

**Does the Republic of Maldives  
have the capability to handle  
the growing tourism demand,  
whereas facing the difficulties  
of global warming?**

---

Bachelor Thesis for Obtaining the Degree

Bachelor of Business Administration

Tourism and Hospitality Management

Submitted to MTM Tina Roenhovde Tiller

<Miriam Auer>

<1011551>

<Vienna>, <15> <November> <2012>

## **Affidavit**

I hereby affirm that this Bachelor's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

The thesis was not submitted in the same or in a substantially similar version, not even partially, to another examination board and was not published elsewhere.

---

Date

---

Signature

## Abstract

In today's world, being sustainable is not just a trend but also essential for future generations. Once recognized, the consequences of global warming cannot be overseen and it is vital that society realizes and understands the problems that will occur. As we all know nature and all its resources were, are and always will be necessary for life itself. Should the world not understand the urgent need for change, then the problems of rising temperatures, swelling sea levels, the decrease in fresh water supplies, the devastation of land and the loss of marine biodiversity could not be solved in a motivated, calculated and accurate way. As the world's population continues to grow, the necessity of land and all of its resources and raw materials are becoming an ever-growing and inevitable concern. Perhaps the biggest consequence is the outcome of small islands and how the loss of land will affect those living on them. This paper studies the various impacts that pose significant risks to small islands, illustrated by the example of the Maldives. The country's economy is heavily dependent on its tourism activities and fisheries. However, there are many hidden consequences of tourism on the island, especially when it comes to ecotourism, as it relies on the fragile, unspoiled and undisturbed natural landscape. Hence, there is a disagreement, whether tourism is beneficial or harmful to the Maldives. The lack of robustness to resist human induced and natural environmental damages, which are caused by tourism development and climate change impacts, are one of the key challenges the archipelago is facing. Moreover, not only do these environmental damages cause destruction of the ecosystem, but also the construction of numerous tourism resorts on the islands and coastal structures are manipulating the main asset of the archipelago, which is the reef system (Karthikheyan, 2012, p.345). Therefore it is obvious that tourism is a double-edged sword, which needs to be well thought through and well planned. This study evaluates if the Maldives will have the possibilities to manage the increasing tourism in future while facing the threats of global warming. For this reason, an expert interview was conducted and literature extensively reviewed in order to gather factual information about the situation the Maldives is facing. Results revealed that there are various possibilities to support sustainable

tourism and make the destination more resistant to global warming, by differentiating between hard and soft measures. The findings add to the understanding of a very complex phenomenon, which may guide further research.

## Table of Contents

<b>Affidavit .....</b>	<b>2</b>
<b>Abstract.....</b>	<b>3</b>
<b>Table of Contents.....</b>	<b>5</b>
<b>List of Tables .....</b>	<b>7</b>
<b>List of Figures .....</b>	<b>7</b>
<b>List of Abbreviations .....</b>	<b>8</b>
<b>1 Introduction and Scope of the Study .....</b>	<b>9</b>
<b>1.1 Motivation for the Study.....</b>	<b>9</b>
<b>1.2 Problem Statement.....</b>	<b>9</b>
<b>1.3 The Aim of the Study.....</b>	<b>10</b>
<b>1.4 Structure of the Thesis.....</b>	<b>10</b>
<b>2 Literature review .....</b>	<b>12</b>
<b>2.1 Brief History of Maldives.....</b>	<b>12</b>
<b>2.2 Tourism in the Maldives.....</b>	<b>15</b>
2.2.1 Tourism.....	15
2.2.2 Analysis of the importance of tourism for the economy of the Republic of Maldives.....	16
2.2.3 Tourism facts and figures .....	17
<b>2.3 The Maldives and Climate Change .....</b>	<b>25</b>
2.3.1 Environmental challenges.....	25
2.3.2 Climate Change History and Facts .....	25
2.3.3 Global warming’s direct and indirect effects on tourism .....	30
2.3.4 Adaption to Climate Change .....	31
2.3.5 Island tourism impacts on the Environment, the Community and the Economy.....	35
<b>2.4 The role of the government facing growing tourism in the race          against the clock to prevent climate change .....</b>	<b>39</b>

2.4.1	Governmental situation.....	39
<b>2.5</b>	<b>Challenges and opportunities of the growing tourism sector for the Islands .....</b>	<b>43</b>
2.5.1	Opportunities of tourism in the Maldives.....	44
2.5.2	Challenges of tourism in the Maldives .....	44
<b>3</b>	<b>Methodology .....</b>	<b>48</b>
<b>4</b>	<b>Findings of the Study.....</b>	<b>49</b>
4.1	The changes and new options .....	49
4.2	Limitation of this Study and Further Research.....	55
<b>5</b>	<b>Conclusion .....</b>	<b>57</b>
<b>6</b>	<b>References .....</b>	<b>60</b>
	<b>Appendices .....</b>	<b>64</b>
	<b>Appendix 1.....</b>	<b>64</b>
	<b>In-Depth Interviews .....</b>	<b>64</b>

## List of Tables

Table 1: Tourist Arrivals to the Maldives between 2000-2011 (MOTAC, 2012, p.12).....	17
Table 2: The Accommodation Establishments and Bend Capacity, 2007-2011 (MOTAC, 2012, p.11) .....	18
Table 3: Bed Nights, Occupancy Rate and Duration of Stay, 2007 – 2011 (MOTAC 2012, p.94).....	19
Table 4: Monthly Average Occupancy Rates of Resorts & Hotels, 2007 - 2011(MOTAC, 2012, p.5) .....	21
Table 5: Monthly Arrivals tot he Maldives, 2007- 2011 (MOTAC, 2012, p.17).....	22
Table 6: International Tourist Arrivals Worldwide (MOTAC 2012, p.6).....	22
Table 7: Maldives Tourism Forecasts (MOTAC, 2012, p.26).....	24
Table 8: Hard & Soft Measures (Sovacool, 2011) .....	50

## List of Figures

Figure 1: Map of the Maldives (Domrös, 2012).....	13
Figure 2: Phases of Tourism Development (Domrös, 2012) .....	13
Figure 3: Average Duration of Stay 2007 – 2011 (MOTAC, 2012, p.5).....	19
Figure 4: Klimakonferenz 2050 (Domrös,2002) .....	30
Figure 5: Direct and Indirect Consequences of climate change for tourism (Becken & Hay, 2007, p.48).....	31
Figure 6: Triple Bottom Line (Insight Associates, 2010) .....	34

Figure 7: Comparison of Expatriate and Local Employment by Industry in March 2006 (Shakeela, 2007) .....45

## **List of Abbreviations**

3BL	Triple Bottom Line
GEF	Global Environment Facility
MATI	Maldives Association of Tourism Industry
MOTAC	Ministry of Tourism, Arts and Culture MOTAC
NDP	National Development Planning
NEAP	National Environment Action Plan
SIDP	Safer Island Development Program
UNDP	United Nations Development Program
UNWTO	United Nations World Tourism Organization

# **1 Introduction and Scope of the Study**

## **1.1 Motivation for the Study**

Climate change is threatening more and more regions of the world. The Maldives is among the 10 most vulnerable and endangered areas worldwide, threatened by global warming and its effects. Climate change could ruin the great reputation of the island amongst tourists, as 80% of the islands are not more than 1,5 meters above sea level on average.

With the current ocean-rising dynamics, as polar ice is melting and sea level is rising, experts fear, that the Maldives could disappear before the year 2050. Also cyclones are a consequence of global warming. All these calamities of nature can have devastating consequences for the Maldives, as the country mainly lives from tourism. The archipelago is a country, which is dramatically reliant on its natural resources. The Republic of the Maldives is aware of its dependence, but precisely the isolation, vulnerability and the fragile ecosystem represent the main assets and attraction of the country.

## **1.2 Problem Statement**

The great issue therefore is: 'What possibilities does the Republic of the Maldives have facing their current situation?' Should the archipelago capitulate and wait for submerging, or should it fight and find alternative solutions. Will tourism be possible in this complicated situation? Tourism is the country's major source of income, which the nation cannot afford to cast aside. However, tourism appears to be very harmful to the environment. Therefore it is crucial, that the government adjusts tourism, by incorporating practices to reduce negative effects on the environment. The main issue in achieving sustainable tourism development under the given circumstances is to understand that to achieve beneficial outcomes, three factors need to be monitored and carefully treated: the economic environment, the social environment and the natural environment with the support of the government.

### **1.3 The Aim of the Study**

The study is designed to serve two aims.

First, the goal of this study is to evaluate the degree of importance of tourism to the archipelago and to assess the situation of the Maldives, when facing the consequences of global warming. In other words, the first goal is to evaluate how and if the Maldives can cope with the increasing demand of tourism when facing their serious issues with the climate change. Moreover it evaluates the question as to why the archipelago continues to pursue tourism when facing the associated consequences.

In exploring answers to this question, this research will secondly focus on finding successful and sustainable solutions, to continue tourism development while maintaining the natural and social environment for the Maldives. Furthermore, alternative options will be considered, in case the Maldives will actually disappear. Past and future projects to respond to this drastic eventuality will also be discussed in this paper.

### **1.4 Structure of the Thesis**

The study is conducted by focusing on past researches about the impacts of climate change on the Maldives. Moreover, the aim is to detect, the degree of the importance of tourism to the archipelago and to find solutions to extend the wellbeing of the country, as long as possible.

Chapter one explains the motivation for the study, the problems and aims of the study as well as the structure of the thesis. The following chapter reports and describes a body of research, which explores the historical background of the Republic of the Maldives and the history and facts of tourism in the archipelago. Experts of the field recognized that action needed to be taken against global warming. Worldwide, the tourism sector will need to adjust to global warming by integrating practices to reduce negative effects on the natural and social environment, which will be investigated throughout the thesis. Moreover, the chapter presents the role of the government, including its recent efforts and future projects to survive. Chapter 3 is the Methodology Chapter, which describes and presents the methodology deployed in this study. Chapter 4 is a

mere exposition of approaches found, which are relevant to the research question, which outlines the challenges and opportunities of tourism to the Maldives and gives possible solutions to handle the growing demand. Last but not least an overall conclusion will discuss the entire research thesis objectives and results.

## **2 Literature review**

This chapter will explore the literature, which is necessary to understand the topic. The first chapter of the review of the literature will cover the history of the Maldives, followed by a research on tourism and its importance to the archipelago. Moreover, global warming in general and how climate change has an impact on the Maldives tourism industry will be discussed. However, there is a big conflict, as ecotourism cannot exist without the environment, and the environment cannot ignore the vigorous effects the industry is having on it. The observation of social, environmental and economic criteria is therefore essential to strike a balance. Last but not least, global warming continues to be a main issue of political debate; therefore the situation and the role of the Maldivian government will be analyzed.

### **2.1 Brief History of Maldives**

After the short introduction and the problem statement, this chapter deals with the brief history of the Maldives.

The Maldives are naturally shaped as 26 atolls and are part of the Laccadives-Chagos Ridge, which spans more than 2.000 kilometers (Karthikheyana, 2012, p.344; Shakeela, 2007).

The upscale tourist destination is roughly situated 450 miles southeast of Sri Lanka across the equator in the Indian Ocean. The Republic of Maldives encompasses 26 major atolls and 1.190 small distributed cays distributed on an economic zone of 859.000 square kilometers whereof 99% of the territory are covered by the ocean (Gagain, 2012; Karthikheyana, 2012, p.344; Shakeela, 2007; Zulfa & Carlsen, 2011, p.218). The islands are low lying, with an average elevation of 1,6 meters above sea level, maximum height above sea level is around 3m, and the largest island stretches over 2,5 square kilometers surrounded by coral- and/or sandbanks (Gagain, 2012; Karthikheyana, 2012, p.344; Shakeela, 2007; Zulfa & Carlsen, 2011, p.218).

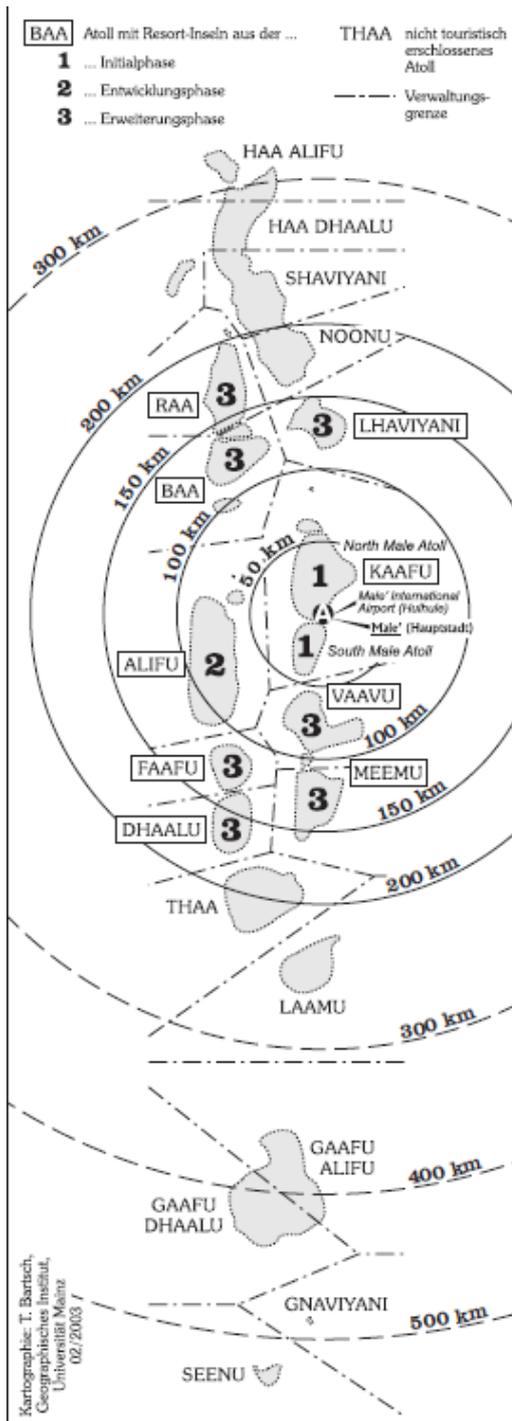


Figure 1: Phases of Tourism Development (Domrös, 2012)

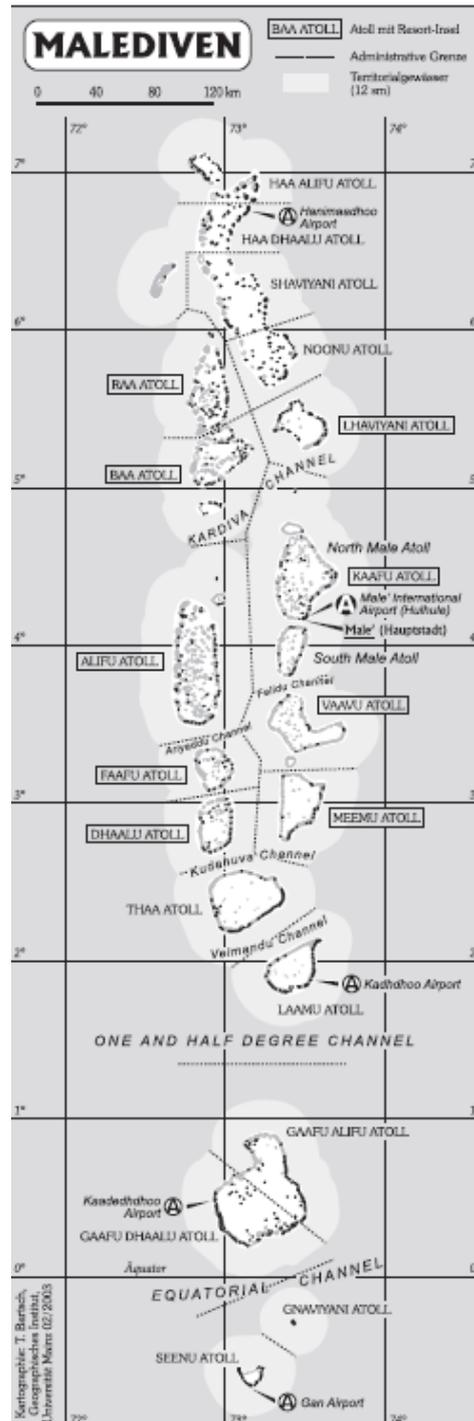


Figure 2: Map of the Maldives (Domrös, 2012)

Merely 33 inhabited islands possess a land area more than 1 km<sup>2</sup>. The main reason, why travelers spend their holidays in the republic, are the natural assets, such as the tropical island environment and the multifariousness of the reef ecosystem, which is counted among the varied reefs in the world (Majeed,

2006). The reefs, covering a territory of more than 8,920 square km, belong to the ten biggest worldwide, counting over 5% of the total world reef area (Majeed, 2006). Furthermore, the Maldives comprises beautiful atolls, occupied by over 1,100 varieties of fish and other wild life, attracting over 900.000 visitors every year.

The Maldives, a 100% Muslim nation, recently adopted a newly developed constitution (World Bank 2012 cited from Zeenaz et al., 2012, p.72). The small coralline islands belong to the government, whereof 194 of the Maldives islands are settled and 88 islands are so called individual self-contained resorts on a 'one-island-one-resort' concept. This is unique to the archipelago, as 122 cays are rented for the purpose of farming and trade, 35 islands are used for tourism enlarge purpose and the residual cays are untenanted islands (Shakeela, 2007). The individual islands are mainly rented out for a duration of 25-35 years, whereby the lessee is remitting an annual rent to the government, for the use of industrial, tourism progress or farming (Shakeela, 2007). In 2011 a modification was made, which allowed resort operators to design sub-contracts, for management purpose, under a management agreement (MOTAC, 2012, p.11). There are no land based building materials and only 10 percent of the islands are applicative for farming and agriculture. The Maldives does not consist of any mountains and rivers (Karthikheyan, 2012, p.344). Moreover, perhaps 2,600 hectares are tilled with fruits such as coconuts and taros. Only the opulent island of Fua Mulaka flourishes fruits such as pineapples and oranges, as the grounds are higher than on the other cays, which provides groundwater less affected by sea water penetration (Karthikheyan, 2012, p.344).

The archipelago exerts a presidential-parliamentary democracy and has a population of less than 325,000, with about 100,000 residents living in Malé (Travel State Gov, 2012). The island of Malé, the capital city of the Maldives, covers fewer than 2km<sup>2</sup> with an maximum elevation of only 2,4 meters (Zeenaz et al., 2012, p.72). The overcrowding is the primary reason of many ecological problems there. About a quarter of the Maldivian population is living on the island (Zeenaz et al., 2012, p.72).

Infrastructure and resources, as well as pollution, urbanization, changes in technology and the increasing consumption, represent major challenges in the

country. According to Shaljan (2004), sparsely designed waste and sewage disposal systems, poorly planned land use, have had serious environmental, economic and social consequences for Malé (Karthikheyan, 2012, p.344). Moreover, only an ordinary rise in ocean heights would overrun a majority of its territory. In order to control the menace, the government built a seawall around the entire island (Sovacool, 2011, p.744).

The Republic of the Maldives belongs to the most violative and least defensible countries worldwide, by reasons of its low elevation and vulnerable ecosystem, isolation, geographical distribution, the low human resource foundation, a great limited internal market and a dramatically competitive external market (Majeed , 2006). The overall situation for the flattest country on earth is complex, as its main income generator, tourism, is reliant on its unique marketable assets and as the archipelago does not have any other commercially exploitable resources to generate revenue from (Majeed, 2006).

## **2.2 Tourism in the Maldives**

The motivation for this study is to evaluate an answer to the question, if the Republic of Maldives has the capability to handle the growing tourism demand, whilst facing the difficulties of global warming. Working out the importance of tourism to the Maldives, will be the first step to find the answer to the question.

### **2.2.1 Tourism**

One of the fastest growing sectors of the economy is the hospitality leisure and tourism industry, which also has become the principal operation and resource of economic wealth. People travel because of different reasons, such as: travel for visiting friends and relatives, pleasure, entertainment, business, recreation education etc. Destinations compete to satisfy those different needs by emphasizing the experience they have to offer to finally attract those customers to their distinctive travel destination (Ritchie & Crouch, 2003, p19).

Tourism can be beneficial to a destination, in terms of employment, gross outputs and the input tourism generates to the world economy. However, it also exerts impacts that are not favorable at all, such as the require it makes on the global resources, directly or indirectly (Cater & Lowman, 1994, p.89). In order to

minimize these negative events, the rate of growth of tourism infrastructure needs to be controlled and the associated development must be carried out on a sustainable basis (Zulfa & Carlsen, 2011, p.216).

### **2.2.2 Analysis of the importance of tourism for the economy of the Republic of Maldives**

Sun, exceptional and unspoiled white sand beaches, blue lagoons and colorful coral reefs. These idyllic images pop up in one's mind immediately, when thinking about islands tourism.

Tourism in the Maldives was first established by an Italian tourist operator named George Corbin, who was supported by three adventurous Maldivians, Hussain Afeef, Ahmed Naseem and Mohamed Umar Maniku (Zulfa & Carlsen, 2011, p.216). Today, out of those three entrepreneurs, two own the two largest tourism organizations in the Maldives called Crown Company and Universal Enterprises (Zulfa & Carlsen, 2011, p.216). Moreover, in 1982 Mr. Maniku and Mr. Afeef established and participated in the Executive of the Maldives Association of Tourism Industry, abbreviated MATI. 'Under these two pioneers, the tourism industry in the Maldives has transformed itself to an exemplary status, demonstrating the innovative ability of Maldivians and the spirit of Maldivian enterprise' (Reimer cited from Zulfa & Carlsen, 2011, p.216).

Ever since tourism started in 1972, the industry has grown swiftly (Majeed, 2006). The first two resorts for the purpose of tourism were inaugurated in 1972 at Vihama (Shakeela, 2007; MOTAC, 2012, p.10).

Due to the decisive growth in infrastructure and the considerable amount of new building constructions, comprising mainly five star resorts, the archipelagos shifted expeditiously into a high-class deluxe tourism destination. In the early stages of tourism, government leased out only islands for the purpose of tourism, nearby the only international airport, located on the North Malé Atoll on Hulhulé Island, away from the local inhabited islands (Zulfa & Carlsen, 2011, p.217).

Later, under the Second Tourism Master Plan, the government released further atolls for the use of tourism. New principles were agreed on under the Third Master Plan, where tourist development was allowed to expand across the whole

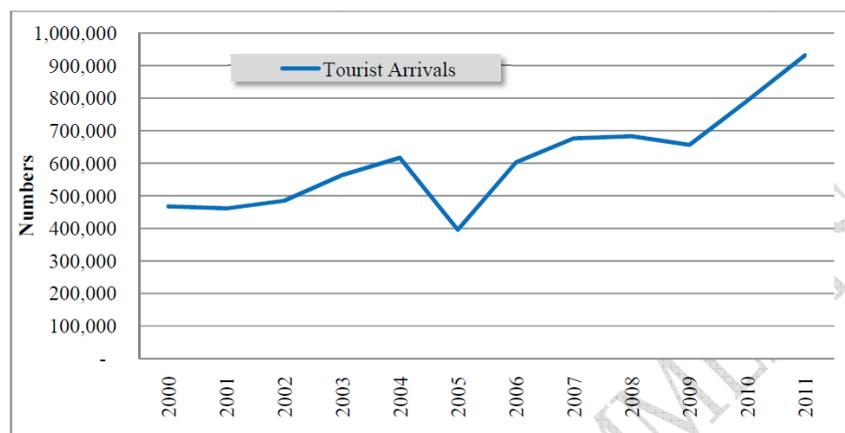
archipelago, implying new undertakings to build domestic airports to interlink all atolls (MOTAC, 2012, p.10). Seaplanes and helicopters are used to reach the atolls today, which is facilitating the journey to the different island resorts, which also had well supported the development of tourism in the archipelago, as islands far off have suddenly become within easy reach (Zulfa & Carlsen, 2011, p.217).

### 2.2.3 Tourism facts and figures

The Maldives has recorded a reduplicating in arrivals over the last 20 years (Carlsen, 2011). Only very few tourism destinations in Asia are capable to show such a climb in arrivals. Therefore it is clear that the Maldives had to rapidly adapt to those considerable changes under certain conditions, the Maldives are liable to.

The economy is dependent on mainly two industries, the fishery and tourism, including the 'countries fiscal revenues, foreign exchange earnings and employment and growth' (Majeed, 2006). Each of these sectors faces a high and cosmopolitan competition.

According to the Tourism Yearbook 2012, produced and published by the Statistics & Research Section of the Ministry of Tourism, Arts and Culture (MOTAC), the tourism arrivals have increased significantly during the last decade.



**Table 1: Tourist Arrivals to the Maldives between 2000-2011 (MOTAC, 2012, p.12)**

Table 1 illustrates the tourism arrivals between the years 2000 and 2011. Since the year 2000 there have been two clear decreases. The cause of the fall in 2005

was the Tsunami whereby in the year 2009 the effects of the economic crisis are visible (Motac, 2012).

In general, the Maldives provides 4 kinds of lodging establishments, which can be seen in table 2: tourist resorts, tourist hotels, tourist guesthouses and safari boats

Type of Establishment	2007		2008		2009		2010		2011	
	Nos	Beds								
Resorts / Marinas	92	19,028	94	19,860	97	20,942	98	21,342	101	22,120
Hotels	11	886	13	1,110	15	1,368	17	1,449	19	1,603
Guest Houses	24	400	24	400	22	462	25	476	38	659
Safari Vessels	133	1,923	143	2,094	145	2,206	156	2,434	157	2,514
<b>Total</b>	<b>260</b>	<b>22,237</b>	<b>274</b>	<b>23,464</b>	<b>279</b>	<b>24,978</b>	<b>296</b>	<b>25,701</b>	<b>315</b>	<b>26,896</b>

**Table 2: The Accommodation Establishments and Bend Capacity, 2007-2011 (MOTAC, 2012, p.11)**

At the beginning of the year 2012, 101 resort islands were counted during this period, with an 22,120 total bed capacity announced with the MOTAC (MOTAC ,2012, p.9).

82 percent of the total bed capacity percentage arrived from resort islands in 2011, followed by hotels with an overall bed capacity of 1.603. Budget accommodations, also called guest houses were initially found on the capital island Male, since beginning of 2011 this budget types have been constructed on local islands and have been becoming increasingly popular among tourists. Referring to MOTAC (2012) in the end of 2011, 659 beds were recorded accounting for a steadily increasing bed capacity of 2,5 percent.

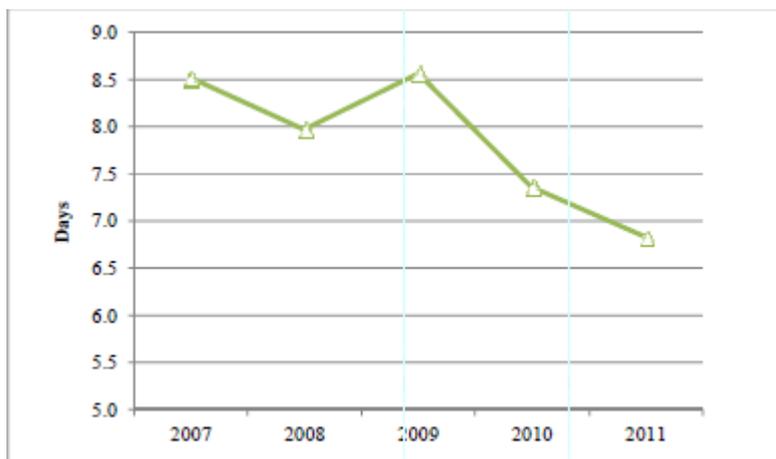
Floating beds were enjoying an increasing popularity shown in the year 2011 where there were more than 157 safari vessels, which led to the total bed capacity of 2.514 (MOTAC, 2012, p.11).

	Year	Bed Capacity in Operation (annual average)	Bed Night Capacity	Tourist Bed Nights	Bed Night Growth (%)	Occupancy Rate (%)	Average Duration of Stay (days)
	2007	17,589	6,400,167	5,293,224	9.7	82.5	8.5
	Resorts & Hotels	17,589	6,400,167	5,293,224	9.7	82.5	8.5
	Guest House and Vessels	-	-	-	-	-	-
	2008	19,117	6,996,640	5,446,937	2.9	77.8	8.0
	Resorts & Hotels	19,117	6,996,640	5,446,937	2.9	77.8	8.0
	Guest House and Vessels	-	-	-	-	-	-
	2009	20,137	7,338,221	5,150,688	-5.4	70.2	8.6
	Resorts & Hotels	20,137	7,338,221	5,150,688	-5.4	70.2	8.6
	Guest House and Vessels	-	-	-	-	-	-
	2010	23,649	8,631,809	5,986,342	-	69.5	7.6
	Resorts & Hotels	21,541	7,861,955	5,829,589	13.2	74.2	7.4
	Guest House and Vessels	2,108	769,854	156,753	-	20.7	0.2
	2011	24,490	8,938,190	6,529,141	9.1	73.1	7.0
	Resorts & Hotels	22,504	8,213,871	6,358,519	9.1	77.5	6.8
	Guest House and Vessels	1,987	724,319	170,622	8.8	23.4	0.2

**Table 3: Bed Nights, Occupancy Rate and Duration of Stay, 2007 – 2011 (MOTAC 2012, p.94)**

Table 3 shows the bed night capacity, tourist bed nights, occupancy rate and average duration of stay, between the periods of 2007-2011. In 2011, the bed night capacity increased by 3,5% compared to the previous year. The capacitance, conducted from operational bed capacity, have gone up continuously and along with the actual tourist bed nights (MOTAC, 2012, p.11).

Due to the impact of the economic crisis in 2008 you can see the downward trend in 2009 in the table. It also shows the overall bed night capacity of 8,938,190, which resulted in an overall bed night growth of 9,1 % between the years 2010 and 2011.



**Figure 1: Average Duration of Stay 2007 – 2011 (MOTAC, 2012, p.5)**

Figure 3 demonstrates that the duration of the stay declined between the years 2009 and 2011. According to MOTAC (2012) this might have been caused by the 'shift of demographic profile of major generating markets from Western Europe to North East Asia, where especially China was reflecting the diminution, which overtook all European markets and became the market leader.' Referring to the Maldives Visitor Survey 2011 (cited from MOTAC, 2012, p.12), 'more than 96% of the Chinese tourists stayed in the Maldives for less than 7 nights out of which 9% stayed for less than 3 nights'.

The average spending of a tourist, who is visiting the Maldives, accounts per person per day for approximately 90€ (Sandee, 2011). This number will remain constant, but the length of stay will trend downwards due to a shift to short-haul trips from Asian, especially Chinese visitors. Therefore the Maldives should think about revenue management, to sell the right product, to the right people at the right price and time. Seasonality is also a major challenge for the Maldives. Furthermore, it is important to consider, that most of the resort islands pursue a cash free system, which is obtained by all-inclusive packages or by allowing customers to deposit their invoices on their room accounts, to guarantee their visitors to fully enjoy their dream holidays. Therefore, the country could utilize the demand for short-term stays and combine it with all-inclusive packages in low seasons to increase their overall revenue.

Table 4 illustrates the monthly average occupancy Rates of the Resorts and Hotels by months.

Month	2007	2008	2009	2010	2011
January	94.8	90.0	86.5	83.5	87.2
February	100.1	95.9	85.9	92.5	94.4
March	94.3	95.7	81.6	82.6	85.8
April	92.6	88.2	75.2	74.2	83.8
May	70.4	70.4	59.1	64.5	65.5
June	58.9	54.2	47.5	50.2	55.0
July	72.0	65.3	56.7	63.5	68.9
August	84.4	76.0	66.0	73.1	72.8
September	73.6	66.0	62.7	67.6	69.3
October	81.2	75.7	73.0	79.8	83.4
November	85.7	78.1	74.6	81.4	83.9
December	85.1	78.4	73.8	77.7	79.9
<b>Annual Average</b>	<b>82.8</b>	<b>77.8</b>	<b>70.2</b>	<b>74.2</b>	<b>77.5</b>

Table 4: Monthly Average Occupancy Rates of Resorts & Hotels, 2007 - 2011(MOTAC, 2012, p.5)

This table enables you to detect the high and low seasons of the Maldives. Based on the table above, it can be seen, that October to April were investigated to be the main season, while a low occupancy rate can be evaluated during the months of May until September, whereby June yields by far the lowest and February the highest rate. This is due to several reasons, first the weather and diving conditions are very good during the seasons between October to April and second many international holidays coincide during this season, such as Christmas, New Years, Chinese New Year and Easter Break Holidays (MOTAC, 2012, p.13).

The following table displays the monthly arrivals to the Maldives, 2007-2011.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2007	64,570	65,224	64,491	63,171	46,602	38,457	51,025	53,168	48,468	58,706	56,797	65,210	675,889
2008	64,621	67,963	71,623	62,670	48,764	40,283	47,675	51,824	50,687	56,363	57,961	62,578	683,011
2009	61,531	58,520	62,127	57,186	43,154	36,205	44,332	52,388	50,396	62,432	61,986	65,595	655,852
2010	67,478	77,063	74,975	60,742	58,324	44,050	57,232	66,315	62,524	74,707	74,252	74,255	791,917
2011	79,493	87,392	80,732	79,947	64,456	55,947	72,516	76,828	71,861	91,059	85,501	85,601	931,333

**Table 5: Monthly Arrivals to the Maldives, 2007- 2011 (MOTAC, 2012, p.17)**

Between the years 2007 and 2011 tourist arrivals augmented by the average number of 9,5% (MOTAC, 2012, p.15). Referring to MOTAC (2012) the significant decrease between the years 2008 and 2009 is because of the global economic crises. In 2011 the Maldives reached a new record when more than 900.000 total arrivals were recorded. Referring to Zulfa and Carlsen (2011) the United Nations World Tourism Organization (UNWTO) forecasts 1,414,000 tourists that will be visiting the Maldives in 2020. Looking at the rise in the previous years it is very likely that this estimate will be achieved. As the infrastructure and the plants and installments are supplied individually for each insular, each of it is an capital expenditure worth of about €10-15 million (Zulfa & Carlsen, 2011, p.218).

Since the building of luxury resorts in the Maldives, over the last 40 years, the major market consists of customers coming from Europe, Asia and America.

	Tourist Arrivals (in millions)				% Change (2011/2010)	% Share 2011 *
	2009	2010	2011 *			
Europe	461.1	474.6	502.3	5.8	51.2	
Asia & the Pacific	181.0	204.5	217.1	6.1	22.1	
Americas	140.7	149.7	156.0	4.2	15.9	
Africa	46.0	49.9	50.0	0.2	5.1	
Middle East	52.1	59.9	54.8	-8.4	5.6	
<b>World</b>	<b>881</b>	<b>939</b>	<b>980</b>	<b>4.4</b>	<b>100.0</b>	

Note: \*Data as collected by UNWTO, March 2012  
Source: Adapted from: UNWTO World Tourism Barometer, March 2012 Edition

**Table 6: International Tourist Arrivals Worldwide (MOTAC 2012, p.6)**

In accordance with MOTAC (2012), the most important market for the Maldives is Europe, where Russia, Switzerland, Germany, Italy, France and United

Kingdom, represent the leading markets, generating a total of 57% of the market share. From 1.097 Tourists in 1972, Europe accounts for more than 537.757 tourists in 2011 (MOTAC, 2012, p.16; Zeenaz et al., 2012, p.72). The second largest market is Asia and the Pacific, constituting for 348.887 tourists and holds 37% of the total market share, where China contributes most. In Correspondence with MOTAC (2012) America, Middle East and Africa region share the remaining 6% of the market share, whereby the America and Middle East proportion were continuously rising throughout the last years.

As in many small-island countries, the local economy is very dependent on tourism. Income from tourism makes up a large proportion of their gross domestic product.

The Maldives is no exemption, as in 2012, tourism, the cays largest economic activity, accounted for 28% of GDP and about 60% of receipts in foreign currency (MOTAC, 2012, p.16). Tourism revenue is generated from lease rent payable, bed taxes of 8\$ and Tourism Goods and Service Taxes of 6% (T-GST) (MOTAC, 2012, p.29).

More than 90% of government tax revenues come from tourism-associated taxes and import duties. The second largest economic operation is the fishery, which significantly decreased within the last few years. Manufacturing and agriculture only represent a small proportion of the GDP due to limited territory and human resources (CIA World Factbook, 2012). According to 'the WTO's Tourism 2020 Vision which forecasts, that the number of international arrivals worldwide will increase to almost 1.6 billion and receipts from tourism (excluding transport) are projected to reach US\$2 trillion by 2020' (WTO, 2001 cited from Shakeela, 2007).

	Real		Projections		2015
	2011	2012 (end Sep)	2013	2014	
Tourist Arrivals (000's)	931	692	1,057	1,144	1,237
% Growth	17.6	3.4	8.5	8.1	8.2
Average Stay (days)	7.0	6.8	6.8	6.5	6.2
Tourist Bed nights (000's)	6,359	4,728	7,167	7,470	7,707
Bed night capacity (000's)	8,214	7,107	9,093	9,716	9,942
Occupancy rate (%)	77.5	69.7	84.2	81.9	82.4
No. of Resorts / Hotels	112	124	134	141	141
Bed Capacity (end year total , resorts/hotels)	23,306	24,380	24,995	26,700	27,322

**Table 7: Maldives Tourism Forecasts (MOTAC, 2012, p.26)**

The table above shows the Maldives Tourism forecasts for the years 2013, 2014 and 2015. According to MOTAC (2012) with the increasingly accretion of the Chinese market the average of stay is expected to constantly drop. The bed night capacity and tourist bed nights are expected to rise constantly with an overall bed capacity of 27.322 at the end of the year 2015.

### **2.2.3.1 Conclusion**

This continuous increasing directs the Maldives to believe, that the tourism industry has the capability for a constant expansion in GDP share, in the long range (MOTAC, 2012, p.29). Tourism is the largest economic industry in the Maldives. Without these revenues, the Maldives would not be able to maintain the existing standard of living. Therefore the Maldives needs to continually pursue tourism while finding ways to reduce negative impacts associated with the industry.

## **2.3 The Maldives and Climate Change**

### **2.3.1 Environmental challenges**

After evaluating the importance of tourism to the Maldives, the questions remains, how climate change influences the Maldives. Furthermore it will be evaluated how the Maldives can reduce their impact on the environment.

It is not easy to fulfill the clichés of a tropical idyllic island, when coping with environmental and social problems, as the archipelago does. These islands have and had experienced significant changes through natural and human error and still struggle with coping with those impacts. Islands are subject to a range of environmental, social and economic forces internally and externally, including positive change but also negative effects (Carlsen, 2011). Referring to Carlsen (2011) in this light, it is understandable that islands are struggling to attain a balance between the economic growth, social solidarity and environmental maintenance.

Especially developing countries, where tourism represents the most important source of revenue, are threatened by climate change and its influences which exerts serious pressure on the industry (Majeed, 2006). Because of global warming the archipelago is facing serious environmental challenges. Moreover, natural decomposition, due to the increasing development in tourism is a further provocation. The Maldives is highly violative to nature's course of action, resulting in facing the danger of being entirely deluged in the next decades.

Referring to Karthikheyam (2012), there are mainly three aspects that provoke environmental challenges to the Maldives: Firstly, the way of tourism and its effects on the environment, secondly the climate change and its repercussions such as sea level rise, and finally the natural impacts such as Tsunami that might also occur due to global warming.

### **2.3.2 Climate Change History and Facts**

Many natural scientists are firmly convinced that climate change is happening.

Climatic change will and already does influence the trade of tourism, due to consequences on sea and terrestrial biodiversity and as a result on the basis of

existence of the native human population, dependent on these capabilities (Majeed, 2006).

The characteristics of the unique area, which are central to the Maldives tourism potential, are seriously threatened. These resulting problems did not occur completely by now, but the possibility that these threats are happening are real and can only be fully dealt with by international action (Gagain, 2012). Today, there is increasing scientific proof, that human influence has started to shift the average temperature of the earth's surface drastically (Karthikheyana, 2012, p.346).

Based on Karthikheyana (2012) research, to cope with this difficult situation, the world has far less time to start to reduce total greenhouse gas emission than previous anticipated. Carbon dioxide (CO<sub>2</sub>), which is measured in parts per million (ppm), is conglomerating expeditiously, which affects the exacerbations of global warming dramatically. According to IPCC 2007 (cited from Karthikheyana, 2012, p.346) the new temperature change impede grounds, oceans and woods to absorb CO<sub>2</sub> which complicate the effort to combat global warming. Sea level rise is probably the main anxiety small islands have to face.

The first international congress, where global warming was detected as a global danger, was the Climate Change Convention, where they discussed different actions of each signatory (Cater & Lowman, 1994, p.87). 'Both developed and developing countries will undertake real measures to take the threat we jointly face. The link between success in tackling climate change and the tourism industry is clear' (Cater & Lowman, 1994, p.87).

The Maldivian archipelago evince attributes, which makes the islands extreme violative to the effects of external impacts. Such actions, caused by nature or human are beach erosion, coral bleaching, coral mining, biodiversity loss, dredging, fresh water availability, soil degradation, population growth intense weather patterns and reduced resilience of coastal ecosystems and tsunamis, just to mention a few (Gagain, 2012; Karthikheyana, 2012, p.350). The tsunami in 2004 and its impacts made its vulnerability obvious, which caused severe damage to the Maldives economy and environment (Karthikheyana, 2012, p.343).

A further, if not the most frightful effect of climate change to the archipelago, is without a doubt ill effects of sea level rise (Majeed, 2006, p.5).

According to latest studies, which consider Greenland and Antarctic ice melt, demonstrate, that sea level will rise by 1m in 2100 (Donoghue, cited from Maschinski et al., 2011, p.148). According to Gagain (2012), 'For the Maldives, a 0.49 meter rise in sea level would mean that significant portions of the archipelagic state would be severely inundated by 2100. Moreover, at such a rate of sea level rise, fifteen percent of the Maldives' capital island of Malé would be submerged by 2025, with fifty percent submerged by 2100' (Gagain, 2012, p.84). Especially low elevation islands, located in the tropical oceans, become very vulnerable to sea level rise, as they demonstrate an average elevation of only 1, 5 meters. The rise of the sea levels, can have devastating effects at the local and tourism level, as over 70% of these islands have constructions with less than 30m from the coastline (Majeed, 2006, p.5). More than 50% of the total inhabited islands and over 45% of resort islands experience the effects of climate change, as beach erosion, induced by climate change, and its disastrous consequences can be seen already today (Majeed, 2006, p.5).

Karthikheyan refers to the significant findings of the IPCC Fourth Assessment Report (2007), which also includes the main impacts on the Maldives:

### **1. Climate Change**

The IPCC (cited from Karthikheyan, 2012, p.346) reveals, 'Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations. Warming of the climate system has been detected in changes of surface and atmospheric temperatures in the upper several hundred meters of the ocean, and in contributions to sea level rise.' As mentioned above, the Maldives are severely jeopardized since the mean height of the islands is only one meter above the sea level, which radically threaten the Maldives from surviving (Karthikheyan, 2012, p.346).

### **2. Fresh Water supply**

Also the negative effect on fresh water supply due to the decrease in precipitation in the lower latitudes is a challenge, the archipelago will and already has to deal with.

Moreover, the continuous infusion of salt water on the disposable fresh water supplies will also affect the stockpile of fresh water. Most of the islands live on rain water as their only source of freshwater, however, there are some islands which dispose of ground water which is not subject to sea water intrusion (Karthikheyan, 2012, p.344). Today the islands mostly draw on bottled water and increasingly use water desalination plants to produce drinking water, as ground water levels continually fall (Zulfa & Carlsen, 2011, p.220).

### **3. Marine biodiversity**

The Maldives holds some of the greatest coral reefs of the world, which are highly jeopardized today. Due to changes in extreme weather and climate events, most land areas will suffer from warmer and lesser cold nights and days inducing to warmer and more prevalently hot nights and days which leads to consequences to the Maldives marine biodiversity (Church et al., 2006, p.155). Potential damage to coral reefs and therefore also to fisheries is likely to happen because of global warming. The reduced resistance of coastal ecosystems, which became evident during the coral bleaching in 1998 during the El Niño-event, destroyed most of the country's shallow reef coral, poses a serious problem (Church et al., 2006, p.155). Coral reefs have the capability to grow with the rising sea level and would probably be the cheapest solution to safe the archipelago. However, because of the rise in water temperature, corals are strained which leads towards the corals remitting the algae which is necessary to receive nutrients. Even if the water temperature only increases a little, the algae abandon the coral polyp, which make the coral loose its colors and which might lead to death (Robinson, 2010). It is probable, that large zones of biosphere may be vanishing completely in the next century (Maschinski et al., 2011, p.147).

#### 4. Natural catastrophe

The IPCC report (2007) also includes the notice of an increase in intense tropical cyclone activities, which can also harm the violative coastal system. The rising temperature of the ocean surface could imply variation in weather conditions, including intensive and frequent extreme events, such as storms, floods hurricanes and cyclones (Maschinski et al., 2011, p.148).

A further endangerment are Tsunamis, which exposed its serious and devastating effects in 12 countries in 2004, when a giant wave, caused by an earthquake measuring 8,9 on the Richter scale, struck the Maldives on the 26th of December in 2004 (Karthikheyan, 2012, p.348). Afterwards there was a significant exchange in weather and sea level. 'Ironically, the Maldives are so flat and small and low that the tsunami just passed over the island from one side through the other side' (Karthikheyan, 2012, p.348). Because of the lack of a big landmass, the Maldives suffered less than Indonesia's Aceh and Sri Lanka who have been at the mercy of the heavy ravaging effects. That does not mean that the archipelago has been spared completely, in the matter of fact, in regards to environmental degradation and biodiversity loss the Maldives has been the country most severely hit (Karthikheyan, 2012, p.348). According to Karthikheyan 2012, the effects almost eliminated the protected areas' infrastructure and management systems. Not only did the disastrous wave crush the coral reef to a large extent, but also the inundation of silt, slime and sludge on the corals suffered from dreadful consequences. The impact of the giant wave was massive on the economically as well as on the ecologically side. Over 15.000 out of the 300.000 human population became homeless, and a decline was not only recorded in the marine diversity but also decreasing numbers in tourism and fishing were the radical effects of the natural disaster (Karthikheyan, 2012, p.348).



Figure 2: Klimakonferenz 2050 (Domrös,2002)

Global warming impacts demonstrate hideous menaces for not only the natural but also for the human communities located on these cays. Articulatedly, changes will not only affect the environmental conditions of the Maldives but also impact the tourism sector survival.

### 2.3.3 Global warming's direct and indirect effects on tourism

The tourism industry of the Maldives has serious problems and challenges to face, due to global warming and the consequential climate change.

As illustrated in the previous chapter, climate change has a considerable impact on the tourism economies of small island countries. Beach erosion, rising sea level, decreasing reserves of drinking water and the destruction of marine life, are only some of many possible threats that burden the archipelago and therefore might minimize the stimulating factors to travel to the destination.

Figure 5, cited from Becken and Hay (2007) shows the direct and indirect effects of global warming for tourism and adaptation measures. The figure shows, that coral bleaching, as explained in the prior chapter, is an indirect consequence of the elevated sea temperature, which could lead to a decline in arrivals due to the loss of one of the main assets of the Maldives, the marine biodiversity. The El

Niño-event in 1998 destroyed most of the shallow reef coral which negatively affected the country's economy (Becken & Hay, 2007, p.49).

Moreover coastal erosion is also a critical issue the archipelago is confronted with. Presumably 50% of all inhabited islands and more than 45% of resort islands are effected by beach erosion, which could lead to serious problems, concerning the building constructions which are mostly built within 15m of the shoreline(Becken & Hay, 2007, p.49).

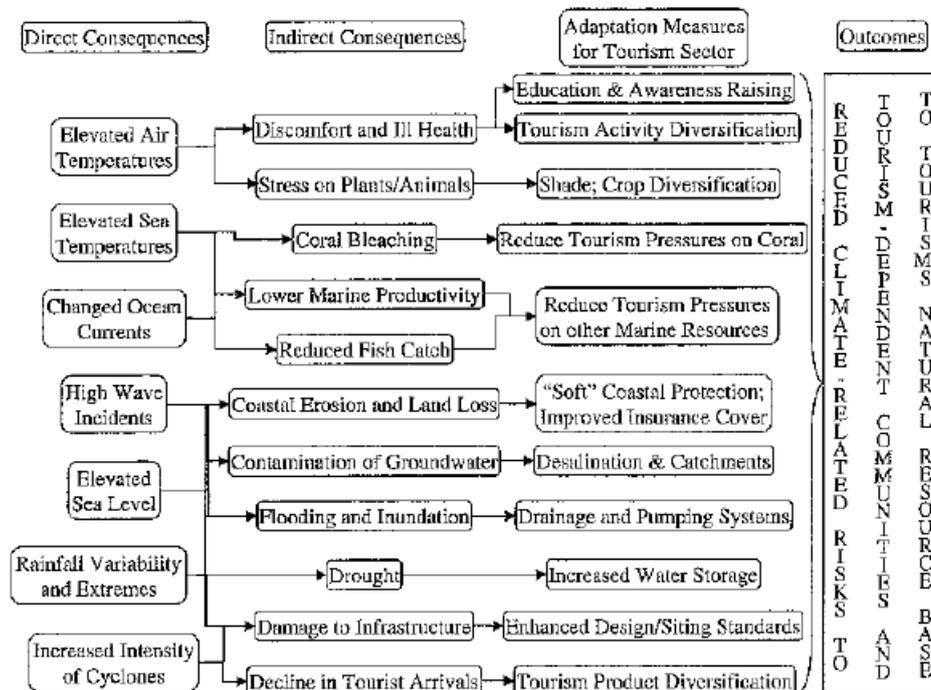


Figure 3: Direct and Indirect Consequences of climate change for tourism (Becken & Hay, 2007, p.48)

It is important, that these impacts are comprehended and that efforts are made to reduce the effects caused by global warming.

### 2.3.4 Adaption to Climate Change

Tourism is a booming industry, which has now become obvious, as accordingly to Matthews (2012), 1 billion people travelled outside their national borders in 2012. With all those tourists flocking around the world, it is a given, that these activities cannot escape without taking harm; however behaving sustainable can definitely reduce the damage. This chapter reviews the meaning of ecotourism

and sustainability and the importance to follow the so-called 'triple bottom approach'.

#### *2.3.4.1 Ecotourism and Sustainability*

Economic, social and environmental issues need to be taken into consideration in order to ensure successful ecotourism operations, which are all basic observations to pursue sustainability.

Whelan (1991, cited from Dowling & Page, 2001, p.12) defines ecotourism as a type of tourism, that is reliant on nature and environmental resources, as these coefficients are the main motivators for tourists to visit a destination. 'The key attractive resources of that form of alternative tourism, known as ecotourism are natural or semi-natural systems and so sustainable ecotourism must be based upon the principles of ecosystem structures and functions' (Cater and Lowman, 1994, p.5). An equally important contribution to understand ecotourism is that the ultimate protectors must be the local human communities (Cater and Lowman, 1994, p.5). Destinations, which pursue ecotourism, must be aware, that they need to have an intact and well-preserved product to sell. Hence, ecotourism requires to be sustainable and resources needs to be managed effectively, which is a challenge, facing the ecological formation of the Maldives and the shortage of trained personnel (Karthikheyan, 2012, p.345).

In order to be able to introduce sustainability to the island tourism an understanding of sustainability itself is necessary. The best known definition for sustainable development is derived from the World Commission on Environment and Development, which is defined as follows 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs' (Cater & Lowman, 1994, p.5).

According to Carlsen (2011), sustainability is a holistic concept, meaning that a holistic approach and adoption is demanded to understand the problem at hand. However, sustainability is not something that happens overnight, as Carlsen (2011) refers to it as an intergenerational process, which takes several generations to adapt to the process of economic, social and ecological transformation. Increasing constructions of tourism and recreational facilities, but also tourist activities and infrastructures have huge environmental impacts

on the flora and fauna of many tourism islands. Repatriation of the flora and fauna is taking a long time, if at all; to recover to island habitat as it existed in the past. And as if this was not enough, the characteristics of islands, such as social insularity, economic dependency and ecological fragility are making this process especially difficult (Carlsen, 2011). Therefore, to achieve sustainability and to introduce it to such destinations, there is a need of informing and changing both, tourists and inhabitants.

Hence, to change the view and consciousness of inhabitants, the key is apprenticeship and to demonstrate the potential increasing economic and social benefits from conservation of their natural assets, which, as already mentioned, ecotourism is based on (Cater & Lowman, 1994, p.35). Such a contribution of the local communities, should act as the foundation of ecotourism, which can mainly be obtained by ready and enthusiastic residents, by developing new capabilities and human resources, and to make them play an important part but also to become responsible in the process of controlling the tourism projects. Therefore it is important to accomplish the preservation of the national environment and the well-being and basic needs of the locals, which will directly lead to satisfying the needs and wants of the high demanding tourists.

If this is exercised well, resource preservation and growth of tourism can be consistent and supplementary, as they can profit from each other (Cater & Lowman, 1994, p.47). However if managed poorly, ecotourism could jeopardize of being a self-corrosive process, where it exterminates its assets tourism is depending on (Cater & Lowman, 1994, p.47).

Summarized it is therefore essential, to understand the concept of ecotourism in order to cope with it. The government needs to recognize that sustainable ecotourism development is only feasible if they first engage in the market, second review planning and implementation and third support local commitment (Cater & Lowman, 1994, p.82).

As seen in the past, it has become evident, that to shift towards a sustainable development, the incorporation of economy, environment and society towards this lasting movement, is necessary. As mentioned above, ecotourism is dynamic and reliant on the natural capital, such as environmental goods and services, and

it is therefore necessary for the industry to fund in ecosystem services (Dowling & Page, 2001, p.215).

#### *2.3.4.2 The triple bottom line approach*

However, as mentioned above, sustainability is far more than just looking after the natural environment, as it also deals with the social and economic influence of human activities. The difficulty for the Maldives is to stimulate the increasing economic development by offering economic and social advantages to the inhabitants, while maintaining the natural assets and marine biodiversity. 'The triple bottom line', abbreviated 3BL, is an integrated concept of sustainability, where all three components are distinguished.



**Figure 4: Triple Bottom Line (Insight Associates, 2010)**

Originally, the idea of the 3BL was used as a business performance framework measure in concern with company environmental reporting, where enterprises were communicating with stakeholders about social equity, economic wealth and environmental affluence (Elkington, 1997 cited from Dowling & Page 2001, p.216).

John Elkington (1997), the founder of the 'triple bottom line' argues, that enterprises should arrange three various bottom lines, firstly the measure of the financial performance, secondly the measure of social performance and thirdly the bottom line of the company's planet account, which accounts for how sustainable the company is. People, profit and planet are therefore the three elements of the 3BL. The main goal was to compute the financial, environmental and social performance of enterprises over a specific period of time (The Economist, 2009).

Today, triple bottom line reporting is an agreed approach in tourism, to display that the destination has procedures for a sustainable development. Dowling & Page (2001) state, that the 3BL management principle, in context with sustainable tourism, includes to position earnings next to the consideration for the natural environment while respecting human beings, which leads to the so called 'win-win-win' situation. This approach aims to manage all resources to an extent that social and economic demands are met while preserving the environment, the biodiversity and the culture.

Therefore destinations need to take all three components into account such as a destination's economic, environmental and social performance.

### **2.3.5 Island tourism impacts on the Environment, the Community and the Economy**

This chapter will emphasize the 3 environments of the 'triple bottom line' and highlight the various impacts, related to tourism growth on the environment, community and economy areas.

#### ***2.3.5.1 Island tourism Environment***

The fragile state the Maldives is in is demonstrated by the severe impacts of climate change, today. Natural resource loss is a predicament for the environmental condition but also for the tourism, which is dependent on the preservation and condition of the biodiversity. To maintain those unique places, there is a need for raising awareness, sensitivity and responsibility in the behavior and attitude of individual tourists. While most visitors claim, that they are aware of the impacts on the environment, resulting from tourism activities, most travelers intend to act as green tourists. However, with their visits, they are

'pushing against the carrying capacity and hence the sustainability of regional environment' (Cater & Lowman, 1994, p.33). Carrying capacity may be a good concept to monitor the impacts on the environment, due to tourism. Nevertheless with the increasing demand it might become difficult keep up. Yet, these are the roots of the conflict, as tourism is causing the loss of diversity but is dependent on the construct it is systematically destroying. However, the evaluations of compliance to monitor the carrying capacity of the islands are subject to judgment and determinations. These policies include, that the total area of tourism development is no greater than 20% of the island land area (Cater & Lowman, 1994, p.33). Moreover Zulfa et al. (2011) states, that 68% of the beach space must be assigned to guest rooms; 20% can be used for guest facilities, such as reception and restaurants, whereas the final 12% could be utilized for open space between guest rooms. If the demands were to increase, the limited resources available can only be used to a certain extent, which would make the increasing request difficult to trade with.

The environment does not only need to resist damages encouraged by human beings but is also exposed to natural disasters and its impacts, which can take on many forms, such as climate change, water rise and fishing biodiversity loss. It is therefore of utmost importance to the archipelago, to find an approach to successfully execute tourism without harming the environment. Increasing the awareness of visitors about global warming and the impacts on the environment caused by them plays a vital role to reduce consequences (Kikinger, 2013). The government and management should inform tourists about what's needed to sustain the environment they're visiting, and should also help local populations understand the importance and value of their home. Moreover, to achieve sustainable tourism, the government needs to plan the further development of tourism in detail, which requires the integration of the local community in the management and planning process.

#### *2.3.5.2 Island Tourism Communities*

Islands suffer from a range of impacts due to tourism, as discussed in the previous chapters. Indeed, in terms of island tourism communities, inhabitants did not only profit from the growing tourism development, they also had to abandon a lot, in order to give way to tourism. Mainly, they were forfeiting their control, when tourism tended to appear (Carlsen, 2011). The government

exerted a considerable political pressure on the local people, in most extreme cases; this even led to exploitation and suppression of the local inhabitants (Carlsen, 2011). This is already and must be revised to guarantee sustainable development.

As most of the tourism destinations, also the Maldives are struggling with guest relations and tensions, whereby in this situation the geographical position must be strongly taken into account, the difficulties this collision of different interests, where people are living closely together, are extremely challenging. Differently to urban tourism destinations, where people can escape from tourism by moving to the more suburban boroughs, the Maldives islands only have a narrow capacity of living area.

To achieve a better interconnection between the host country and tourism, ethnic and culture of the local community needs to be respected and enhanced, which simultaneously would lead towards sustainability (Carlsen, 2011). But also the locals need to understand that tourism is a valuable contribution to their living standards. Consequently, government needs to assist them in acknowledging the possibilities and to capitalize on these opportunities in order to take part of the growth in tourism. 'Therefore a good training and education of the local community is demanded to actively participate in the economic benefits' (Carlsen, 2011).

Carlsen (2011) states that for a tourism-related economy to sustain itself, residents must be willing partners in the process and perceive tourism in a positive way. 'As long as there is some level of local input, you do maximize the probability of a good outcome' (Carlsen, 2011). To develop the perfect place to live and a successful and welcoming tourism destination, the Maldives must first satisfy the needs and wants of the local inhabitants.

Summarized, tourism can cause a community identity and pride. A positive meaning of community identity can be strengthened and tourism can also promote local communities to obtain their traditions and identity. Tourism for the Maldives is the most effective way of generating wealth. It is important to consider the needs and the wants of the residents and that both, the government and the residents strive the same aim towards "liveability" and "visitability".

### *2.3.5.3 Island Tourism Economies*

Carlsen (2011) is questioning, why islands, such as the Maldives, would encourage tourism, knowing all the negative impacts tourism exposes to the community and the island. The question is easy to answer; the Maldives is in a predicament, where they only have restricted possibilities for growth. According to Tourism and Events Queensland (2013) 'Tourism is one of the most effective ways of redistributing wealth, by moving money into local economies from other parts of the country and overseas. It brings income into a community that would otherwise not be earned.'

However, some issues need to be observed when reflecting upon island tourism economies. Referring to Carlsen (2011), the Maldives is highly reliant on external economies and governments for income and resources. The islands are having restricted abilities to produce goods and services and most of what they are selling, needs to be imported, meaning that most of their incomes are flowing to other countries, from where they obtain their goods (Carlsen, 2011). Hydroponics gardens are a major step forward to become more independent, however small islands often do not have the amount of space to build them.

Another problem is posed by external impacts, as islands like the Maldives are often subject to market forces and trends, where only one event can affect the tourism arrivals, such as political events, natural disasters and the following effects of these impacts (Carlsen, 2011). According to the MOTAC (2012), tourism was significantly impacted by the tsunami in 2004, which concluded in a strong reduction in arrivals in 2005. Moreover, Carlsen (2011) adverts to the fact that the volume and pace of tourism put pressure on the Maldives, as small islands are often not able and do not have the tools to cope with this rapidly growing tourism. Carlsen (2011) states that 'the external hotel chains, airlines and tour operators are the ones who profit most from this rapidly growing tourism instead of the locals, who would need some help to acknowledge to see the opportunity and to capitalize on these possibilities to participate actively in the growth of tourism.'

Furthermore, infrastructure is also a sensitive subject, as it is obviously needed in tourism but also again has negative impacts on the environment. Furthermore Carlsen (2011) argues that the costs for infrastructure on an island are approximately twice as high as on the main land. Islands need to make sure to be capable of hosting maximum capacity, meaning that they need to be in a position to control a maximum capacity, which is mostly happening only 3-4 months a year at the archipelago (Carlsen, 2011). Carlsen (2011) declares that sustainability requires such a control, signifying that their water, utility and waste management systems need to be able to deal with 100% occupancy. Hence a good management of the islands and governmental support in terms of investment and regulations is required to fulfill these demands.

Summarized, islands need to be understood from multiple perspectives such as from a social, ecologic and economical angle. The objective is to balance the economic prosperity for the residents' social cohesiveness for the islanders and visitors and the conservation of the environment, which is the main reason and often the pull factor which encourages people to visit (Carlsen, 2011). All of these factors need a good management where government comes into play.

## **2.4 The role of the government facing growing tourism in the race against the clock to prevent climate change**

This chapter aims to generally highlight the historical and current situation of the Maldivian government. Moreover recent objectives and plans will be explained to manage the impacts of global warming.

### **2.4.1 Governmental situation**

The archipelago is facing various challenges that need to be monitored in order to cope with the increasing tourism demand. Therefore, government and government agencies are required to design regulations, policies and programmes but also to maintain and realize them (Carlsen, 2011).

#### ***2.4.1.1 Current political situation***

The Maldives is a republic with a parliamentary style of government and a strong executive (Carlsen, 2011). In 2008, the first democratic state was prescribed, which allowed the country to make significant improvements in

solidifying democracy (Burke, 2012). After the first ever-democratic election in the Indian Ocean archipelago nation, a three decade dictatorship of Mamoun Abdul Gavoom was ended (Burke, 2012). The new president at this time, Mohamed Nasheed achieved to develop a new constitution and made great advancements in human rights matters (Burke, 2012).

In 2009, the former president emphasized, to set an example for the rest of the world and to make the archipelago a carbon neutral country by 2020, excluding air travel, which is crucial to Maldives' tourism-based economy (Clark, 2011). In addition, the former president of the Maldives announced, that the country needed to look for land in other countries, as moving was a possibility the government needed to arrange for (Karthikheyan, 2012, p.350).

On October 17, 2009 Mohamed Nasheed, chaired an exceptional conference with his cabinet to agree on a global carbon emission reduction (Ministry of Planning and Development, 2007). It was unusual, as the president and the other government officials were conducting this meeting under water. To raise awareness on the effects of global warming the archipelago was and still is facing, the president gathered with his eleven ministers to send the sincere message 'we must unite in a global effort to halt further temperature rises' (Gagain, 2012, p79). This underwater meeting was presented at the U.N. climate change summit in Copenhagen, to emphasize the fact, that small islands with low elevation might submerge due to sea level rise and that the continuing rising could lead to 'the death of a nation' (Gagain, 2012).

The major plan, was to move towards wind and solar power, with the goal to emit 60 percent of the country's energy, by 2020 (Clark, 2011). The former president stated that the expenses of the conversion would not exceed the current energy costs of the archipelago (Nasheed 2012). However, after his resignation on 7 February 2012, due to disputed circumstances, Nasheed claimed that emerging political vagueness and tensions from his deposition, made him loose hope to ever achieve these aims of carbon neutral developments (Nasheed, 2012).

In view of the current situation, president Waheed is focusing on decreasing erosions, to offer sanitation and water for the atolls, to provide higher education

institutions and to eradicate poverty in the country (Moosa, 2012). Moreover, the president declared, that government had invested a lot of time, efforts and funds on renewable energy in the Maldives to reduce costs on energy (Moosa, 2012). Furthermore, he emphasizes, that 'he is committing to trying to meet the carbon neutral goals of his predecessor, as well as to make the Maldives the world's largest marine reserve within the next five years five' (Merrett, 2012).

#### *2.4.1.2 Environmental policy*

The government and the industry have concluded, that the main capital of the Maldives, in terms of tourism, is the marine biodiversity and the intactness of the environment, whereby the majority of these assets are reliant on climate and weather patterns (Karthikheyan, 2012, p.350; Majeed, 2006). Change in weather conditions, due to global warming, can have a drastic negative effect on this main income generator (Karthikheyan, 2012, p.350). Sea level rise is of great concern for the Maldives and a lot of measures have to be taken for adaption and mitigation with the help of the international community.

There is a need of the Maldivian government to frame adequate policies and implementing them, while keeping the peculiarity of the islands in mind. The preservation of Maldives's delicate environment should be considered as most important, therefore a Ministry of Housing, Transport and Environment was inaugurated.

The archipelago is regularly attending in conferences and international meetings to detect a dissolution (Majeed, 2006). The National Development Planning (NDP) highlights the concern of the Maldives sustainable development.

The 7th National Development Plan for the Maldives was submitted in 2010, which alleviated the risk represented by global warming and its involved consequences and to implement economic and environmental growth while increasing the well-being of the locals. According to Zulfa and Carlsen (2011), the NDP, which is elaborated every five years, gives directions on the social, environmental and economic development of the archipelago. The main goals of the 7th National Development Plan were to:

'Mitigate the risks posed by future tsunamis and rising sea levels, help realize economies of scale in the provision of public and private services in the atolls,

strengthen service quality in the atolls and to improve the welfare of the people` (Ministry of Planning and Development, 2007).

The protection of the environment is a main concern of the archipelago, which is protected under the Maldives Law on the Protection and Preservation of the Environment. In order to continually monitor progress, the Maldives implemented the National Environment Action Plan. The first National Environment Action Plan, abbreviated as NEAP, in 1989 was performed with the support of the United Nations Development Programme (Zulfa & Carlsen, 2011, p.220). Zulfa and Carlsen (2011), emphasize, that this plan contains information about development regulations as well as environmental management planning instructions but most importantly human rights. The Maldives is currently implementing their third National Environment Action Plan, whereby precedencies are copious and including goals such as the protection of critical infrastructure, the protection of human settlements, to increase the resilience of coral reef systems, climate change, and more (Zulfa & Carlsen, 2011, p.220).

According to Maldivian Democratic Party (cited from Zulfa & Carlsen, 2011, p.218), 'various planning and policy mechanisms exist in the Maldives to assure that the impact on the environment from tourism-related activities is avoided. Prosperously tourism master plans have been applied since 1983 to achieve sustainable development by strictly following environmental plans.' The Maldives' primary industry is governed and controlled through a Tourism Master Plan, which specifies the flora and fauna of the archipelago as the greatest asset. The plan was made to keep the effects of tourism on the environment low.

The Maldives is currently under their Fourth Tourism Master Plan, which acts as a roadmap for the government and which main objective is to increase the overall number of tourists who are visiting the archipelago (Fourth Tourism Master Plan, 2012). Two other master plans, published in 1983 and 1996 and 2007 follow.

However tourism cannot expand unregulated, there are limits to growth, in terms of social and environmental carrying capacity, stating that there is no indefinite growth (Carlsen, 2011).

The carrying capacity is mainly an ecological concept, which is expressed as the relationship between a population and the natural environment. In greater detail, the World Tourism Organization determines carrying capacity as 'the level of visitor's use an area can accommodate' (Simón et al., 2004 p 277). To illustrate the exceeding of the carrying capacity, Sam Ham refers to the anthropologist John H. Bodley (cited from Sam Ham, 2006) who explains the subject he calls the ghost acres in 1965 which is, 'the amount of land needed by a nation to produce the equivalent amount of food it procures by trade and sea.' In fact, the food needed by a city's population, comes from invisible acres, which are, contrary to visible acres (coming from within), taken from net import. Furthermore the energy a city obtains from coal, petroleum, and natural gas can be expressed as "fossil acreage". Looking at these acres, one can realize how seriously exhausted the real physical carrying capacity on this planet is, in fact, according to the world carry capacity calculations of today, we would need a ghost acres of 10 planet earths (Sam Ham, 2006). Moreover he states, that carrying capacity and the real physical limits to growth have been exceeded on this planet, according to many economists, nearly a century ago.

Summarized, with this understanding of these fundamental principles, the government needs to find a balancing concept to support tourism development without compromising the social or natural environment. It must be comprehended, that achieving a growth in arrivals or a rise in the GDP, is often on the expense of social or environmental integrity (Carlsen, 2011). As mentioned above, tourism and leisure industries are the major source of income for the country, as they provide employment and other possibilities in the sector. However, the Maldives presents very special characteristics that cause further disadvantages, when facing tourism growth.

## **2.5 Challenges and opportunities of the growing tourism sector for the Islands**

It is obvious that tourism activities cannot escape without taking harm. Tourism, under further consideration, incorporates several benefits but also various disadvantages. On the one hand, tourism in the Maldives delivers significant

advantages to the economy as well as to the individuals and on the other hand it is responsible for environmental pollution, an increase of greenhouse gas emissions and debates of interest in dividing resources between inhabitants and tourists, which will be further analyzed in this chapter (Karthikheyam, 2012, p.345).

### **2.5.1 Opportunities of tourism in the Maldives**

Tourism is the strongest contributor to the countries revenue, and a great deal of the Maldives's economic rise was caused by the development of resorts and tourism (Karthikheyam, 2012, p.345).

Increasing tourism goes hand in hand with job opportunities, as one of the main advantages of tourism is employment potentiality to the Maldivian population. With the increasing visitors a fair supply of skilled labor will be assured for the long term.

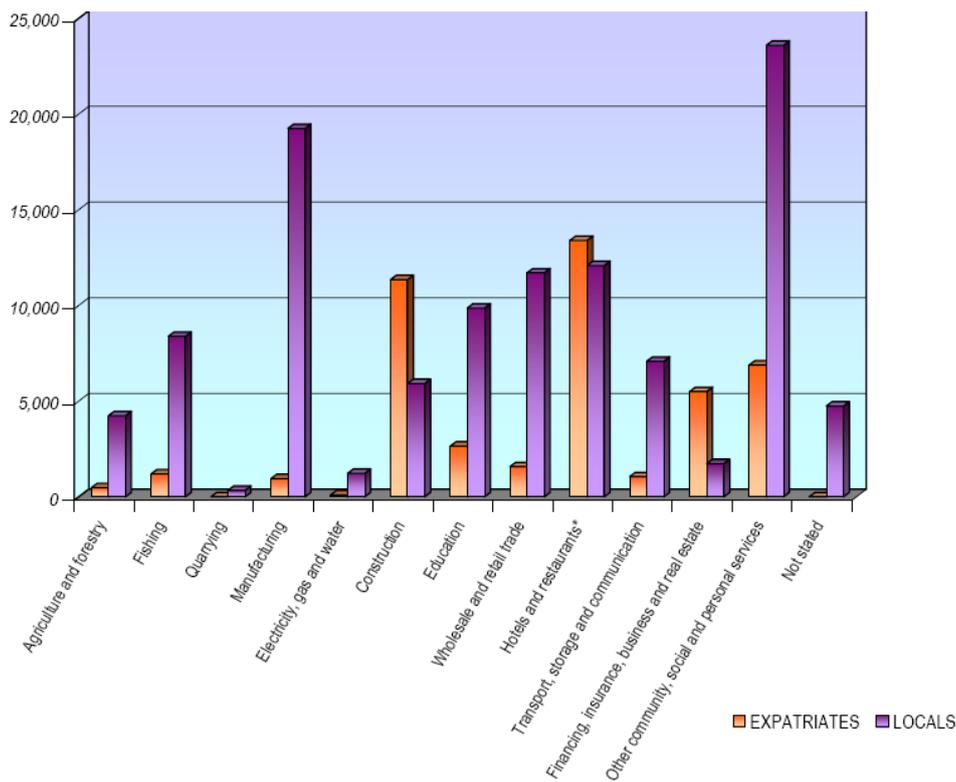
A new generation is ready to take over Shakeela (2007) states that out of about 300,000 people, living in the Maldives over 39% are under the age of 18. Moreover, looking at this high number of young citizen, the tourism and hospitality sector can be renowned as one of the main auspicious fields, to offer profitable job opportunities for the increasing young generation (Shakeela, 2007). However, it is questionable if the necessary trained and educated employees are on-hand and if the needed facilities to educate them are or will be available.

### **2.5.2 Challenges of tourism in the Maldives**

The Maldives is facing several challenges and obstacles that must be overcome in order to maintain the country's existence, by managing the necessary increasing tourism demand and at the same time, attempting to fight global warming effects.

However, the situation is not simple. That is why several aspects need to be considered and thoroughly thought through in order to be able to improve the circumstances.

The first concern, that needs to be addressed, is the labor situation and the educational opportunities offered by the country. The possibilities for employment in the Maldives are increasing; the local share of the jobs in the tourism and hospitality sector is proportionally humble (Shakeela, 2007). Even though, the Maldivian government employment regulation states, that resorts are obliged to engage at least fifty percent of residents, most of the managements are not able to follow through with this, as not enough skilled local workforce is available (Shakeela, 2007). Therefore a high proportion of expatriate employees are hired to carry out these vacancies (Shakeela, 2007). Due to these facts, it might become obvious, that expatriate employees govern the best-paid occupational groups, such as managerial and other senior positions, whereas the locals remain to fill up underpaid jobs, that require no, or only little qualifications.



**Figure 5: Comparison of Expatriate and Local Employment by Industry in March 2006 (Shakeela, 2007)**

As shown in figure 7, the Maldives demonstrates a large share of expatriate employment in several industries (Shakeela, 2007). The need for the Maldives to educate local workforce is becoming very important, since the demand for high-performance service is continually increasing. Moreover, attractive payment

must be offered to local skilled employees, which should make up for the costs of inhabitants, who are staying away from their families (Shakeela, 2007). It is evident, that some action must be taken in this field, to improve the present situation, by introducing various local education facilities as well as by providing better-paid jobs to the local communities.

Second, the consequences of waste on the environment can lead to great losses. Tourism is growing constantly and as a result, so is the waste and pollution generated by them. Waste generated due to tourism activities, was investigated to be much more than a simple household, in fact tourists produce about 16.5 kg of trash per week (Zulfa & Carlsen, 2011, p.219). The small islands struggle to cope with a relentless stream of rubbish produced by three-quarters of a million visitors (more than double of the domestic population), who are visiting the islands. The solution found by the Maldives was to transform one of its islands, named Thilafushi into the so-called Rubbish Island (Hall, 2012). This island was built about 20 years ago on regenerated coral reefs, Hall described the mass as 'clouds of pungent, toxic smoke rising from open fires, piles of filth made up of plastic bottles, crisp packets and consumer detritus... it's a far cry from the white sands, crystal-clear waters and gently swaying palm trees that we associate with the Maldives, the quintessential paradise island holiday destination set in the Indian Ocean.' Today, they ultimately dispel the idea of a dumping island where they burned 330 tons of waste every day because consequences can be seen already, such as environmental damage as plenty of lead, asbestos, and other poisonous materials have been offloaded into the sea. 'Little surprise then, that tourists on the holiday of a lifetime prefer to sip a cocktail and look the other way' (Hall, 2012). Today, according to Hall (2012) most of the cargo boats are transporting the rubble to India. A solid waste management system must be carried out but also recycling and refuse avoidance are very important issues for both, economic and ecological reasons.

Another problem, which occurred with regards to this increasing tourism industry, accordingly to Karthikheyan (2012) is that 'natural resource and environmental degradation associated with tourism activities are sometimes serious problems in countries like Maldives that are top tourist destinations, the management of natural resources to reverse this trend is thus one of the most difficult challenges for governments at different levels.' As a result, the major

consequences due to tourism are, the stress on scarce natural resources, destruction to the marine ecosystem and waste and pollution difficulties. Moreover Karthikheyen (2012) argues, that poorly controlled tourism development and environmental aggravation represent a severe danger to tourism.

In summery the most endangered natural resources are according to Karthikheyen (2012), fresh water, land and marine resources. The occurring impacts of successive waves of incurious tourists visiting these areas may gradually destroy these individual peculiarities, which represent the essential assets and therefore endanger sustainability (Cater & Lowman, 1994, p.81). Tourism is essential to the Maldives but as an ecotourism destination, the fragile assets of the archipelago are of utmost importance. Good management strategies and well thought of development plans are critical for the Maldives, but also proper planning for human resources are fundamental. Moreover, the Maldives needs to invest into education and training facilities to educate local people, but also provide appealing job opportunities to keep these skilled workforces.

### **3 Methodology**

In order to collect additional information, an expert interview was made.

Reinhard Kikinger, a leading expert in the field of marine biology, who is holding a PhD in marine biology, was interviewed. The expert lectures at several universities in Austria and his research interests comprise marine tourism, biodiversity and coral reefs. In 1998 he was offered a position in the Maldives' Tourist Resort Kuramathi, as a marine biologist, to help to react to the coral bleaching event. During his term of office, he developed the biggest Biological Station in the Maldives, which was built in Kuramathi.

As the interview was a primary data-gathering instrument, a semi-structured form was chosen. The decision to take a semi-structured interview was made in order to provide flexibility. The interview was recorded to avoid any loss of information and to ensure an accurate reflection of the conversation.

Moreover, the interview was conducted with a fairly open framework, which allowed gathering additional information in a focused, conversational, two-way communication. The main objective of the interview was to gain new ideas and visions, which are also, included in Chapter 4 Findings of the Study. The complete interview can be found in the Appendix 1.

## **4 Findings of the Study**

The main purpose of the literature review and the expert interview was to find answers to the main question of the study: Does the Republic of Maldives have the capability to handle the growing tourism demand, whereas facing the difficulties of global warming?

### **4.1 The changes and new options**

This chapter presents different approaches that could help the archipelago to deal with the growing tourism demand, when facing the difficulties of global warming. Adaption measures are of utmost importance for the Maldives, to safe itself from extinction.

Today, the Maldives are one of the leading countries in implementing complex engineering projects to fight sea level rise (Gagain, 2012). As for instance, ‘The Great Wall of Male’, a paid scheme, which is six feet tall and surrounding the capital, was constructed to decrease the impacts of flooding.

As explained earlier the archipelago depends heavily on both tourism and fishing as two of its major sources of income. To waive the revenues, generated from the tourism industry is therefore no option. However, finding sustainable procedures to conduct business in a responsible manner, by not harming the environment, is probably the best solution for the archipelago to be capable of handling the growing tourism demand, whereas facing the difficulties of global warming.

To better evidence the results achieved, one needs to understand the differences between soft and hard approaches. According to Sovacool (2011), the two types of adaptation pathways are the soft and hard adaptive measures, which have both been observed and used in the Maldives. On the one hand, soft adaptive measures focalize on community control, appropriateness, simplicity and natural capital, on the other hand hard adaptive measures incorporate large, capital intensive, complex, inflexible technology and infrastructure (Sovacool, 2011, p.1177). Hard and soft measures were first designated by Amory Lovins, during

the energy crises of the 1970s to describe an alternative future where renewable energy would replace the centralized energy system based on non-renewable resources such as fossil fuels (Sovacool, 2011, p.1177). Referring to Sovacool (2011), in association with climate change, soft and hard adaptation paths could be:

Hard Measures	Soft Measures
rely predominately on artificial human-built infrastructure	forms of natural infrastructure or natural capital, such as ecosystems and forests, together with low-impact technology
involve large-scale disturbances to local communities and/or ecosystems	empowering local communities, and building institutional capacity and community assets
be complex and capital-intensive	simple and modular technologies, relatively easy to understand, that do not require large outlays of capital or human resources
use technologies and/or processes owned by foreign firms	technologies and/or processes owned by local people
lack flexibility and adaptability to sudden changes in projections of climate change	the ability to respond to alterations in climate change projections

**Table 8: Hard & Soft Measures (Sovacool, 2011)**

Table 8, taken from Sovacool (2011), displays the hard and soft adaptation paths. On the one side, hard paths imply associations and ecosystems with the requirements and demands of adaptation programs. However, these methods are expensive, unrelenting and interlinked with major energy consuming instalments (Sovacool, 2011, p.1177).

Sovacool (2011) states, that soft adaptation paths bear several benefits, as they are resilient and would only incorporate small-scale peripheral adaptation arrangements. Moreover, they are not as cost-intensive as the hard-alternative and are attentive, when it comes to requirements of the environment and the local population (Sovacool, 2011, p.1179). Ayers and Forsyth (2009, cited from Sovacool, 2011, p.1179) argue that 'owing to their scale, soft paths are similar to community-based adaptation schemes that operate at the local level, rely on

participatory processes of stakeholder inclusion and build on existing cultural norms to address local development concerns, which are designed to address the locally and contextually specified nature of climate change by incorporating community-based and indigenous knowledge into locally appropriate adaptation projects.'

First, the Maldives' construction of Hulhumalè, would be a good example for the application of a hard measure. Hulhumalè, incorporated on March 23, 2005, is an artificial island which could be expressed as the 'Maldives' modern Noah's Ark' to rescue the people living on inhabited islands if they perish (Gagain, 2012). It is approximately as big as the current capital of the Maldives, but was constructed one meter higher than Malè (Gagain, 2012). The purpose of the island was not only to be a rescue ship, but also to solve the current problems of overpopulation, the capital is currently dealing with. In the long run, the government wanted to achieve a high-class world city, which could accommodate more than 60,000 people (Gagain, 2012). This approach was definitely a costly concept and probably not the most sustainable response to global warming. However, artificial islands might be a solution on a small scale, but this will not work for the whole nation (Kikinger, 2013).

Moreover, another preventive measure of the government, to response to these environmental changes, is the development of the 'Safer Island Development Program' (SIDP) with the objective to detect safer islands, also called 'focused or primary islands', which are islands that are more solid to climate change. The plan, quite simply, is to bank up these existing islands to withstand global warming (Gagain, 2012; Sovacool, 2011, p.1179). Referring to Sovacool (2011) the program has been established by the Seventh National Development Plan, which main objective is to find 10 focused islands, whereas these islands will serve as 'safe havens' for humans being constrained to relocate, because of climate change impacts. This program, is mainly demonstrating many qualities of the hard path.

Moreover, the construction of seawalls, as mentioned in the previous chapter, is also a typical hard measure approach. The Maldives islands show a significant necessity for shore protection; however, merely constructing seawalls would not be affordable to the archipelago (Sovacool, 2011).

According to Kikinger (2013), the best solution for the nation would be natural and indigenous methods. One soft measure, such as the soft coastal protection, where the islands are supposed to concentrate on the highest protection of the coral reefs, would be a favorable option (Sovacool, 2011). According to Sovacool (2011), these approaches have a good cost benefit ratio, and are one of the most sustainable ways to save the nation. There are several studies, which prove, that healthy coral reefs are the most efficient breakwaters and moreover they have the potential to grow with rising seawater levels (Kikinger, 2013). Also referring to Sovacool (2011), 'mangrove afforestation is a very good way of trapping sediment and breaking waves in terms of inundation' but islands need to detect, what functions best in the individual destination. In order to reach this protection, an environmentally responsible high-end tourism is necessary. The archipelago does generally not have the financial means to pursue hard engineered solutions. Therefore Sovacool (2011) suggests, rather spending the not available funds on these hard measurers, the country needs to develop their own, soft and natural possibilities to cope with the challenging situation.

Furthermore, referring to Kikinger (2013), information is a powerful tool. Most of the damage is done because there is a lack of information. Therefore, it is important, that tourism island leaders, as well as visitors share their knowledge and information about environmental behavior to act in a responsible way. 'Information is essential for sustainable tourism: We only protect what we love. We only love what we know. And we only know what we were taught' (Kikinger, 2013). Tourists have to be appropriate instructed and informed about the singularity of the region they are visiting and therefore get the knowledge how to act to reduce their environmental footprints during their stays. The destructive power of tourism should be clear to every visitor. A good example to inform tourists was provided by the Kuramathi team, who implemented an environment video, created by two Austrian students and a marine biologist. Also TUI supported the production of a video, of 10 minutes, that is about two visitors, a father and his son, spending their holiday on a tropical island, whereby the father is accidentally and unknowingly harming the environment and the „eco-aware“ son is solving and explaining the action. This plot resulted in a good and entertaining opportunity to advise the tourists on ecotourism etiquette (Kikinger, 2013).

Not only the tourists and local island leaders need to be informed, but also inhabitants need to be aware of how to deploy soft awareness measures. Education is therefore a very important keyword when dealing with soft measures. Kikinger (2013) emphasizes education instead of resignation to increase awareness about climate change. The public also needs to be trained and informed about the true consequences of climate change to make competent choices (Sovacool, 2011). The government as well as the public community needs to understand the importance of their ecosystem, especially the relevance of a functional coral reef. Sovacool (2011) highlights the idea of so called training teams, who visit the islands; 'to create awareness among the community so that they can take stock of existing vulnerabilities and soft adaptation measures.' Therefore information and education is essential to cause a shift in attitudes and behavior so vulnerable biosphere and environments can be obtained for future generations.

Further on, the Maldives is facing an energy crisis, which is not easy to overcome. The burning of coal is not a long-term solution to generate electricity, as it is causing the atmospheric carbon dioxide, which again makes a significant contribution to global warming (News, 2013). As mentioned already, the former president Mohamed Nasheed set a target in 2009, which was to make the archipelago a carbon neutral country within 10 years by designing a 100 per cent renewable energy project by the year 2020 (Energymatters, 2013). An important consideration of this project was to construct rooftop solar panels, to obtain clean energy, which will be supplied, to the Male region. However, under the present cabinet, the project is delayed due to disagreement over the funding and a lack of contribution of the local government. The latest news illustrated that 'the government is making preparations to commence the project during the next months' (News, 2013). This program was anticipated to attain 30 percent of the peak daytime demand of electricity and will balance out more than 300 tons of carbon dioxide every year (News, 2013). This construction would be extremely profitable for the archipelago. However such an adaptation will require first a functioning government and then funding in order to successfully achieve this vision.

Nevertheless, in order to achieve the best resolution, Sovacool (2011) attributes that a combination of both, the soft and hard adaptation paths, would function in

the best way possible. To achieve this mix, the Maldives should succeed the 'triple bottom approach', which aims to achieve environmental, economic and social targets in a balanced manner. On the Second International Conference on Climate Change and Tourism in Switzerland in 2007, it was discussed, that there was a need to instantly embrace various policies, which supported sustainable tourism, which could be assumed as the 'quadruple bottom line' including social, economic, environmental, and climate responsiveness to be added to the triple bottom line balance (UNWTO, 2008). Managing tourism responsible, can lead to a 'win-win-win' situation, when fair practices have been applied and no exploitation or threat to one of the three pillars "People, planet and profit" has taken place. Kikinger (2013) emphasizes, that a sustainable strategy would be to run a resort in such a way, that the structure of the ecological, economic and social could develop in a positive way without harming the natural environment.

While ecotourism is aiming to reduce the impact that tourism has on environment, one might argue, that travelling there at all is a contradiction. Studies show, that even, 'one cross-country, round-trip air ticket can create a warming effect of two to three tons of carbon dioxide per passenger' (Saladino, 2013). The ironic situation is obvious. As mentioned already, the archipelago relies greatly on tourism, mainly long haul tourism that heavily adds to carbon emissions. The question arises, whether those tourists should stop travelling to the country to save the Maldives from submerging into the sea? But then again, the vital receipts from tourism won't be generated. However, there are several actions one can take to help reduce the environmental impact from at home or during ones stay abroad.

Last but not least, the Maldives also needs to assume the worst-case scenario. In case of dawning or excessive loss of land mass to a point where it no longer can accommodate people, the Maldives prepares the final strategy in reacting to the rising sea level, where the country is building up investment funds, by setting aside \$1 Billion a year, to acquire new territory (Gagain, 2012; Kikinger, 2013). Gagain states that India or Sri Lanka are under discussion for the possible future home of the population of the Maldives, as they have similar cultures and climate as the archipelago. Australia is under discussion as well, as they provide unoccupied land areas. What will happen to their main source of income remains

dubious. However, the new land can create new opportunities for the nation, even if the world remains with the hope that this situation will never arise.

When everything else fails, the Maldives wants to be represented as a role model, who has done everything possible to rescue the islands. The country aims at good practices and lessons to be discovered from the archipelago to adapt to other small island developing states in a comparable situation. The Maldives wants to gain the reputation, that they were and still are leading the battle against global warming.

Nevertheless, now it is important to look ahead positively. There are various possibilities to support sustainable tourism and make the destination more resistant to global warming, by integrating a mixture of hard and soft measures. As coral reefs are the cheapest and most natural solution to resolve major environmental problems, the country should broaden their knowledge and skills for maintaining and repairing the coral reefs. The natural breakwaters are most suitable to protect the islands from erosion. Therefore, education should be provided to train locals in finding the right techniques to repair, construct and maintain coral nurseries. But also hard measures can contribute to defend the coastlines of inhabited and tourist islands. Artificial islands and safe islands, to stay afloat and to house up people, that also facilitate the overcrowded situation in Male, are cost-intensive but might be lifesaving actions, for a whole nation. However, the right decisions must be made by the archipelago in order to detect the best mix and most innovative approaches to make the country survive.

## **4.2 Limitation of this Study and Further Research**

Finally, a number of important limitations need to be considered. Studies can be limited in different ways. The current investigation was limited in scope and more data on climate change effects are clearly needed to provide a comprehensive solution to the problem. Experts do not have enough data to accurately predict the catastrophic effects of global warming. Therefore further research on global warming, sea level rise and extreme weather events would be advisable.

Furthermore, a number of different literatures were used to evaluate the research problem, which might have been designed for a different purpose than to the one of this study, which could lead to deviations.

Moreover due to the methodology used in this study, errors might occur, as only one expert was interviewed. This is a limitation that should be taken into consideration, that the research outcomes are mainly based on the expert interview and the literature review.

In further analyses the effects of climate change on the Maldives should be evaluated in detail, by also observing the current degree of growth of the coral reefs. Moreover a potential enhancement in environmental awareness of the population and of visitors should be measured by detecting a possible correlation between tourism development and coral reef conservation awareness.

## 5 Conclusion

Based on the findings presented and analyzed, the following conclusion was reached.

The thesis aims to evaluate, how the Maldives copes with the ever-growing tourism demand when facing climate change. The Maldives is considered as one of the most unstable and endangered nations in the world. Without a doubt, the main threat, the Maldives is facing is the global warming and its impacts. Climate change effects are very real for these tropical islands and pose a huge problem. The rising ocean levels jeopardize the nation's tourism-dependent economy and the very existence of the archipelago. The increasing ocean levels do not only endanger the existence of the Maldivian population but also the biodiversity and the animals in the country are highly threatened. One can say, that humans can easily be moved to so called artificial islands or to another country, but exporting and keeping this diversity of species will almost be impossible.

In the future, climate change will threaten the entire nation's existence. However not only the effects of global warming put a risk on the country, but also the geographic and geophysical attributes of the archipelago make the islands belong to the most vulnerable countries on earth. The islands are sensitive locations, which are isolated and very fragile in their structure. The low elevation, the vulnerable ecosystem, the geographical dispersion and isolation, the restricted natural and human resources and the dependence on the external markets, further weakens the countries performance.

In order to protect the environment, the Maldives stepped up and became a leader in the field of ecotourism, where environmental protection is a major issue. Maldives' Tourism is an industry with substantial size and financial significance to its economy. But the relationship between tourism and the environment is complex, as many conflicts and problems are triggered by tourism activities. Nowadays, the increasing tourism demand, which comes along with the increasing infrastructure development, puts additional stress on the very same ecosystem that draws tourists to the archipelago. Tourism provides significant economic advantages for the country; however, its fast development is also accountable for adverse environmental and socio-cultural

effects. Yet, also tourism reacts sensitively to environmental disasters and the destruction of the nature, as many visitors are mainly attracted by the diverse and intact underwater landscapes. It is obvious, that the preservation of the environment, while maintaining the archipelagos economy is a difficult but necessary mission. As the environment and the overall nature are changing in a more than rapid way, people are recognizing the importance of sustainable behavior. It is everybody's behavior that is either contributing to the preservation of nature or in a negative way contributing to the destruction of our precious world.

It is crucial, for the government to comprehend this difficult situation. Moreover, they need to support local communities with education and information, train them to make reasonable decisions in the long run and find successful and sustainable solutions to continuously exercise tourism development whilst maintaining the natural and social environment for the Maldives. Therefore it is of utmost importance that the government along with inhabitants and managers pursue and practice sustainable tourism.

Therefore it is important to find alternative solutions to keep the nation from drowning, which are evaluated throughout this paper. Experts believe that an intact coral system and mangrove forests could be the life-saving solution for the archipelago, as with the increasing sea level, corals would mount along. Moreover, corals serve as natural breakwaters, which can help to protect the coastal from erosion. In addition, coral reefs are a powerful attraction for the archipelago, but they are highly threatened by human activities and global warming effects. Unfortunately, those potential saviors have been suffering significantly from natural and anthropogenic threats since decades. The mass coral bleaching in 1998 during the El Niño-event destroyed most of the country's shallow reef corals, which had very strong impacts on the environment and economy. But also the edification of the resort islands, when tourism started, was destructive for the coral reefs. It is a fact, that global warming, worldwide, needs to stop or at least needs to be cut back, in order to rescue the nation. To obtain a global consensus, people worldwide need to understand that climate change is an international legal crisis and needs to be controlled on an international level.

Another solution, mentioned in the thesis, is the construction of artificial islands that may provide a practical solution to work against the impacts of climate change, although these projects are very cost intensive. Also, the question of future legal provisions for man-made islands remains, as currently artificial islands still are limited under international law, and should therefore be expanded for a new law (Gagain, 2012).

Ecotourism as well as protected zones are definitely the cheapest and best solution to support the coral reefs to recover. However, if this restoration will happen in time remains unsure and questionable.

It is evident, that the country has many challenges to overcome. If global warming is continuing and the pace of sea level rise accelerates, the Maldives will most probably vanish. This frightening scenario has not happened yet, but the possibility that these threats are occurring are real and can only be fully dealt with by international actions. The world needs to understand, that climate change and sea level rise do require global participation and commitment.

## 6 References

- Becken, S. & Hay, J. (2007). *Tourism and Climate Change: Risks and Opportunities*. Channel View Publications. Clevedon. UK. 48-49.
- Burke, J. (2012). Maldives' political instability allows gang violence to flourish. *The Guardian*. [Online]. 22 October. Available from: <http://www.guardian.co.uk/world/2012/oct/22/maldives-political-instability-gang-violence>. [Accessed: 22 May 2013].
- Carlsen, J. (2011). *Island Tourism. Island tourism sustainable perspectives*. Wallingford, Oxfordshire, UK: CABI 215-226.
- Carlsen, J. (2011). *Island Tourism. Island tourism sustainable perspectives*. Wallingford, Oxfordshire, UK: CABI 215-226. [Online]. Available from: <http://www.youtube.com/watch?v=PDQr38gWDj8> [Accessed: 13 February 2013].
- Cater, E. & Lowman, G. (1994). *Ecotourism: A Sustainable Option*. Chichester: John Wiley & Sons. 68-87.
- Church, J.A., White, N.J. & Hunter, J.R. (2006). Sea-level rise at tropical Pacific and Indian Ocean islands. *Global and Planetary Change*. 53 (3). Hobart. Tasmania. Australia. 155-168.
- CIA World Factbook (n.d.). Maldives Economy Profile 2012. [Online]. Available from: [http://www.indexmundi.com/maldives/economy\\_profile.html](http://www.indexmundi.com/maldives/economy_profile.html). [Accessed: 13 February 2013].
- Clark, D. (2011). Maldives crowdsources 2020 carbon neutral plan. *The Guardian*. [Online]. 22 September. Available from: <http://www.guardian.co.uk/environment/2011/sep/22/maldives-help-carbon-neutrality-plan>. [Accessed: 22 May 2013].
- Domrös, M. (2004). Nachhaltige Fremdenverkehrsentwicklung durch Touristen-Isolate auf den Malediven. Teoksessa H. Egner (toim.) *Tourismus-Lösung oder Fluch. Die Frage nach der nachhaltigen Entwicklung peripherer Regionen*. Mainz. 95-106.
- Dowling, R. & Page, S. (2001). *Ecotourism*. Prentice Hall. Pearson Education. Harlow. UK.
- Energy Matters. (2013). *Energy Matters - Bringing Solar Power To The Maldives* [Online]. Available from: <http://www.energymatters.com.au/renewable-energy/solar-power/maldives-solar-power.php> [Accessed: 13 February 2013].
- Fourth Tourism Master Plan 2013-2017. (2012). Ministry of tourism Arts and Culture, Republic of Maldives. DRAFT 1. Malè. Republic of Maldives.

- Gagain, M. (2012). Climate Change, Sea Level Rise, and Artificial Islands: Saving the Maldives' Statehood and Maritime Claims through the Constitution of the Oceans. *Colo. J. Int'l Env'tl. L. & Pol'y. Colorado*. 23-77.
- Hall, C. (2012). Paradise trashed: The beautiful island in the Maldives that's been reduced to a pile of rubbish. [Online]. Available from: <http://www.dailymail.co.uk/home/moslive/article-2162653/Maldives-island-paradise-Thilafushi-trashed-reduced-pile-rubbish.html> [Accessed: 13 February 2013].
- Ham, S. (2006) Travel show podcast Nr 11, [Online]. Available from: <http://travel.thepodcastnetwork.com/2006/03/30/travel-show-011-hot-coffee-brown-pants-and-the-sustainability-of-tourism/> [Accessed: 8 February 2013].
- Hay, J., Vereczi, G., Abdulla, A. & Saleem, A. (2008). Integrating Tourism into Adaptation to Climate Change in the Maldives. Oxfordshire, UK: CABI 215-226.
- Insight Associates. (2010). Insight Associates [Online]. Available from: <http://www.insightassociate.com/sustainability.html> [Accessed: 22 February 2013].
- IPCC. (2007). IPCC Fourth Assessment Report: Climate Change. [Online]. Available from: [http://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/spmsspmm-understanding-and.html](http://www.ipcc.ch/publications_and_data/ar4/wg1/en/spmsspmm-understanding-and.html) [Accessed: 22 February 2013].
- Karthikheyan, T.C. (2012). Environmental Challenges for Maldives. SAGE Publications. [Online]. (*South Asian Survey* 17: 2 (2010): 343–351). Available from: <http://sas.sagepub.com/content/17/2/343>. [Accessed: 22 May 2013].
- Majeed, A. (2006). Implementing Tourism Adaptation to Climate Change in the Maldives. *Maldives*. 3-23.
- Maldives. Ministry of Planning and Development (2007). Seventh national development plan, 2006-2010: creating new opportunities. Male: Govt. of Maldives, Ministry of Planning and National Development.
- Maschinski, J., Ross, M.S., Liu, H., O'Brien, J., Von Wettberg, E.J. & Haskins, K.E. (2011). Sinking ships: conservation options for endemic taxa threatened by sea level rise. *Climatic change*. 107 (1). 147–167.
- Matthews, K. (2012). 2 billion global travelers by 2020? [Online]. 2012. 2 billion global travelers by 2020? | World Economic Forum. Available from: <http://www.weforum.org/content/2-billion-global-travellers-2020>. [Accessed: 5 May 2013].
- Merrett, N. (2012) Maldives committed to carbon neutral aims despite political uncertainty [Online]. Available from: <http://minivannews.com/society/maldives-committed-to-carbon->

- neutral-aims-despite-political-uncertainty-45440 [Accessed: 22 May 2013].
- Moosa, H.F. (2012). HaveeruOnline - Global warming won't submerge Maldives: President. [Online]. 2012. Available from: <http://www.haveeru.com.mv/news/44118>. [Accessed: 22 May 2013].
- MOTAC. (2012). Yearbook\_2012.
- Nasheed, M. (2012). In the Maldives' Strangled Democracy. The New York Times. [Online]. 8 February. Available from: <http://www.nytimes.com/2012/02/08/opinion/in-the-maldives-strangled-democracy.html>. [Accessed: 22 May 2013].
- News, M. (2013). Maldives' solar ambitions stall due to politics, financing, "restructuring". Minivan News. [Online]. Available from: <http://minivannews.com/politics/maldives-solar-ambitions-stall-due-to-politics-financing-restructuring-53634> [Accessed: 5 May 2013].
- Robinson, JJ. (2010). Maldives Suffering worst coral bleaching since 1998 [Online]. Available from: [.http://minivannews.com/environment/maldives-suffering-worst-coral-bleaching-since-1998-8132](http://minivannews.com/environment/maldives-suffering-worst-coral-bleaching-since-1998-8132) [Accessed: 5 May 2013].
- Saladino. (2013). Sustainable at 30.000 Feet: Eco-Friendly In -Flight Dining [Online]. Available from: <http://blog.shermanstravel.com/2013/04/22/eco-friendly-in-flight-dining/>[Accessed: 8 May 2013].
- Sandee. (2011). Can Tourism can pay for Conservation? [Online]. Available from: [http://www.sandeeonline.org/uploads/documents/publication/957\\_PU\\_B\\_Policy\\_Brief\\_52\\_Md.\\_Shumais.pdf](http://www.sandeeonline.org/uploads/documents/publication/957_PU_B_Policy_Brief_52_Md._Shumais.pdf) [Accessed: 8 May 2013].
- Shakeela A. (2007). The Case of the Maldivian Tourism and Hospitality Industry. Queensland. Brisbane.
- Simón F.J., Narangajavan Y. and Marqués D.P. (2004), Carrying capacity in the tourism industry: a case study of Hengistbury Head. *Tourism Management* 25 (2004), 275–283.
- Sovacool, B.K. (2011). Hard and soft paths for climate change adaptation. *Climate Policy*. 11 (4). 1177–1183.
- Sovacool, B.K. (2011). Perceptions of climate change risks and resilient island planning in the Maldives. *Mitigation and Adaptation Strategies for Global Change*. 731–752.
- The Economist (2009). Idea: Triple bottom line. The Economist. [Online]. Available from: <http://www.economist.com/node/14301663>. [Accessed: 5 May 2013].

Tourism and Events Queensland. (2013). How Tourism Benefits Communities [Online]. Available from: <http://www.tq.com.au/resource-centre/community-engagement/how-tourism-benefits-communities/> [Accessed: 5 May 2013].

Zeenaz, H., Lema, J. & Agrusa, J. (2012). Enhancing the cultural tourism experience through gastronomy in the maldives-1.pdf.

Zulfa, M., and Carlsen. J. (2011). "Planning for Sustainable Island Tourism Development in the Maldives." In *Island Tourism Sustainable Perspectives*, edited by J. Carlsen and R. Butler. Wallingford, UK: CABI, pp. 215-27.

## Appendices

### Appendix 1

#### In-Depth Interviews

Reinhard Kikinger, 07.05.2013, 12:00-13:15, Vienna

**1. Can you tell me something about your background and how you ended up joining the Kuramathi team.**

I am holding a PhD in marine biology. I have worked in several research projects from jellyfish population outbreaks to environmental impacts by offshore oil production.

In 1998 the Maldives Tourist Resort Kuramathi announced the position for a marine biologist. The reason was a massive coral bleaching event in the whole Indian Ocean. The marine biologist should implement a small Biological Station on Kuramathi, should provide information to tourists about the coral reef ecosystem and should develop strategies for better reef protection. I applied for this position and was lucky enough to get it.

**2. How would you personally define sustainability?**

That depends on the scale of investigation.

Example 1: A Maldivian Island Resort. A sustainable strategy would be to run the resort in a way that ecological, economical and social structures could develop at the moment and in the future in a positive way.

Example 2: The global scale. At the moment I cannot see any sustainable development. A growing population with growing demands on an over-populated planet has already an "ecological footprint" which is far away from sustainability.

**3. In what ways do you anticipate climate change will affect the Maldives?**

The predictions are:

- Rising seawater levels. This is a huge problem for islands, which are not higher than 1-2 meters. However, there are many different scenarios about the magnitude of the anticipated seawater rising.
- Rising seawater temperatures. This is problematic for coral reefs, because the warming ocean might trigger coral bleaching more often.
- Acidification. The pH-value of the seawater will decrease due to the high carbon dioxide content of the atmosphere. This acidification of the ocean has negative consequences for all organisms with calcium carbonate skeletons, including reef-building corals.

**4. What should inhabitants of the Maldives do to prepare for climate change? What should visitors of the Maldives do to prepare for climate change?**

Local population: Education instead of resignation. It is important that political leaders and the public realize the importance of coral reefs. The Maldives consists of atolls, built by corals. The coral reefs are natural breakwaters that protect the coasts from erosion. The best possible protection of the reefs should be a national goal.

Visitors: avoid any unnecessary environmental damage. Get as much information about your holiday destination as possible: not only about the number of bars and spas on the island, inform yourself about the local ecosystem as well. You also have the opportunity to compensate the carbon dioxide production of your journey by joining programs of special organizations like Atmosfair and others.

**5. What are the inhabitants of the Maldives doing to reduce the threat of climate change?**

The biggest project is the artificial seawall around the capital Malé. This wall of massive concrete elements should protect Malé from erosion by rising seawater levels. In addition, the artificial island Hulhumale was built close to the capital and to the international airport Hulhule. Several departments of the government are assessing different strategies how to adapt to climate change. The underwater conference of President Mohamed Nasheed together with his cabinet in 2009 received worldwide attention, to demonstrate the impact of rising seawater for these remote

islands. The same president started campaigns for the local and international reduction of carbon dioxide emissions.

**6. Who should take responsibility / leadership in terms of climate change adaptation?**

The government and the political parties would take leadership. The former President Nasheed had promising concepts, however he was revolted against.

**7. In what way do you think the Maldives can be a role model for other countries in terms of climate governance?**

Remote islands like the Maldives are excellent role models because positive and negative developments are much more obvious than in highly complex societies.

One example is the energy supply. Although solar radiation is very high in the Maldives, mainly fossil energy like diesel is used for the electricity plants. The ambitious plan of Nasheed was to develop the Maldives until 2020 to the first carbon neutral country in the world. Fossil energy should be replaced by renewable energy such as photovoltaic panels, solar collectors, wind wheels, wave energy and biomass.

**8. What is Kuramathi's overall vision when it comes to environmental sustainability?**

The combination of economic success and environmental responsibility is Kuramathi's vision. Examples: the reduction of energy consumption, state of the art sewerage treatment plant, garbage separation, protection of the coral reef.

**9. When and why did Kuramathi become interested in sustainable development.**

After the massive coral bleaching in 1998 it became very environmentally interested. It became obvious that healthy coral reefs are essential for the future of the Maldives.

**10. What marine projects is Kuramathi currently involved with?**

Kuramathi is currently involved with:

- Permanent appointments with resident marine biologists in the Eco Centre
- The fish and coral reef monitoring
- Educational programs for the local school on the neighbor island Rasdhoo
- Regular informational meetings and speeches for visitors about the environment
- Special presentations about the marine life.
- Coral nursery

**11. How can sustainable island tourism replace other non-sustainable economic activities?**

Only with economic success, otherwise sustainable island tourism cannot survive.

**12. What are Kuramathis outcomes you are most proud of today?**

- The biggest Eco Centre in the Maldives and its high guest acceptance.
- The TUI International Environment Award 2010. The production and implementation of the animated video clip for non-English speaking tourists 'Save the Maldives'
- The ban of night fishing with tourists saved thousands of reef fish/corals from death/ breakage.
- The good cooperation with local schools and with tour operators.

**13. What are some objectives you would like to see implemented over the next 10 years?**

On a national level, I would like to see a government, which is aware of the environmental facts. Furthermore, I would like to see a tourism industry, which is realizing its power to destroy or to preserve the

holiday destinations and a growing environmental awareness of General Managers on island resorts.

**14. What do you think is the main threat the Maldives is facing?**

From the environmental point of view Climate Change is the main threat, with the effects mentioned in question 3.

From the social point of view the population growth with limited land resources and the unpredictable political developments including fundamentalist tendencies are problematic.

**15. How, in your opinion, should the Maldives handle their difficult situation?**

**Have you heard about the funds to buy new land to relocate the population and in general what do you think about artificial islands?**

Relocation of the population (Australia, Sri Lanka) would be the last strategy in reaction to rising seawater levels.

Artificial islands might be a solution on a small scale (like Hulhumale near the capital), but this will not work for the whole nation.

In my opinion the most important strategy would be: highest protection of the coral reefs because they have the potential to grow with rising seawater levels. Healthy reefs are the cheapest and most efficient breakwaters. Furthermore: concentrate on environmentally responsible high-end tourism.

**16. Do you think that the Republic of Maldives has the capability to handle the growing tourism demand, whereas facing the difficulties of global warming?**

Yes, as long as negative impacts are not too massive. In fact nobody knows exactly which of the numerous global warming scenarios will be the effective one.

**17. You've worked many years in the country. Have you got any lessons that you've taken away about how to manage tourism in a sustainable way?**

I have learned that environmental information is a powerful tool. Most damage is done because of a lack of information. Tourism managers and tourists with environmental awareness behave in a more responsible way. Therefore information is essential for sustainable tourism: "We only protect what we love. We only love what we know. And we only know what we were taught".