourists breaking the laws should not be made. Appropriate penalties need to be considered and applied to tourists who do not comply with the regulations. Education and awareness raising for diver/snorkeler (both tourists and employees): (only look don't touch). Consider the establishment of Volunteer Tourism, where tourists contribute to clean ups or conservation activities. Protection of coral reefs (e.g. conservation programmes) as healthy reefs will also protect the shore from storm surges and wave erosion, several measures possible: - Diversify tourism product from marine based to other forms (such as cultural) of tourism - Establish no-dive zones - Establish number of dives per site per day - Follow rotating schedule for visiting

		different dive places taking into consideration stress factors at site Waste management: Prohibit organic waste or sewage dumping into sea by tourism resorts, safari operators, and local communities (even dumping of organic waste not ideal as it modifies food chain). Encourage collaborations between resorts and tourism-dependent communities on waste management. Composting on island to reduce waste and allow growing of vegetables (reduces fuel requirements for transport, a win win measure). Minimise packaging to reduce waste. Minimise use of plastic water bottles to reduce plastic waste; change to re-fillable glass bottles. Encourage tourists to take home non-organic or harmful waste (e.g. Batteries).

Maldives Tourism Act (Law no. 2/99) incorporating amendments (Law no. 20/2010)	The permission to anchor appears to relate to revenue raising and not to monitoring of anchoring in sensitive places.	Change anchoring practices. No anchoring of boats/safari boats. Buoys to be provided for mooring within designated safari operation zones.
Maldives Fisheries Act (1987) Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006) Regulation on the Mining of Stone, Sand and Coral Law on Stone, Sand and Coral Mining in Inhabited Islands (Law no. 77/78)	The option of obtaining a permit for sand/coral mining poses a risk for climate change adaptation.	Reduce tourism pressure on other marine resources. Conservation project (e.g. coral growing programmes, breeding of corals and transplanting into sea as a seed for reef formation). Prohibit coral sand mining. To meet resource demand for construction materials instead of subsidy currently given to local communities towards the energy bills, eliminate import tax on imported construction materials and provide a government subsidy for local communities for building materials. This act two ways: a) it encourages energy saving practices among locals,; b) it reduce community dependence on coral, sand, stone harvesting and cutting down of trees for construction.

7.3 Extreme Weather Events

Irregular rainfall and periods of drought are an important climate risk to the Maldives. Water supply is therefore an important issue for tourism providers. The regulations require that every tourist resort install a desalination plant for the purpose of clean and safe water. The installation of desalination plants as outlined in Table 6 is both adaptive and maladaptive. It is prudent to install a desalination plant to ensure enough water is available in times of drought. The installation of these plants, however, contributes to increasing energy use and greenhouse gas emissions. It is recommended that regulations be implemented or amended to ensure more efficiency in terms of water use. For example, the *National Building Code* (2008) should require that all developments install water saving devices. Regulations should also be introduced requiring tourist resorts to install rainwater harvesting systems. More research into both technologies and management practices for water use by tourist resorts is recommended. This should generate tangible information for operators on investment costs, returns on investment, and customer impacts (positive and negative).

The occurrence of extreme events (and other natural disasters such as a tsunami), make it necessary that businesses have plans in place to deal with emergency situations. Evacuation procedures are an important component of such plans. Both the MNDMB (2006) and the *Building Code* have introduced measures in relation to the evacuation procedures. Unfortunately neither the code nor the MNDMB have been implemented. However, based on interview data, tourist resorts have to provide life jackets for every tourist on the island. This is a requirement of international tour operators who sell the Maldives tourism product. This 'international policy' is an excellent example of how international expectations of safety exceed current national standards. This is not a favourable position for the Maldives, and it is suggested to ensure that future regulations accommodate international concerns.

The MNDMB requires the implementation of management and emergency plans and a number of programs relating to disaster risk reduction, mitigation, preparedness, response, relief and recovery, post-disaster assessment, research and policy and governance. It is unknown as to reasons why this Bill has not yet come into force some seven years after the Bill was presented to the Parliament. It is of critical importance that the Bill both in its current form or an amended version is passed and enacted. The plans and programs outlined must be prepared and implemented in a timelier manner to safeguard the country and its people and visiting tourists from any future disasters.

Ensuring that the islands provide enough shade from trees is a facilitating climate change adaptation measure for the tourism sector. There are a number of regulations prohibiting the felling of trees including palm trees and huge, aged or rare trees. Exemptions to these prohibitions apply however if written permission is granted. Again, it would be worthwhile investigating the nature and extent of the felling of trees with permission in order to determine the adequacy of the regulations. It is recommended that more certainty be given to the definition of a huge, aged and

rare tree. The RPCETI should incorporate a schedule within the regulation detailing the types of trees that are considered rare (i.e. tree species), the dimensions of trees considered huge and specific details relating to tree age. Definitive criteria may assist in ensuring compliance with the regulations.

Building design regulations which minimise the use of air conditioning and encourage the flow of natural air and materials that minimise heat are facilitating adaptation measures. The *National Building Code* (2008) has to some extent achieved this goal by ensuring internal temperatures are at an acceptable habitation level. However, the Code does not promote measures that result in natural forms of ventilation. This could be achieved by requiring building design and building products to be used to maximise the natural air flow. The use of air conditioning is not discouraged in the Code. There is also definition uncertainty for the term adequate. Amendments should be made to the Code which gives more specificity to temperature controls.

Although safety measures have been considered in the *National Building Code* (2008), there appears limited regulation in relation to ensuring that sustainable building materials and products are used and there is limited regulation relating to tourism developments constructed in over and under the water. We recommend that research be undertaken to identify the types of building materials and products that facilitate climate change adaptation measures for incorporation into the Code. The *Act on Decentralisation of the Administrative Division of the Maldives* (Law no. 7/2010) requires the implementation of *Maldives Land Use Plan* which is in place. However, none of these regulatory policies consider tourism infrastructure constructed over and under the water. Furthermore, the *Maldives National Building Bill* (2010) and its associated *National Building Code* (2008), has not been enacted and therefore has no legal force. These regulations need to be gazetted and enforced to assure reducing risks stemming from climate change facing both tourism sector and the dependent communities.

Many of the activities subject to regulatory control that were relevant to this project require the permission or authority of relevant ministries prior to the activity being undertaken. The apparent subjectivity and discretion afforded under these regulations makes it difficult to determine whether the regulatory provisions act as barriers to climate change adaptation in the tourism sector and its dependent communities. Further research would need to be undertaken to determine whether internal guidelines or policies exist in the respective ministries to guide any application process prior to the permission being granted. The nature of the activities, the frequency of the granting of permission, and the types of conditions imposed for these activities are vital in order to understand whether or not the regulation is sufficient. It is recommended that an independent audit be undertaken to determine the effective implementation of these plans in addressing climate adaptation.

Table 11: Recommended Adaptation Measures against to Protect Against Extreme Weather Events

Laws, Regulations, and Policies aligned with measure	**Inhibitor**	**Recommendations**
Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006) Desalination Plant Regulation (2002)	Desalination plants are classified as maladaptive because they contribute to increasing energy use and greenhouse gas emissions; thus exacerbating the risk of climate change.	Regulation for water saving should be developed. Reduce dependence on desalinated water by using dual flush toilets or use a dual system where salt water or rain water is used. Reduce resort linen change patterns (instead of every day, change bed linen every other day; educate guests to reuse towels). Recirculation of recycled water to irrigate garden areas also helps to further filter water and reduce sewage load into ocean. Plant vegetation that is draught resistant and adapted to the climatic and soil conditions and does not require excessive irrigation. Increase water storage by establishing rain water tanks beneath structures (e.g. tennis courts). Capturing of rain water by building rainwater storage

		tanks; need to consider hygienic issues for storing water. Enact legislation specifically dealing with water management and efficiency. Formulate and implement guidelines, regulations and quality control standards for drinking water, desalinated water, and water consumption.
Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)	Permits over water constructions (e.g. water villas)	Lease of islands that are large enough (avoid islands that are so small that there is no buffer zone between sea and land). Increase buffer zone in coastal environment as a climate risk reduction mechanism. (E.g. Fiji & Australia), or proactive rehabilitate existing buffer zones. Also consider greater use of coral regeneration. Build critical infrastructure (e.g. power houses) in the middle of the island. Formulate and revise an addendum to the RPCETI to prohibit over-water / under water structures. Over-water / under water structures are more prone to risks of climate change than those on developed on land.

		Formulate and revise an addendum to the RPCETI to incorporate climate change concerns into the land use planning laws, regulations and guidelines.
Maldives National Disaster Management Bill 2006[5]	No specific reference to tourism and tourists is made which means that the full adaptive potential may not be exploited.	The *Maldives National Disaster Management Bill* needs to be enacted and management plans drafted and implemented. Communication between departments needs to be improved; one avenue could be the e-Gov system. The *Building Code* must include improved building designs to increase resilience to climate risks and to ensure safety of people and structures. Evacuation procedures - Have a clear evacuation plan and provide signage for guests - Staff training - Execute drills regularly - Multi-hazard planning (e.g. fire, tsunami, strong wind etc.) - Have first aid kits at hand

[5] At the time of writing this report, this Bill have not been gazetted and therefore not an enactment with legal force.

		- Ensure emergency supplies (water and food) - Life jackets for guests and employees (either in rooms or available elsewhere) - Weather information routines - Check weather forecasts and warnings daily - Develop policies for dealing with warnings - Consider seasonal forecasts - Provide safe harbours for safari *dhonis* within the major safari operation zones - Business continuity plan - Have contact tree to be in touch with relevant stakeholders, community members, Government representatives etc. Have a communication plan for overseas wholesalers, travel agents, airlines etc.
Insurance Industry Regulations (2002)	Does not require compulsory insurance	Require mandatory insurance cover for various hazards beyond merely contractual arrangements as part of the lease. Standardise rules for insurance and clarify to what extent climate risks are considered.
Maldives National Building Code (2008)[6]	A definition of adequate is missing; this may inhibit adaptation. Air conditioning is seen as a maladaptive	Building design (e.g. natural air flow) - Minimise use of air condition - Encourage natural air flow and cooling - Consider best materials to minimise heat

[6] At the time of writing this report, this Code have not been gazetted and therefore not an enactment or instrument with legal force.

	measure as it increases greenhouse gas emissions	- Instead regulation should specify natural air flow and adequate building design Offer activities during less hot times during the day, e.g. morning and late afternoon - Energy efficient cooling systems (e.g. Ocean thermal energy conversion - Thermal energy from AC exhaust vent to be utilised for heating water systems - Use of solar energy to benefit from renewable energy source to run air conditioning at zero emissions - Modify laundry operating hours to low energy consumption times, reduces operating multiple power generators (saves $ on energy cost) Encourage tourism operators to adopt renewable energy technologies and climate investment, possibly through a tax off-set program. Increased hygienic measures (as most bacteria thrive in warm conditions) - Food preparation, get advice from the Department of Health

7.4 Overview of Laws and Policies in Other Countries Impacting Climate Change Adaptation

It is useful to investigate what other countries and destinations are doing in terms of climate change adaptation policy for tourism. This could provide insight into current practices, or even best practices, and provide impetus for policy development or adjustment. However, it is also important to emphasise that every country is different and characterised by a unique mix of geography, culture, and policy-making context. Thus, it is not advisable to transfer a set of laws from one context to another without critically examining the ‘fit for purpose’.

The following table provides some examples of laws and policies that are relevant to climate change adaptation. The purpose of the laws and policies is summarised briefly and a reference for further information is provided (Table 12).

Table 12: Overview of Climate Change Adaptation Laws and Policies in Other Countries

(See also Becken & Hay, 2012)

Country	Purpose of the Policy	Type of Policy	Further Information
United Kingdom	Climate Act sets a target for the year 2050 for the reduction of targeted greenhouse gas emissions; to provide for a system of carbon budgeting; to establish a Committee on Climate Change; to confer powers to establish trading schemes for the purpose of limiting greenhouse gas emissions or encouraging activities that reduce such emissions or remove greenhouse gas from the atmosphere; to make provision about adaptation to climate change; to confer powers to make schemes for providing financial incentives to produce less domestic waste and to recycle more of what is produced; to make provision about the collection of household waste; to confer powers to make provision about charging for single use carrier bags; to amend the provisions of the Energy Act 2004 about renewable transport fuel obligations; to make provision about carbon emissions reduction targets; to make other provision about climate change; and for connected purposes.	Climate Act	Government of the United Kingdom http://www.legislation.gov.uk/ukpga/2008/27/contents
Saint Lucia	Address climate risks to tourism and seven other sectors. The policy has a focus on strengthening the enabling environment for adaptation.	National Climate Change Adaptation Policy	Government of Saint Lucia (2003) Saint Lucia National Climate Change Adaptation Policy and Strategy. Ministry of Physical Development, Environment and Housing, Government of Saint Lucia, Castries, Saint Lucia, 35pp.

	The strategy is intended to serve as a blueprint for implementation of the above Policy. The Strategy is divided into a number of components, each of which corresponds to a sector under the Policy, including tourism.	National Strategy for Adaptation to Climate Change	http://climatechange.planning.gov.lc/NCC_Policy-Adaptation_7April2003.pdf
New Zealand	Develop an inter-governmental strategy for dealing with climate change (both mitigation and adaptation)	Strategic document (advisory guideline)	New Zealand Ministry of Tourism. (2008). New Zealand Tourism and Climate Change Plan. Retrieved September 11, 2009, from http://www.tourism.govt.nz/Our-Work/Our-Work Summary-page/Climate-Change/
Jamaica	National development plan that provides a framework designed to ensure that climate change issues are mainstreamed into national policies and development activities.	Vision 2030 Jamaica	Jamaica Tourism Task Force (2009) Tourism Sector Plan, 2009 – 2030. Tourism Sector Plan for Vision 2030 Jamaica, Tourism Task Force, Kingston, Jamaica, 97pp. http://www.vision2030.gov.jm/
Germany	Creates a framework for adaptation to the consequences of climate change. Water regime and management, coastal and marine protection and tourism are identified as important areas for action.	German Adaptation Strategy	BMU: http://www.bmu.de/files/english/pdf/application/pdf/das_gesamt_en_bf.pdf
Samoa	Climate change is considered an extreme risk; the response strategy is to ensure accurate identification of potential changes in the physical environment due to	Samoa Tourism Development Plan (2009-	Samoa Tourism Authority, 2009

	climate change and to factor these into planning and development decisions; but no are no proposed actions to address these risks.	2013)	
Queensland, Australia	The main objects of this act are to: provide for the protection, conservation, rehabilitation and management of the coastal zone, including its resources and biological diversity; and have regard to the goal, core objectives and guiding principles of the National Strategy for Ecologically Sustainable Development in the use of the coastal zone; ensure decisions about land use and development safeguard life and property from the threat of coastal hazards; and encourage the enhancement of knowledge of coastal resources and the effect of human activities on the coastal zone.	Coastal Protection and Management Act 1995 (Qld)	https://www.legislation.qld.gov.au/LEGISLTN/CURRENT/C/CoastalProtA95.pdf
Queensland, Australia	The main purpose of this Act is to provide for conservation of the marine environment. The purpose is to be achieved by a comprehensive and integrated strategy that involves, among other things: the declaration of marine parks; the establishment of—zones, designated areas and highly protected areas within marine parks; and zoning plans and management plans; and the cooperative involvement of public authorities and other interested groups and persons.	Marine Parks Act 2004 (Qld)	https://www.legislation.qld.gov.au/LEGISLTN/CURRENT/M/MarinePA04.pdf
Queensland, Australia	The purpose of this Act is to provide for the safety and reliability of water supply. The purpose is achieved primarily by providing for a regulatory framework for	Water Supply (Safety and Reliability) Act	https://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WaterSupSRA08.pdf

	providing water and sewerage services in the State, including functions and powers of service providers; and a regulatory framework for providing recycled water and drinking water quality, primarily for protecting public health; and flood mitigation responsibilities.	2008	
Queensland, Australia	The purpose of this policy is achieved by identifying environmental values and management goals for Queensland waters; and stating water quality guidelines and water quality objectives to enhance or protect the environmental values; and providing a framework for making consistent, equitable and informed decisions about Queensland waters; and monitoring and reporting on the condition of Queensland waters.	Environmental Protection (Water) Policy 2009	https://apps.legislation.qld.gov.au/Search/isysquery/c3f5503b-e9b1-457b-b42f-9ca0425edcbf/9/doc/EnvProWateP09.pdf#xml=https://www.legislation.qld.gov.au/Search/isysquery/c3f5503b-e9b1-457b-b42f-9ca0425edcbf/9/hilite/
Sunshine Coast, Australia	While many of the actions identified in the Action Plan will be undertaken using existing resources and budget allocations, in other cases actions will be subject to Council's annual budget process or may be funded through the Environment Levy.	Sunshine Coast Climate Change and Peak Oil Strategy (2010-2020)	Sunshine Coast Council (2010a) Climate Change and Peak Oil Strategy. Available at: (24/11/2010) http://www.sunshinecoast.qld.gov.au/sitePage.cfm?code=cc-strategy
Great Barrier Reef, Australia	Protect the reef and build resilience.	Great Barrier Reef Tourism Climate Change Action Strategy 2009 – 2012	http://www.gbrmpa.gov.au/__data/assets/pdf_file/0009/3987/gbrmpa_CCActionStrategyFull_2011.pdf
India	Improving sustainability of hotels and water efficiency.	Guidelines for	Ministry of Tourism (2012). Annual Report

	Specifies that new hotel constructions are to include eco-friendly practices, including sewage treatment and rain water harvesting.	classification/re-classification of hotels issued by the Hospitality Development and Promotion Board, the Ministry of Tourism in India	2010-11. Government of India: New Delhi.

8. Conclusions

This project set out to 'identify gaps and disincentives that exist in the laws, regulations, and policies which act as barriers to investing in climate change adaptation in the tourism sector of the Maldives'. This project established that there are no specific laws and regulations which address climate change in the country. Concurrently, a number of positive and negative aspects of existing laws, and regulations addressing environmental management were identified.

A key concern of these laws were that while at one hand environmental endangering activities are implicitly prohibited, a clause in the same law/regulation allows the activity to be carried out upon obtaining an approval from a regulatory body. Regulatory instruments must not include vague statements, giving power to one public office (or the same power to two different authorities). Current instruments which act as laggard to climate change adaptation need urgent revision. Moreover, these regulatory instruments must be legally enforced, and monitored for adherence.

We encourage a more researched and consultative approach to the implementation of any law, regulation or policy relating to the climate change adaptation in the Maldives. One potential avenue would be to institute a **Climate Change Futures Commission** who can monitor climatic conditions in the country, consult with the relevant agencies and ministries, local communities, and advise on aspects of the legislation and regulations which impact climate change adaptation measures.

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Appendices:

Appendix 1: Documents Reviewed

1. Constitution of Maldives
2. 'Increasing Climate Change Resilience of Maldives Through Adaptation in the Tourism Sector' (TAP) Documents and other Relevant Reports and Studies conducted in the Maldives that has relevance to the Goals and Objectives of the TAP
3. Act Governing Vessels that Sink or Ground at Sea (Law no. 7/96)
4. Act on Decentralisation of the Administrative Divisions of the Maldives (Law no. 7/2010)
5. Business Profit Taxation Act (Law no 5/2011)
6. Civil Aviation Act (Law no. 2/2001)
7. Civil Aviation Regulations – Protection of the Environment
8. Desalination Plant Regulation (2002)
9. Dive School Registration Procedure
10. Dredging and Reclamation Regulation (2013/R-15)
11. Duty Exemption Act (Law no. 5/80)
12. Environment Impact Assessment Report Compilation Regulation (R-27/2012)
13. Environment Impact Assessment Report Compilation Regulation Amendment (R-18/2013)
14. Environment Law and its Regulations Booklet 2006
15. Environmental Damage Fine Regulation (2011/R-9)
16. Environmental Impact Assessment Regulations (2012)
17. Environmental Impact Assessment Regulations, First Amendment (2012)
18. Final Technical Specification for Sewerage Systems (Gravity System)
19. Final Technical Specification for Water Supply
20. Finance Act (Amendment 2 to Law no. 3/2006 – 8/2012)
21. Finance Act (Amendment 3 to Law no. 3/2006 – 2/2013)
22. Finance Act (Law no. 3/2006)
23. Finance Regulation
24. Fourth Tourism Master Plan 2013-2017 (Draft 1)
25. Goods and Services Taxation Act (Law no. 10/2011)
26. Guesthouse Operation Permit
27. Guideline for Preparation of Disaster Management for Tourist Accommodating Vessels (Draft)
28. Hotel Registration Procedure
29. Insurance Industry Regulations (2002)
30. Interpretation Act (Law no. 4/2001)

31. Lagoon Zoning Regulation of Leased Islands for Development of Tourist Resorts, Tourist Hotels, Tourist Guesthouse and Yacht Marina (Regulation no: R-17/2012)
32. Land Transportation Act (Law no. 5/2009)
33. Land Use Plan
34. Law on Foreign Trade in Maldives (Law no. 4/79)
35. Law on Stone, Sand and Coral Mining in Inhabited Islands (Law no. 77/78)
36. Law on Trade (Law no. 6/91)
37. Maldives Banking Act (Law no. 24/2010)
38. Maldives Environment Protection And Preservation Act (Law no. 4/93)
39. Maldives Fisheries Act 5/87
40. Maldives Foreign Investments Act (Law no. 25/79)
41. Maldives Import Export Act (Law no. 31/79)
42. Maldives Land Act (Amendment 2, Law no. 4/2008)
43. Maldives Land Act (Law no. 1/2002)
44. Maldives Monetary Authority Act (Law no. 6/81)
45. Maldives Monetary Regulation 1987
46. Maldives National Building Bill (Second draft, 2010)
47. Maldives National Building Code (2008)
48. Maldives National Disaster Management Bill (Draft, 2006)
49. Maldives Recreational Diving Regulation (2003)
50. Maldives Tourism Act (Amendment 2; 20/2010)
51. Maldives Tourism Act (Amendment 3; 5/2012)
52. Maldives Tourism Act (Law no. 2/99)
53. Maldives Uninhabited Islands Act (Law no. 20/98)
54. Maritime Act (Law no. 69/78)
55. Millennium Development Goals - Maldives Country Report (2010)
56. National Adaptation Plan of Action (2006)
57. National Public Waste Awareness Program 2007-2012: Framework for Action
58. National Recovery and Reconstruction Plan
59. Petroleum Companies Taxation Act (Law no. 1/89)
60. Policy on Government Investments and Leasing of Islands
61. Protection of Trees Act (Law no. 12/2011)
62. Regulation Governing Foreign Tourist Vessels Cruising and Harbouring In Maldivian Waters (1st-Amendment)
63. Regulation on Guest House Operation
64. Regulation on Lease Rent Payment (2010/R-20)
65. Regulation on Lease Rent Payment (3rd Amendment, 2013/R-2)

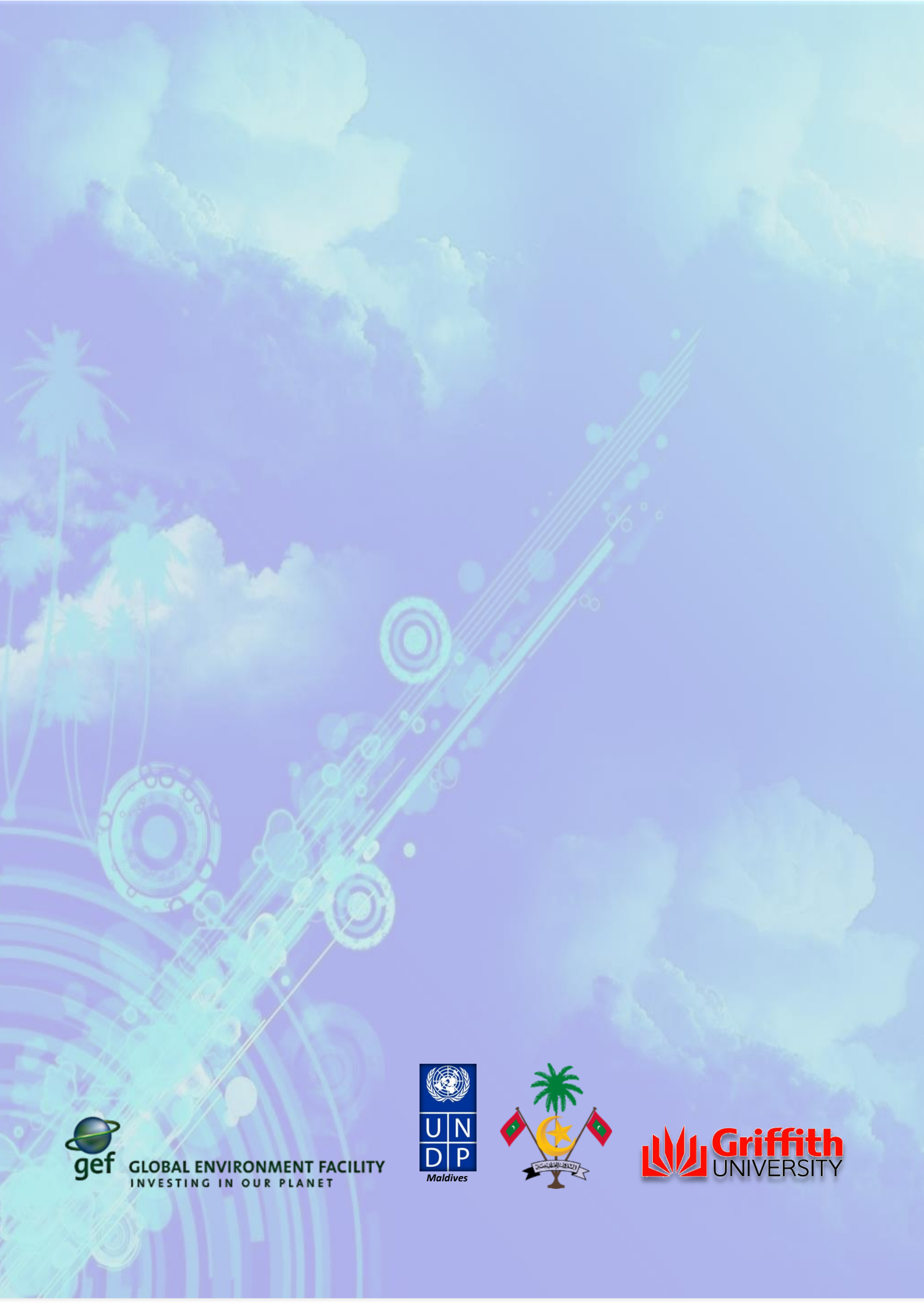
66. Regulation on Leasing Islands for Tourism Related Developments (Other Than Tourist Resorts) on Uninhabited Islands
67. Regulation on Payment of fees for the Extension of the Period of Lease of Tourist Resorts (2010/R-7)
68. Regulation on the Mining of Stone, Sand and Coral
69. Regulation on the Protection and Conservation of Environment in the Tourism Industry (2006)
70. Regulation on Tourism Related Developments on Uninhabited Islands
71. Regulation on Uninhabited Islands
72. Regulation on Uprooting Trees and Palms
73. Regulation on Use, Managing, and Control of HCFC, and Products Containing HCFC (2010)
74. Regulations on the Protection and Conservation of Environment in the Tourism Industry
75. Resort Boundary Regulation (2012/R-7)
76. Resort Registration Procedure
77. Safari Vessel Registration Procedure
78. Seventh National Development Plan 2006-2010
79. Small to Medium Scale Entity Business Act (Law no. 6/2013)
80. Solid Waste Management Project – Ari Atoll (Draft)
81. Strategic Economic Plan (2005)
82. Travel Agency Registration Procedure
83. Yacht Marina Regulation (2005)

Appendix 2: Stakeholder Interview List

Name	Position	Office	Sector
Mr Abdulla Nishaad	Councillor	Alif Alif Rasdhoo	Council
Mr Abdul Kareem	Councillor	Malé City Council	Council
Dr Ali Shareef	Dean	Faculty of Education	Education
Dr Mizna Mohamed	Research	Maldives National University	Education
Mr K. Subrahmanyam	Consultant, Insurance Division	Maldives Monitory Authority	Financial Sector
Ms Aishath Wafa	Assistant Manager, Insurance Division	Maldives Monitory Authority	Financial Sector
Mr Ahmed Jamal	Assistant Manager, Insurance Division	Maldives Monitory Authority	Financial Sector
Mr Ahmed Ali	Director	Climate Change and Energy Department	Government
Mr Amjad Abdulla	Director General	Climate Change and Energy Department	Government
Ms Fathimath Thasneem	Deputy Minister	National Disaster Management Centre	Government
Ms Najfa Shaheem Razee	Project Manager	Climate Change and Energy Department	Government
Mr Hussain Naeem	Senior Technical Officer	Climate Change and Energy Department	Government
Dr Zahid	Climatologist	Maldives Meteorological Service	Government
Mr Ali Shareef	Assistant Director	Ministry of Environment and Energy	Government
Mr Zamath Khaleel	Environment Analyst	Ministry of Environment and Energy	Government
Mr Mohamed Imad	Assistant Executive Director	Department of National Planning	Government
Mr Anil Adam	Deputy State Minister	MTAC	Government
Mr Hussain Zahir	Marine biologist	Coral Reef Monitoring	Government

Mr Abdulla Shibau	Manager	Baa Atoll Ecosystem Conservation Fund	Government
Mr Ibrahim Naeem	Director General	Environment Protection Agency	Government
Mr Muneesh Kapoor	Contracting & Finance Manager	Hulhulé Island Hotel	Hotels
Mr Utkarsh Faujdar	General Manager	Hulhulé Island Hotel	Hotels
Dr Hassan Saeed	Advisor to the President	President's Office	Legal Expert
Uz Husnu Al Sood	Attoney at Law	Sood and Anwar LLP	Legal Expert
Mr Ahmed Nizam	President	NGO Federation	NGO
Ms Aminath Haifa Naeem	Senior Project Coordinator	Transparency Maldives	NGO
Hon Mr Ahmed Hamza	Member of Parliament	People's Majlis	Parliament
Mr Roberto Sulas	Malé Office Manager	Alimatha Aquatic Resort, Maayafushi Tourist Resort, Dhiggiri Tourist Resort	Resorts
Mr Raul Estevez	Director of Learning & Development	One & Only Reethi Rah, Maldives	Resorts
Mr Mohamed Riza	Local Affairs & Team Welfare Manager	Kanuhura Island Resort	Resorts
Mr Moosa Sharn	Marine and CSR Coordinator	Banyan Tree Maldives Vabbinfaru	Resorts
Mr Thoha Rasheed	General Manager	Vilamendhoo	Resorts
Mr Saud Abdulla	Director of Government & General Affairs	Shangri-La Villingilli Resort & Spa	Resorts
Name withheld	Environment Manager	Foreign Resort Operator A	Resorts
Name withheld	Environment Manager	Foreign Resort Operator B	Resorts
Mr Ahmed Riyaz	Managing Director	Faunu Travels	Safari Operator

Mr Abdul Muhsin Moosa	Managing Director	Travel Land Maldives Pvt Ltd; Beach Investment Pvt Ltd	Safari Operator
Mr Mohamed Riyaz	Managing Director	Maldives Association for Yacht Agents [MAYA]	Tour Operators
Mr Mohamed Saeed	Consultant	Maldives Association for Yacht Agents [MAYA]	Tour Operators


gef
GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET
UNDP
Maldives
Griffith
UNIVERSITY