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Adapting the Cambodian Tourism Sector to Climate Change: Needs and Challenges

Bachelor-Thesis

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Abstract

This study focuses on the climate change adaptation of the tourism sector in Cambodia. Climate change adaptation has come into focus since it has generally been realised that climate change impacts are certain and inevitable, see reports such as the Stern report, in 2006, and the IPCC report, in 2007. In order to avoid significant damages and to reduce the consequences of impacts adaptation seems to be necessary in threatened regions around the globe. Cambodia is among the countries that are expected to face significant changes in their climate. The tourism industry in the country generates a significant share of the countries gross-domestic-product (GDP). The current state and future growth of the tourism sector could be affected by the impacts of climate change. In light of this there is and will be a need to prepare the sector for upcoming challenges.

The aim of this study was to investigate the possible and already existing responses of the tourism sector to climate change. To limit this research the study focussed on the adaptation strategies of the tourism sector to climate change impacts on a national scale. The study investigates existing climate change predictions and climate derived impacts on the tourism sector. An adaptation indicator catalogue is developed, which on the one side is used to investigate the tourism sector and on the other side to provide an overview about possible adaptation options for different stakeholders. In a final step already existing strategies and initiatives of the broader tourism sector was examined. The examination is based on a literature analysis and qualitative interviews with the most important stakeholders (such as the MoT, UNESCO, UNDP, Hanuman Tourism, etc.) of the sector.

The investigation has shown that the tourism industry could be affected through a higher frequency of floods and droughts, increased operation costs, a loss of attractiveness as a tourism destination, and other impacts caused by climatic changes. The adaptation indicator catalogue was effectively used as tool to investigate the tourism sector. It was divided into three dimensions: the governmental dimension, the tourism industry dimension, and the co-operational and communicational dimension. This structure enables stakeholders to easily understand the relevance of the adaptation options for them. From the examination of existing adaptation strategies it was realised that there are institutions, policies, initiatives, and programmes with a focus on climate adaptation already existent in Cambodia. Nonetheless, the Ministry of Tourism (MoT) as well as the tourism industry have only just started considering climate change as a threat to the future growth of the sector. One main issue was the unreliability of existing climate predictions, which are partly based on limited data or do not provide region specific predictions. There therefore is a large uncertainty that prevents the tourism industry from implementing adaptation actions. The examination shows that there is limited awareness among sector stakeholders and that future educational programs are needed to mainstream climate change among them. Another finding was that the current focus in the tourism sector and the aim of MoT to expand tourism in Cambodia often leads to insufficient consideration of regulations and laws, and natural impacts or occurring threats, such as those brought about by climate change are not incorporated in the development planning processes. In conclusion it can be said that the tourism sector is at the beginning of an adaptation process but there is a lot improvement needed to cope with future climate threats and to encourage sustainability in the sector.

Zusammenfassung

Diese Studie behandelt die Adaption des kambodschanischen Tourismussektors an den Klimawandel. Klimawandeladaption rückte in den Fokus, nachdem realisiert wurde, dass Klimawandelauswirkungen sicher und unumkehrbar sind. Siehe hierzu Reports wie den Stern Report, von 2006, oder den IPCC Report, von 2007. Um die Konsequenzen abzumildern und erhebliche Schäden durch den Klimawandel zu vermeiden, scheint Adaption für bedrohte Regionen notwendig zu sein. Kambodscha ist unter den Ländern, bei denen signifikante Klimaveränderungen erwartet werden. Die Tourismusindustrie des Landes generiert einen beachtlichen Anteil des Brutto Sozial Produkts. Der derzeitige sowie der zukünftige Zustand des Tourismussektors könnte durch die Klimawandelauswirkungen beeinträchtigt werden. Dadurch entsteht ein Bedarf, den Sektor auf zukünftige Herausforderungen vorzubereiten.

Das Ziel dieser Studie war es, die möglichen und bereits bestehenden Reaktion des Tourismussektors für den Klimawandel zu untersuchen. Um den Forschungsumfang einzugrenzen, konzentrierte sich diese Studie auf die Adaptionmöglichkeiten des Tourismussektors auf der nationalen Ebene. Es wurden existierende Klimawandelvorhersagen untersucht. Aus diesen wurden dann Auswirkungen für den Tourismussektor abgeleitet. Ein Adaptions-Indikator-Katalog wurde entwickelt mit dem einerseits der Tourismussektor analysiert wurde und anhand dessen andererseits ein Überblick über Adaptationsmöglichkeiten für verschiedene Beteiligte dargestellt wurden. In einem letzten Arbeitsschritt wurden bereits bestehende Strategien und Initiativen des weiteren Tourismussektors untersucht. Die Untersuchung basierte auf einer Literaturanalyse und qualitativen Interviews mit wichtigen Beteiligten des Sektors (z.B. das Tourismusministerium (MoT), UNESCO, UNDP, Hanuman Tourism, etc.).

Die Untersuchung zeigte, dass die Tourismuswirtschaft durch häufiger auftretende Dürren und Überflutungen, höhere Betriebskosten, eine reduzierte Attraktivität als Tourismusdestination und andere durch den Klimawandel verursachte Auswirkungen beeinträchtigt sein könnte. Der Adaptions-Indikator-Katalog wurde erfolgreich als Instrument zur Untersuchung des Tourismussektors eingesetzt. Er war unterteilt in drei Dimensionen: die Regierungs-, die Tourismuswirtschaft- und die Kooperations- und Kommunikationsdimension. Diese Einteilung ermöglicht es Beteiligten schnell die Relevanz der Adaptionmöglichkeiten für sich zu erkennen.

Durch die Untersuchung existierender Adaptionsstrategien wurde festgestellt, dass bereits Institutionen, Gesetze, Initiativen und Programme, die auf Klimawandeladaption ausgerichtet sind, existieren. Dennoch haben das MoT sowie die Tourismusindustrie gerade erst angefangen, den Klimawandel als eine Bedrohung für das Wachstum des Sektors wahrzunehmen.

Ein Hauptproblem war die Unzuverlässigkeit der bereits existierenden Klimawandelvorhersagen, welche teilweise auf begrenzten Datenmengen beruhen oder keine regionspezifischen Vorhersagen beinhalten. Diese Unsicherheit der Voraussagungen hält die Tourismuswirtschaft davon ab Adaptionsstrategien zu implementieren. Die Untersuchung zeigte, dass aber auch ein begrenztes Bewusstsein über Klimawandel im Sektor vorhanden ist und Bildungsprogramme nötig sind, um Klimawandeladaption zu verbreiten.

Ein weiteres Ergebnis ist, dass der derzeitige Hauptfokus des Sektors und das Ziel des MoT der Wachstum des Sektors ist. Dies führt des Öfteren dazu, dass Regulierungen, Gesetze, Umweltauswirkungen und andere Bedrohungen unzureichend wahrgenommen werden und nicht in die Entwicklungsplanungsprozesse einfließen.

Zusammenfassend lässt sich sagen, dass der Tourismussektor am Anfang des Adaptionprozesses steht, aber es noch viele Verbesserungen benötigt, um die Bedrohung eines sich wandelnden Klimas zu bewältigen und Nachhaltigkeit in dem Sektor zu etablieren.

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List of acronyms and abbreviations

AKP	Adaptation Knowledge Platform
CATA	Cambodia Association of Travel Agents
CCCD	Cambodia's Climate Change Department
ConCERT	Connecting Communities, Environment, and Responsible Tourism
DRM	Disaster Risk Management
ETS	Emissions Trading Schemes
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
HDI	Human Development Index
IGO	Intergovernmental Organisation
IPCC	International Panel for Climate Change
MoE	Cambodian Ministry of Environment
MoH	Cambodian Ministry of Health
MoT	Cambodian Ministry of Tourism
NCDM	Cambodian National Committee for Disaster Management
NCCC	Cambodian National Committee for Climate Change
NGO	Non-Governmental Organisation
SEI	Stockholm Environment Institute
SLR	Sea level rise
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNWTO	World Tourism Organisation

1. Introduction

During the last decade the tourism industry of Cambodia was one of the fastest growing tourism sectors in the world. Increasingly people are attracted to the temples of Angkor and the enhanced supply of tourism infrastructure along the coastline and in Cambodia's countryside. Yet the economy of the country is still recovering from decades of genocide and civil war. The tourism industry holds the potential to be one of the driving forces towards more economic growth and development.

However, the growth of the tourism sector could be harmed by global climate change. Climate change is causing a worldwide irreversible process of changing ecological, environmental, economic, and sociological conditions. While the industrialised countries mainly cause the anthropogenic share of the climate change, the majority of climate-related impacts are thought to affect developing countries such as Cambodia. The tourism industry is and will be facing a variety of impacts, including shorter seasons, higher operation costs, and increasing extreme weather events that affect the tourism infrastructure and supply.

This study focuses on the possible adaptation of the tourism sector in Cambodia to cope with the impacts of climate change. If Cambodia wants to sustain high economic growth in the tourism sector it should be necessary for the sector to adapt to the consequences of a changing climate. The aim of this investigation is to supply the tourism sector in Cambodia and its stakeholders with a range of adaptation options.

In the first part of the results various impacts on the tourism industry were derived from general climate impact estimations derived from various studies. From this a criteria catalogue of possible adaptation strategies is developed. The catalogue covers strategies from a national level perspective and provides an overview above all impacted stakeholders in the sector. This catalogue is then used in a second results part as an instrument to assess the current state of existing adaptation strategies. This investigation is on a literature survey and six in-depth interviews conducted in Cambodia and Bangkok from representatives of the main stakeholders involved in an adaptation process. In this study the stakeholders include persons from Ministry of Tourism (MoT), UNDP, Hanuman Tourism, UNESCO, ConCERT, Stockholm Environment Institute Asia.

Based on this examination this study delivers recommendations for the tourism sector on where adaptation strategies are most needed and what first steps could be taken.

1.1. Problem statement

Cambodia is expected to face various impacts of climate change. The consequences of a changing climate could be a tremendous hazard to the booming tourism sector of the country. The tourism industry has been rapidly growing since the last decade and is a significant driving force for the countries' economy. However, this rapid growth of tourism infrastructure and rising visitor numbers is leading to several problems, such as for example the building of hotel complexes on natural floodplains that can enhance the negative effects of natural catastrophes. The rainy-season of 2011 demon-

strated the weaknesses of disaster management in the Siem Reap and Battambang region, and has raised the question to what degree the tourism industry is able to adapt to climate change influences.

The country will most likely face more implications from different climate related factors harming its tourism development. These impacts include direct influences such as changing tourism seasons, increased extreme weather events, and sea level rise (SLR). From these main climate impacts different side effects are likely to evolve, including an increase of pandemic diseases, a loss attractiveness of landscapes and temples, problems with fresh water and food supply, and migrants from the Mekong Delta (comprehensive investigation of impacts in chapter 4.1). All of these impacts hold the potential to affect the tourism sector in Cambodia negatively. Therefore, it is important to understand the risks and be able to cope with the threat through a variety of possible adaptation strategies and options.

In order to attain this aim, the study will examine the following questions:

- What impacts is the Cambodian tourism sector going to face?
- What can tourism stakeholders in Cambodia do to adapt to climate change impacts?
- To what extent does the Cambodian tourism-sector already undertake action to cope with climate change?

1.2. Objective of study

The first aim of this study is to provide an overview of possible climate change impacts on the tourism sector in Cambodia. There are currently no scientific investigations on the link between climate change and tourism in Cambodia. Nevertheless, there are studies on the estimated impacts of the changing climate on the whole country which, from which consequences for the tourism sector can be derived. These changes will have consequences for the tourism sector. Therefore, there is a need to gain more understanding of the relation between climate change and tourism, in order to prepare the tourism industry for upcoming challenges.

The second aim of this study is to develop a variety of instruments and methods for the tourism sector in Cambodia to adapt to the possible impacts of climate change. The adaptation options are presented as an adaptation-indicator catalogue.

The third aim is the investigation of existing strategies and actions under taken by different stakeholders in Cambodia's tourism system. This estimation of the status quo visualises research gaps and highlights where further action will need to take place.

This study can raise awareness among different stakeholders and encourage new cooperation's to unite strategic responses to the occurring challenges. In addition this investigation, based on the case study of Cambodia, can provide a basic information resource for other South East Asian countries that will face similar impacts on their tourism sector. Instruments and methods used in this case study can be adapted to cases with similar circumstances and can provide useful information.

1.3. Structure

The study is structured in six chapters. The first chapter covers the introduction, the methods that were used for this study. The second chapter provides an overview about the theoretical background of tourism, climate change, the intersection of both, and the concept of adaptation and mitigation. This overview is based on the most important literature regarding these topics. The third chapter describes the field of study and includes the adaptation of the theoretical background on the actual situation of the tourism industry and climate change impacts in Cambodia.

The fourth chapter covers the analytical part of the study. Within this chapter the first part covers the description of possible impacts on the tourism industry. The second part shows the development of the criteria-catalogue based on the analyses of the field of study. The third part evaluates the results of the qualitative interviews and allows a rating of the components of the criteria-catalogue regarding the current state of the adaptation strategies in Cambodia. The fifth chapter focuses on detailed recommendations towards the tourism industry in Cambodia and is based on the findings of the fourth chapter. The sixth chapter ends the study with a summarising conclusion.

1.4. Methods

The overarching approach for the study is to investigate the relationship between the tourism sector in Cambodia and the impacts of climate change. To achieve this it is important to examine possible adaptation strategies and to critically assess the adaptive actions the tourism sector has already implemented. From this the study aims to provide a toolbox for further adaptation actions for different stakeholders in the Cambodian tourism industry.

In order to reach these objectives the whole study is based on the theory of deductive reasoning, moving “from the general to the specific. It moves from a pattern that might be logically or theoretically expected to observations that test whether the expected pattern actually occurs” (Babbie 2010, p. 23). The first part of the study (Chapter 2) includes a comprehensive literature analysis about climate change, tourism, and their relation to each other, to provide the reader with a framework of conditions and the current state of scientific research in these fields. Afterwards these theoretical basics were adapted to the specific conditions in Cambodia (Chapter 3).

The following steps form the bases of the three main goals of the study: to describe possible impacts on the tourism industry in Cambodia, the development of the adaptation-indicator catalogue, and the assessment of the current state of adaptation of the tourism sector in Cambodia to climate change. During the first of these steps, data from the first chapters is interpreted and new data is collected. Based on the information gained the adaptation-indicator catalogue for adaptation is created (see next chapter).

The developed adaptation-indicator catalogue is used, in the next analytical step, as an instrument for assessing the current state of adaptation to climate change. This step of investigation is based on a triangulation approach. Triangulation describes the surveying method “of fixing the position of an object by measuring it from two different positions, with the object being the third point of the triangle. It is

when different data/methods address the same question that true triangulation can be said to have occurred” (Veal 2006, p.107). The object in this case was the adaptation strategy of the tourism sector in Cambodia towards the impact of climate change. The triangulation is often used for research where both quantitative and qualitative methods are being used. However, this study is solely based on qualitative research methods. Characteristic for qualitative research is that “the information collected does not generally lend itself to statistical analysis and [is] not based on such analysis” and the qualitative techniques involve “gathering of large amounts of relatively detailed information about relatively few cases” (Veal 2006, p. 98-99). Therefore, the data gained through qualitative methods is not put together as a statistic to later be generalised. It generally requires more flexible approaches at the overall research design (cf. Veal 2006, p. 196).

According to Michael Quinn Patton qualitative findings can be extracted out of three kinds of data collection: “in-depth, open-ended interviews; direct observation; and written documents” (Patton 2002, p. 4). To gain a comprehensive approach to determine the targeted object the investigating part of this study is based on in-depth interviews and an analysis of written documents. Both methods and their applications are explained in detail below in chapter 1.4.2 and 1.4.3.

The qualitative data gained is later interpreted according to the structural content analysis in a last section of the study (This method is described in chapter 1.4.4).

1.4.1. Adaptation-indicator catalogue

The assessment of national adaptation strategies of the tourism sector in Cambodia is based on the newly developed adaptation-indicator catalogue. Theoretical approaches have shown that national adaptation strategies from tourism can be broadly divided into three dimensions: the governmental, the tourism industry, and the co-operational and communicational dimension. A dimension is defined by Babbie (2010, p. 132) as a “specifiable aspect of a concept”.

Each of the three dimensions is further structured: the governmental and tourism industry dimension into three different sub-sections and further indicators, and the co-operational and communicational dimension directly into indicators. An indicator is defined by Babbie (2010, p. 131) as “an observation that we choose to consider as a reflection of a variable we wish to study”.

The complete catalogue, including all country specific indicators, is in chapter 4.2. The whole study is based on assessing adaptation strategies on a national perspective; therefore it will not go too much into detail on specific adaptation options.

1.4.2. Literature data research

The literature analysis is a qualitative method for data evaluation. The documents which can be used as data resources are described by Patton (2002, p. 4) as “written materials and other documents from organizational, clinical, or programs records; memoranda and correspondence; official publications and reports; personal diaries, letters, artistic works, photographs, and memorabilia; and written re-

sponses to open-ended surveys. Data consist of excerpts from documents captured in a way that records and preserves context”.

The investigations in chapter 3 are based on reports from the Cambodian government and IGOs operating in Cambodia. The study attempted a holistic approach through considering different perspectives.

1.4.3. In-depth interviews

The in-depth (or informal) interviews are characterised by their length, depth, and structure. The interviews take at least half an hour, but can sometimes take several hours. The main distinction from a formal questionnaire is that the interview is often guided by checklist of topics. The in-depth interviewer has the opportunity to ask supplementary questions and ask the respondent to further explain answers. In the case that one interview is not sufficient, repeated interviews are possible. The interview itself is often audio-recorded and a verbatim transcript is prepared afterwards (cf. Veal 2006, p. 197-198).

In-depth interviews are often used in situations “where the information likely to be obtained from each subject vary considerably, and in complex ways” (Veal 2006, p. 198). This was to be expected for this study, as the different stakeholders of the tourism sector in Cambodia have a range of different expertise. Furthermore, in-depth interviews are “typically used to gather, ‘rich’, detailed qualitative data from a small number of respondents...” (Long 2007, p. 76).

The interview respondents were picked to gain representatives from all main stakeholders involved in the adaptation process or who could provide important information and insights of the current state in Cambodia. This selection process is known as theoretical sampling and defined by Mason (1996, p. 93-94) as “selecting groups or categories to study on the ... basis of their relevance to your research questions...”. Due to the limited time and scope of this study the interviews were confined to one representative of each party. But the study will provide a sufficient insight that is the main objective of qualitative methods. Henderson (1991, p. 132) mentioned that “the researcher using the qualitative approach is not concerned about adequate numbers or random selection, but [is] trying to present a working picture of the broader social structure from which the observations are drawn”.

For this study five out of six interviews were conducted onsite in Siem Reap and Phnom Penh in Cambodia and in Bangkok, Thailand. According to Babbie (2010, p. 275) this form of the interview provides the advantage that the interviewer can ask follow-up questions and observe the respondent during the interview. The sixth interview was conducted through a Skype phone call from Bangkok to Phnom Penh. Table 1 (p. 6) provides an overview about the interview partners, the abbreviations that are later used in the study, the date, the place, and the interview technique.

Table 1: Overview of conducted interviews (PHN=Phnom Penh, REP=Siem Rep, BKK=Bangkok)

Abbr.	Organisation	Name	Date	Place	Form
UO1	UNESCO	Philippe Delanghe	11.09.2012	PHN	In person
UO2	UNESCO	Blaise Kilian	11.09.2012	PHN	In person
UO3	UNESCO	Bun Hok Lim	11.09.2012	PHN	In person
MT	Ministry of Tourism	Sok Sokun	12.09.2012	PHN	In person
HT	Hanuman Tourism	Nick Ray	12.09.2012	PHN	In person
CC	ConCERT	Michael Horton	18.09.2012	REP	In person
SE	SEI Asia	Albert M. Salamanca	19.09.2012	BKK	In person
UP	UNDP	Phearanich Hing	20.09.2012	REP/BKK	Skype

The following list provides a short description of each interviewed organisation / stakeholder and the position of the interviewees:

- **UNESCO:** Delanghe, Philippe (Culture Program Specialist, Culture Unit); Kilian, Blaise (Program Coordinator, Culture Unit); Lim, Bun Hok (Program Officer, Culture Unit) – 11th September 2012, Phnom Penh, Cambodia.

UNESCO is a specialised agency of the UN. It aims through its work to contribute to the building of peace, the eradication of poverty, sustainable development and intercultural dialogue (cf. UNESCO 2012, [online]).

- **Ministry of Tourism of Cambodia:** Sokun, Sok (Director of Planning and Development Department) – 12th September 2012, Phnom Penh, Cambodia.

The Ministry of Tourism of Cambodia is responsible to manage and develop the tourism sector of the Kingdom of Cambodia (cf. MoT 2012, [online]).

- **Hanuman Tourism:** Ray, Nick (Company advisor and Author for the Lonely Planet) – 12th September 2012, Phnom Penh, Cambodia.

Hanuman Tourism is one of the oldest and biggest tour operators in Cambodia and started its business in 1990. The company nowadays runs its own hotel in Siem Reap and a television and film servicing company (cf. Hanuman Tourism 2012, [online]).

- **ConCERT:** Horton, Michael (Chairman and Founder) – 18th September 2012, Siem Reap, Cambodia.

ConCERT is a NGO with the aim to increase the effects from tourism by promoting and increasing the amount of support given to responsible and sustainable acting NGOs and businesses in and around Siem Reap. It is currently supporting 25 NGOs (cf. ConCERT 2012a, [online]) and has partnerships with 35 accommodation suppliers (cf. ConCERT 2012b, [online]), 7 Restaurants and Bars (cf. ConCERT 2012c, [online]), 10 tour operators (cf. ConCERT 2012d, [online]), and 7 other enterprises (cf. ConCERT 2012e, [online]).

- **SEI:** Salamanca, Albert M. Ph.D. (Research Fellow) – 19th September 2012, Bangkok, Thailand.

SEI is an independent international research institute with the goal to “bring about change for sustainable development by bridging science and policy”. They do this “by providing integrated analysis that supports decision makers” (SEI 2012, [online]).

- **UNDP:** Hing, Phearanich (Climate Change Policy Analyst) – 20th September 2012, Bangkok, Thailand / Phnom Penh, Cambodia (*Skype interview*).

UNDP is a program of the UN which cooperates with governments and other stakeholders in developing countries to “achieve Poverty Reduction and the Millennium Development Goals, Democratic Governance, Crisis Prevention and Recovery, Environment and Energy for Sustainable Development” (UNDP 2012b, [online]).

The organisations were contacted via email. In order to avoid the representatives of the organisations feeling under pressure or not prepared, all respondents received an email with a checklist of topics and a list of questions (see appendix 1 to 7) between three to seven days before the interviews were conducted. This way the respondents had the opportunity to prepare their answers, which had the advantage that the answers were approximately more relevant for the whole evaluation process of the sector. All interviews, except with MT were based on the provided questionnaire with additional following up questions on interesting topics. MT started with a presentation of the tourism sector in Cambodia and allowed the interviewer to ask following up questions. The question format used during the interviews was open questions, as they “allow a free response so that people answer using their own words” (Long 2007, p. 59).

A neutral atmosphere during the interview was important. The interviewer had to avoid agreeing – or disagreeing – with the interviewee or suggesting answers. This could have ‘led’ the interviewee and in the worst case changed the outcome (cf. Veal 2006, p. 199). The interviews were all audio-recorded and a verbatim transcript was written afterwards (see appendix 9-14 on attached CD). All respondents were asked for their permission beforehand; if they disagreed a transcript would have been written down.

1.4.4. Data evaluation

The examination process was based on the triangulation approach that meant that the data from the in-depth interviews and the literature analysis were both interpreted towards the same goal of assessing the adaptation strategies of the tourism sector in Cambodia. The first step was the qualitative content analysis which is defined as the “nonnumerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns of relationships” (Babbie 2010, p. 394). The qualitative content analysis builds on a category system, in this study on the theoretically developed adaptation-indicator catalogue, to evaluate the content of texts (including interview transcripts) systematically (cf. Mayring 2002, p. 114). Mayring (2002, p. 115) defined in 2000 three different approaches of the qualitative data analysis:

1. Summary: Goal of this analysis is it to reduce the material while keeping the main information.
2. Explanation: Goal of this analysis is it to find supplementary data for different aspects to complement the understanding of these aspects.
3. Structuring: Goal of this analysis is it to filter specific aspects from the texts according to pre-defined variables to receive a cross-section from the material or to assess the material according to specific criteria.

This study mainly used the third approach as the adaptation-indicator catalogue provided a pre-defined structure to assess the material according to the different criteria / indicators. Nevertheless, some aspects of the two other approaches were used as well. There were summarising approaches within the data analysis as well as the research for supplementary data through the triangulation approach where extra material was found to complement the results of the interview. The interpretation of data from different sources and interviews from representatives from various stakeholders with different perspectives enabled a comprehensive insight and allowed for the current state of adaptation strategies in Cambodia to be determined.

1.5. Limitations

There are a few factors that can limit the findings of this study. The impacts of climate change in Cambodia are based on limited country-specific research. There are existing studies from the IPCC, EEPsA, etc., but they mainly examine the whole region around Cambodia. Nevertheless, it is very likely that most of these impacts are and will take place, even if some reports might understate or exaggerate the outcome. It also needs to be considered that this study is dealing with the adaptation strategies on a national perspective and not locally. The study provides a good overview about the different strategies, but it is recommended to adapt them to the local circumstances and consider some further research about specific destination impacts.

Another limitation of this study is the number of interviewed stakeholders. The study includes a range of representatives from important stakeholders of the tourism and environmental development of the country. Nevertheless, more qualitative interviews with the stakeholders would minimise the deviation and lead to an increase in the significance of this study.

The choice of organisations being interviewed is another influential factor. In particular the attitude of the representatives could have influenced the research. Additionally, the possibility of limited knowledge of some interviewees about climate change could have influenced the results. Another issue in the case of the interview with the Ministry of Tourism representative was that English is neither the researchers nor the interviewees' first language.

2. Analysis of the current state of science of tourism and climate change

The following part of the study will provide an overview of the tourism sector, climate change, and how they mutually influence each other.

2.1. Tourism

Tourism is one of the world's largest and fastest growing industries. In 2011 worldwide tourism grew by 4,6 percent, compared to the year 2010. It reached 982 million international tourist arrivals, despite multiple crises in that year, such as the major political changes across the Middle East and North Africa as well as natural disasters around the world (cf. UNWTO 2012, p. 2).

There is no universally accepted definition of tourism. This study is based on the definition from the World Tourism Organisation of the United Nations (UNWTO)¹ online glossary. They define tourism as (UNWTO 2008, [online]):

“A social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors (which may be either tourists or excursionists; residents or non-residents) and tourism has to do with their activities, some of which imply tourism expenditure.

As such, tourism has implications on the economy, on the natural and built environment, on the local population at the destination and on the tourists themselves. Due to ... [a] wide spectrum of stakeholders involved or affected by tourism, there is a need for a holistic approach to tourism development, management and monitoring. ...”

They furthermore define a tourist (or overnight visitor) as a *visitor (domestic, inbound or outbound)* whose trip includes an overnight stay (UNWTO 2008, [online]). In this study the term tourist excludes business visitors. A business visitor is “a *visitor* whose main purpose for a tourism trip corresponds to the *business and professional category*” (UNWTO 2008, [online]).

Becken and Hay defined (2007, p. 10) the tourism industry as “the entirety of businesses involved in providing tourism products or services”. Furthermore they consider on a wider perspective a considerable input by governments (both national and local), local communities, and the environment into tourism. According to them the “combination of all those inputs into tourism ... [can be] referred to as the tourism sector” (Becken & Hay 2007, p. 11).

The tourism sector describes all the stakeholders who are involved in our modern understanding of tourism, whereas the environment can include NGO's and IGO's, and local civil societies. But there are other influential factors on tourism as a whole. The tourism sector has to consider changing weather and natural phenomena, as well as the cultural changes tourism can cause when visitors with other cultural backgrounds and material prosperity enter another country.

To ensure all components of tourism are considered, the theory of tourism as a complex system evolved. There is currently no widely accepted definition of a tourism system. For this study the term tourism system is based on the modularly tourism model. Freyer (2006, p. 45-47) describes tourism as a cross-section discipline which integrates different other scientific fields, such as economy, sociology, politics, psychology, leisure science, and ecology. Additionally disciplines such as medicine, ethnology, law, geography, and architecture could be added to the system as they all influence the tourism

¹ The World Tourism Organisation is the United Nations agency responsible for the promotion of responsible, sustainable and universally accessible tourism (UNWTO 2012 [online]). She often is shortcut as WTO instead of UNWTO which leads to confusion with the World Trade Organisation (WTO).

system in some ways. The understanding of a tourism system for this study is that the system implements all factors which influence the tourism in a country from the field of studies of the different mentioned scientific disciplines.

Another important factor is to consider that nearly all tourism entities have to compete internationally, and meet international quality standards (cf. Becken & Hay 2007, p. 85). It is hard for destinations, especially in developing countries, to meet the high expectations, without foreign investments. Therefore, most developing countries rely on foreign investors to grow their domestic tourism market. This is a trap for the country because they sometimes heavily invest in infrastructure projects, but most of the revenue from tourism is taken out of the country.

Furthermore there is the “tragedy-of-the-commons” or, how it was later called, the “common good disaster” (Gardner & Stern, 1996, p. 23):

“In tragedy-of-the-commons situations, behaviour that makes sense from the individual point of view, when repeated by enough individuals, ultimately proves disastrous to society. (...) Each individual gains, financially or otherwise, by consuming the natural resource. Each, furthermore, sees little harm in doing so since the resource is so huge in size and their impact on it is so small.”

This term includes the paradox that the tourism industry stakeholders all profit from common goods, such as unpolluted nature, clean air and water, but that not many of them are willing to pay for common-goods as everybody “owns” them and nobody holds private rights and is responsible (besides the state in some cases). Therefore, the government needs to intervene and act in the interest of the common-goods. In many cases this is not sufficiently undertaken and is a reason for the pollution of common-goods. This is a problem in countries with a weak state capacity as they are losing their natural, cultural, or man-made attractions.

These are only a few examples of the tourism system has to deal with, but they show that it is extremely difficult to predict, manage and control future changes with any level of practical significance and relevance (Becken & Hay 2007, p. 9). Nevertheless, it is important to undertake strategic tourism planning to be able to influence tourism development within a country.

2.2. Climate change

Climate change has been widely discussed and there have been various initiatives at the governmental and non-governmental levels to understand the changes and its effects. The IPCC defined climate change in one of its special report as “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcing, or to persistent anthropogenic changes in the composition of the atmosphere or in land use” (IPCC 2012, p. 5). Furthermore, the UNFCCC defines the whole climate system as “the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions” (UNFCCC 1992, [online]).

There has been widespread discussion related to carbon dioxide (CO₂) being released into the atmosphere. CO₂ is one of the most influential greenhouse gases (GHG) and also the one with considerable savings potential. GHG are defined by the UNFCCC as “those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation” (UNFCCC 1992, [online]). The anthropogenic gases are known as emissions that describe “the release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time” (UNFCCC 1992, [online]).

Increased emissions have affected the climate, weather, and flora and fauna of the globe. Relating to the aim of this study, the following part provides only a brief overview about the main known and estimated impacts. The main impacts of the climate change are temperature rise, sea level rise (SLR), more intense and frequent extreme weather events (such as floods, cyclones, and droughts), melting snow cover and glaciers, and changes of climate conditions among countries.

These major events cause secondary impacts, such as “climate refugees”, increase of vector-borne diseases (such as malaria, dengue fever, etc.), reduced crop yields in certain regions, mitigation and adaptation costs, and a loss in biodiversity.

There are still critics who do not believe in the anthropogenic influence of climate change. Although these “denialists” are frequently quoted in the news and tend to spread doubts through media, the overwhelming majority of scientists confirm that human induced GHG emissions are a causal factor of climate change. The IPCC (2007, [online]) mentioned in their report that most of the observed increases in global average temperatures since the mid-20th century is very likely (90%) due to the observed increase in anthropogenic (created by human activity) greenhouse gas concentrations. It is important to record this, as it is the foundation for the debate that there is a need to undertake actions against further anthropogenic emissions.

Climate change is a global problem, which implies an international responsibility to face it. The main difficulty is the “common-good disaster” (described in chapter 2.1) as nobody is willing to undertake single action out of fear of disadvantage in a global context. Nevertheless, GHG concentrations are likely to increase even if emissions are reduced rapidly as the system reacts rather slowly. Therefore, the long-term average temperature will increase. Emission reduction is critical to limit warming in the longer term, but since the Stern report in 2006 and the IPCC report in 2007 it is widely accepted that there is a need to adapt to the upcoming and already occurring impacts.

2.2.1. Tourism and climate change

Tourism is “probably the most visible symbol of both globalisation and pollution” (Mundt 2011, p.111). Tourists tend to cause many emissions to reach their destinations. Ironically, they are destroying the destinations, through travelling, which attract them through a suitable climate and an unharmed nature. Climate change represents a new and considerable challenge to tourism and “demands the attention of, and informed strategic responses from, the tourism industry, government, non-government organisations and researchers within a range of academic disciplines” (Higham & Hall 2005, p. 301).

The relation between tourism and climate change is mutually influential. Tourism is affected by climate change but is also a main contributor to it. The UNEP and UNWTO (2008, p. 132) estimated in their report “Climate Change and Tourism”, that the CO₂-emissions in the year 2005 caused by the global tourism were 4.9% (excluding the energy used for facilities and constructions) of the total emissions released into the atmosphere worldwide. The biggest share of these emissions was caused by the transportation with a 75% share, followed by accommodation with a 21% share of the CO₂ emissions. Another indirect source of emissions contribution by tourism is the land use change and the production of waste, which both generate GHG. An example is the change of land use where deforestation for tourism infrastructure leads to fewer trees in the region to absorb CO₂. Decomposing waste emits methane gas (a twenty times stronger GHG than CO₂). This shows that the tourism sector is heavily contributing to global emissions and therefore, reinforces its anthropogenic share of climate change. The same report made projections of the emissions, caused by tourism, for the year 2035. The “business-as-usual” scenario (further scenarios are described in the next chapter) would lead to a nearly threefold increase of the total emissions of CO₂ (see figure 1, p. 12). The shift of the share of air transportation from 43% to 53% is important as it shows the key factor how to avoid increasing emissions.

Technical innovations or sustainable forms of transportations could be used. Travellers have the ability to influence the tourism system in a significant way with their purchasing behaviour. They can increase the demand for the use of sustainable energies and environmental friendly acting stakeholders. The tourism industry is a service economy and always adapts to the needs of their customers (tourists). Therefore they are likely to change their behaviour and products to attract and satisfy the travellers.

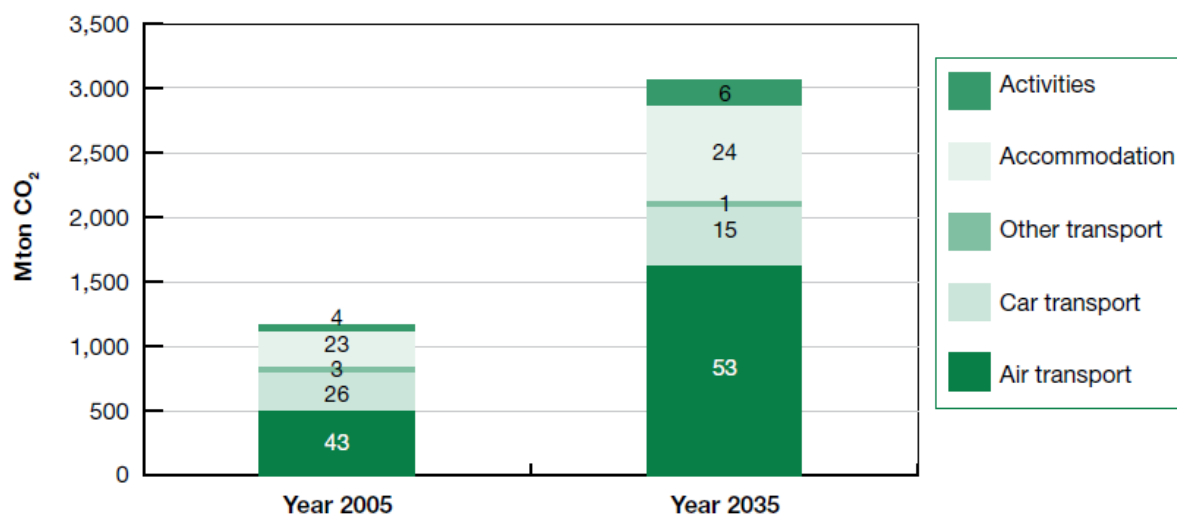


Figure 1: Comparison of current emissions caused by tourist trips (overnight) and projections of emissions for the year 2035 under the assumptions of a ‘business-as-usual’ scenario (Source: UNWTO & UNEP 2008, p. 36).

Tourism is also affected by climate change in other ways. Among the major motivation for tourists to travel are natural and anthropogenic attractions, cultures, and the destinations climate. All these fac-

tors are, either directly or indirectly, influenced by climate change. Most of them are common-goods that make it hard to define responsible authorities to protect these goods. This low sense of responsibility can lead to an increased vulnerability of the common-good towards external influences. Generally it can be said that there is “increasing awareness of the importance of climate change for tourism, but detailed understanding is still limited, as are practical and effective responses” (Becken & Hay 2012, p. 1).

During the discussion about climate change and tourism many experts mentioned the winners and losers of the climate change. These terms refer to the impacts a variety of different regions, countries, and destinations are likely to face. Some national tourism industries are going to benefit from a warmer climate (and other changes) and other countries/destinations will face predominantly negative influential factors. The major climate change impacts and their mainly negative implications on tourism destinations were summarized by the UNWTO and UNEP in 2008 (see table 2, p. 14). These impacts are not localised and cover most of the known primary impacts of climate change. Implications for tourism are not localised either, but demonstrate the wide range of possible implications tourism destinations can face. The UNWTO and UNEP (2008, p. 62) allocated the climate change impacts affecting tourism destinations into four broad categories:

Direct climatic impacts: The climate is the principal resource for tourism, as it co-determines the suitability of destinations for tourist activities. It is the main influential factor of seasonality in tourism and affects the operating costs, such as heating or cooling, food and water supply, and insurance costs. Therefore the climate has a significant influence of the profitability of tourism enterprises.

Indirect environmental change impacts: A wide-range of climate-induced environmental changes will influence the tourism at the regional level. The impacts are going to be in the transformation of the flora and fauna (loss of attractiveness), the change in resource availability (such as water), damages in infrastructure, increase of pandemic diseases, altered agricultural production, and increased natural hazards. These indirect effects are likely to be largely negative; even so some destinations may be favoured by improved climatic conditions.

Impacts of mitigation policies on tourist mobility: International or national mitigation policies (policies which seek to reduce GHG emissions) are likely to impact international and national tourist flows. These policies will lead to an increase in travelling costs. Additionally, they hold the potential to foster environmental attitudes and lead travellers to behavioural changes.

Indirect societal change impacts: Climate change can be a risk to future economic growth and political stability of some nations. For example the transformation of economies that are based on tourism or/and agriculture could be unsuccessful and/or increased migration and urbanisation could lead to serious social tensions.

Despite these mainly negative implications shown in table 2 and categorised above, there are several countries and destinations whose attractiveness will be enhanced through climate change impacts. For example the average temperature in the region can increase and make it pleasant for tourists. Changing patterns of visitor streams are likely to favour some countries with more tourists who decide

against their old main destinations because of unpleasant shifts of the climate or other climate change related factors.

The distribution of the impacts of climate change is spread around the globe. Figure 2 (see p. 15) provides an overview about the impacts different regions in the world are likely to face. Significant is the threat of political instability caused by climate change in many developing countries in Africa, South and East Asia, and the Middle East. This can be caused for example by high adaptation costs, loss of agricultural productivity, increased diseases, decrease of foreign visitors, and/or climate migration. The map, furthermore, visualises that the impacts are unequally distributed and that the relative attractiveness of tourist destinations is going to get modified as a consequence of climate change. These may bring substantial changes in global tourism flows (cf. Becken & Hay 2007, p. 230-231).

Table 2: Major climate change impacts and implications for tourism destinations (Source: UNWTO & UNEP 2008, p. 61.)

Impact	Implications for tourism
Warmer temperatures	Altered seasonality, heat stress for tourists, cooling costs, changes in plant-wildlife-insect populations and distribution, infectious disease ranges
Decreasing snow cover and shrinking glaciers	Lack of snow in winter sport destinations, increased snow-making costs, shorter winter sports seasons, aesthetics of landscape reduced
Increasing frequency and intensity of extreme storms	Risk for tourism facilities, increased insurance costs/loss of insurability, business interruption costs
Reduced precipitation and increased evaporation in some regions	Water shortages, competition over water between tourism and other sectors, desertification, increased wildfires threatening infrastructure and affecting demand
Increased frequency of heavy precipitation in some regions	Flooding damage to historic architectural and cultural assets, damage to tourism infrastructure, altered seasonality
Sea level rise	Coastal erosion, loss of beach area, higher costs to protect and maintain waterfronts
Sea surface temperatures rise	Increased coral bleaching and marine resource and aesthetics degradation in dive and snorkel destinations
Changes in terrestrial and marine biodiversity	Loss of natural attractions and species from destinations, higher risk of diseases in tropical-subtropical countries
More frequent and larger forest fires	Loss of natural attractions; increase of flooding risk; damage to tourism infrastructure
Soil changes (e.g., moisture levels, erosion and acidity)	Loss of archaeological assets and other natural resources, with impacts on destination attractions

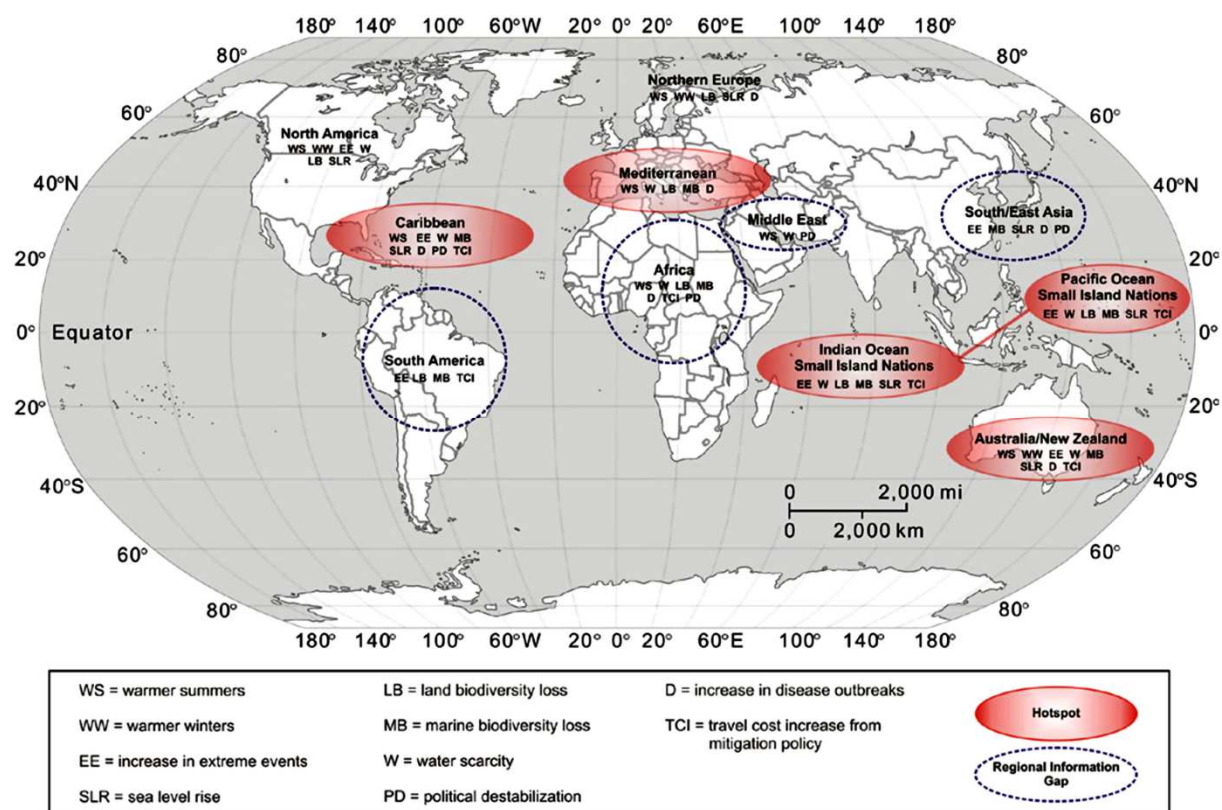


Figure 2: Geographic distribution of major climate change impacts affecting tourism destinations (Key destination vulnerabilities are identified at the sub-regional scale in the full technical report) (Source: UNWTO & UNEP 2008, p. 31)

2.2.2. Concept of mitigation and adaptation of tourism

In order to respond to climate change the tourism system has two main options: mitigation and adaptation. Mitigation of climate change “relates to technological, economic and social changes and substitutions that lead to emission reductions” (IPCC 2007c). Important to notice is that mitigation can be realised through market mechanisms and technological innovation, but that the most important factor to reduce GHG emissions significantly will be the behavioural change (cf. Simpsons et al. 2008, p. 19). Adaptation can be defined as “the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate” (IPCC 2012, p. 5).

Adaptation and mitigation can be undertaken in a complementary manner, independent of each other or substitutable (cf. Rogner et al 2007, p. 101). This means that adaptation towards climate change can include mitigation factors (for example visitor education in destinations about climate change impacts can lead to emission avoidance behaviour). Nevertheless, both components will be needed to cope with climate change comprehensively as the mitigation will be necessary to reduce the long-term impacts and adaptation will be necessary to preserve the competitiveness and attractiveness of a destination. Both mitigation and adaptation processes and strategies can be implemented by individuals, businesses, institutions (such as NGOs and IGOs), communities, and governments. Although

mitigation of climate change is not the focus of this report, it is important to understand and consider the concept of mitigation to create comprehensive adaptation strategies. Combined they can significantly reduce the risks of climate change (cf. IPCC 2012, p. 4). Furthermore, it will be crucial to understand the multiple interactions between tourism and other global or local systems, as interventions designed to reduce climate-related risks can cause unexpected effects in the total system. For example, air travel regulation can lead to serious equity issues, as it will affect global tourism flows (cf. Becken & Hay 2007, p. 301)

Mitigation can include any kind of behaviour or action to reduce natural or anthropogenic emissions. Like in other economic sectors there is a need for the tourism industry to reduce emissions in the upcoming decades. Figure 3 (see p. 16) displays four different scenarios of CO₂ mitigation potential of global tourism until 2035. The worst scenario would be “business-as-usual” with a nearly threefold emissions increase. Potential mitigation scenarios would be either the improvement in technical efficiency (minus 38 percent emissions reduction from business-as-usual scenario) or a change in behaviour in the modal-shift/length-of-stay (minus 44 percent emissions reduction from business-as-usual scenario). Both undertaken together would lead to minus 68 percent emission reduction from the business-as-usual scenario (combined). The latter scenario would generate less CO₂ emissions than global tourism produced in 2005.

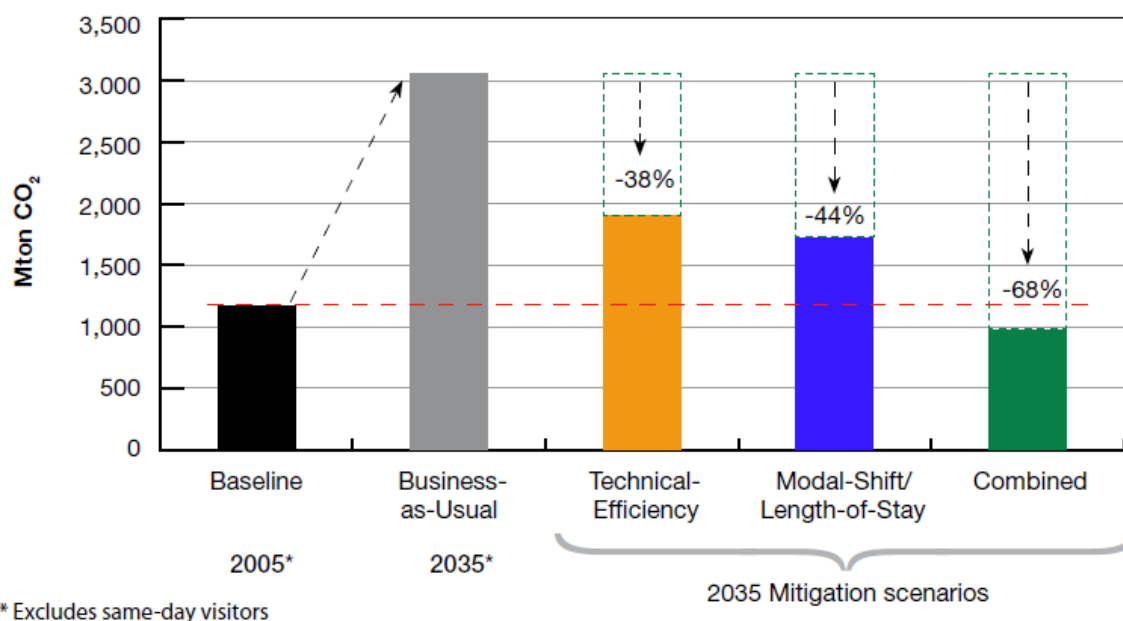


Figure 3: Scenarios of CO₂ mitigation potential from global tourism in 2035 (Source: UNWTO & UNEP 2008, p. 37)

Adaptation can include a variety of actions and behavioural patterns from national and international stakeholders. Possible adaptation strategies will depend on the climate change impacts on the specific tourism destination. For example in the Austrian Alps they include the enhanced use of snow cannons to reduce the negative impacts of a shorter season and less predictable snowfall patterns, whereas

some islands in the South Pacific could build embankments to cope with the SLR and an increasing amount of tropical storms. In keeping up with the topic of this study this chapter will not provide a variety of adaptation possibilities, but they will be examined through the adaptation-indicator catalogue in chapter 4.2.

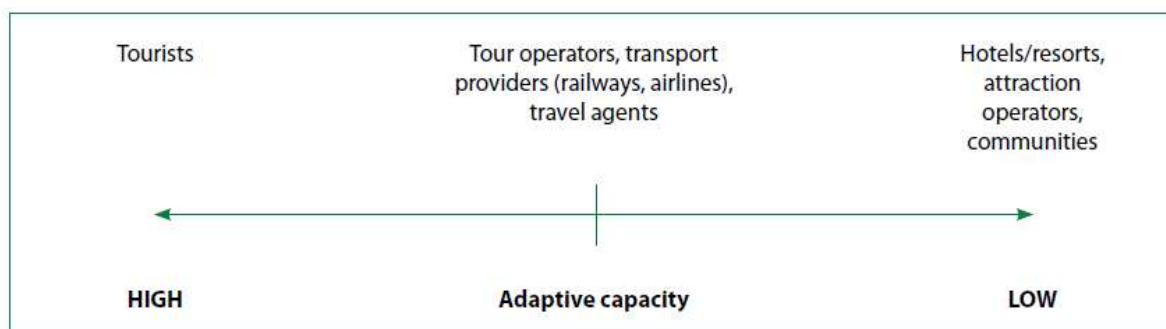
In order to be able to rank the ability to undertake actions of different tourism stakeholders it is important to understand the adaptive capacity. Adaptive capacity is “the ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences” (Brooks et al., 2005, p. 153). Therefore, capacity building is the foundation for the successful implementation of adaptation strategies. According to Alaerts et al. (1991, without page number) capacity building consists of three elements:

- “creation of an enabling environment with appropriate political and legal frameworks;
- institutional development, including community participation;
- human resources development and the strengthening of managerial systems”

The various tourism industry stakeholders have diverse adaptive capacities (see figure 4, p. 18) and interests for climate change adaptation. Tourists (travellers) have the highest adaptive capacity, They are free in choosing their destination and it can be assumed that they are overall not significantly interested to accept higher costs and less comfort caused by climate change. Tour operator and tourism related business have a middle capacity. They are mainly concerned about a sufficient amount of customers which enables them to operate their enterprise. Therefore, it is in their interest to react to changing visitor behaviour and the causal factors of climate change. Nevertheless, there are significant differences regarding the company size, its location, and specialisation. Globally or regional operating enterprises are not bound to one country and it is easier for them to simply change their tours to another destination if the impacts lead to a tremendous decrease in booking numbers.

Smaller tour operator and other tourism related businesses, such as hotels, resorts, and attractions, which are mainly locally bound and specialised to operate in one country are more vulnerable as adaptation to new circumstances are often going hand in hand with high adaptation costs with a low budget. Therefore, they have a lower adaptive capacity. The countries’ government is in a comparable situation, as they do not have the possibility to change regionally. To recover damaged areas or business sectors within the service industry is often leading to tremendous recovery and development costs. The government is the core stakeholder with a big interest to protect the common-good. In a dramatic scenario the tourism related businesses could simply close down their businesses, relocate the enterprise to in another region or sector, and the government is the stakeholder who is left behind with the remaining of the destination.

Other important stakeholders of the tourism system, who are not considered in figure 4, are national and international governments, IGOs, NGOs, and insurance companies. The latter are increasingly important for vulnerable destinations and it can be assumed that they are highly interested to adapt to higher risks, in order to avoid increased costs through e.g. natural catastrophes. The NGO’s (at least those without own property in the effected region) and the insurance companies have a middle adaptive capacity.



Source: Scott, D. and Jones, B. (2006a)

Figure 4: Relative adaptive capacity of major tourism sub-sectors (Source: Scott & Jones 2006, p. 175-248)

A key instrument to adapt to climate change impacts is the disaster risk management (DRM). DRM describes “the processes for designing, implementing, and evaluating strategies, policies, and measures to improve the understanding of disaster risk, foster disaster risk reduction and transfer, and promote continuous improvement in disaster preparedness, response, and recovery practices, with the explicit purpose of increasing human security, well-being, quality of life, resilience, and sustainable development” (IPCC 2012, p. 5). The most effective disaster risk strategies involve several stakeholders working together.

Generally it can be said that “climate adaptation research in the tourism-recreation sector is five to seven years behind that of sectors which are being more proactive” (Becken & Hay 2012, p. 56). Therefore, it is important for all adaptation attempts to consider new findings of adaptation strategies and climate change impacts. It is necessary to readjust the strategies as the future climate and environmental conditions are going to be considerably different (cf. Simpson et al. 2008, p. 30). This permanent adaptation will be especially important for countries that are very likely to face the most impacts, such as many developing countries. Furthermore, it is advisable for national and local governments to legally oblige other tourism stakeholders to participate in adaptation and mitigation strategies. Because, as figure 4 shows, the majority of the stakeholders involved, have a high adaptation capacity which, in an extreme case, can include the possibility to move on to another country as soon as the operation costs rise significantly.

3. Study area Cambodia

The following chapter provides an overview of the tourism sector and current climate situation in Cambodia. It includes the development and economic potential of tourism, the potential impacts the country is likely to face from climate change, and a brief analysis of adaptation strategies in the country.

After a general overview about the country, a description of the framework conditions which provide the foundation to adapt to climate change for the Cambodian tourism sector. The detailed range of Cambodia’s adaptation strategies to climate change impacts is going to be examined in chapter 4.3.

3.1. Tourism in Cambodia

The importance of tourism as a major part of economic revenue has increased in the recent decades. This has led to a national recognition of its potency for further development. The following part of the study illustrates an overview about tourism in Cambodia. In the first part the focus is on a general country overview, an examination of the tourism sector, its development, and its value to the country. Furthermore it will describe how the cultural diversity, the historical architecture and the nature attract people from all over the world. This tourism potential is not yet fully used and the image of Cambodia as a tourism destination is still negatively influenced by the history of civil war and genocide.

3.1.1. Cambodia – overview

Cambodia is geographically located in Southeast Asia. It is bordered by Vietnam in the east, Laos in the north, and Thailand in the northwest. The west of the country has a 435km (cf. World Bank 2011, p. 2) coastline on the Gulf of Thailand. Cambodia covers an area of 181,035 km² (cf. Auswärtiges Amt 2012a, [online]). Within in the country there are two main fresh water resources: the Mekong River and the Tonle Sap. The Mekong River originates in Laos, runs through Cambodia, and flows into to the Mekong Delta in Vietnam where it discharges into the South China Sea. The Tonle Sap in the north-west is an outlet of the Mekong River during the rainy season. Both waters are closely linked to each other.² The waters are often described as the lifeline of the country and are the main source for water for agriculture and fishery. The Tonle Sap supports three million people and provides 60 percent of Cambodians' protein intake through its rich fish stock (cf. National Intelligence Council 2010, p. 20). The topography of Cambodia includes the low-lying central plains of the Mekong, and their surrounding mountainous and highland regions (cf. World Bank 2011, p. 2). Cambodia's tropical climate favours its tourism attractiveness. There are two seasons: a monsoon-driven rainy season, from May until October, and a dry season, from November until April. During the wet season the monthly rainfall can be more than 5,000 mm in some areas. The average temperatures are between 25 and 27°C throughout the year, except from high temperatures between 26 and 40°C in the months before the rainy season starts (cf. World Bank 2011, p. 3).

After years of civil war and genocide a parliamentary democratic system was implemented in Cambodia in 1993. The new constitution was created through the framework of the UN and laid the foundation for its current constitutional monarchy (cf. Auswärtiges Amt 2012a, [online]). Since 1993 the political situation of the country is relatively stable.

Cambodia is still in the process of rebuilding its economic capacity, but despite being among the poorest countries in the world it is experiencing rapid development. The Cambodian economy produced a GDP of 12.7 billion US\$ (estimated by EIU for 2011). Around thirty-eight percent of the GDP are revenue from the service sector (mostly tourism related). The GDP per capita was 801 US\$ in 2010. This places the country into the Least Developed Countries (LDC) in the world. Around 5 million citizens (thirty-five percent of the society) are living under the national poverty line (cf. Auswärtiges Amt 2012b,

² The Tonle Sap quadruples in size during the wet season. The main part of this water comes from the Mekong's monsoon flood. During the dry season the flow-direction reverses and the lake empties into the Mekong. The lake also functions like a tidal basin and prevents the increased monsoon flow from flooding (National Intelligence Council et al. 2010, p. 20).

[online]). Cambodia received about 34,077,544 million US\$ between 2004 and 2010 from international development partners (UNDP 2010, p. 29). Despite improvements of its infrastructure during the recent decade and the high amount of foreign aid, the quality of transport infrastructure remains a serious constraint to growth in different economic sectors (World Bank 2011, [online]).

Other major threats to state capacity and further economic development are the venality of governmental officials, a lack of highly educated people and a low literacy rate, and endemic diseases such as malaria and dengue fever (Brinkley 2011, p. 166, 219, 257). Transparency International (2012, [online]) ranked Cambodia in their Corruption Perceptions Index 2011 on the 164 position out of 182 countries, alongside with the Guinea, Kyrgyzstan and Yemen. This high corruption rate has a negative impact on the countries' development. The literacy rate is just as negative. The UNDP (2012a, [online]) worked out in a survey that the adult literacy rate in 2011 was 77.6%, the same as in the year 2008. The explanation for the low education level can be found in the years of civil war, the consequences of the genocide during the Pol Pot regime (from 1975 until 1979, nearly two million people were killed and almost everyone with an education died, among them eighty percent of teachers in the country) and the decades of low investments into the educational system (cf. Brinkley 2011, p. 4).

3.1.2. Tourism development

Cambodia is increasingly raising interest as a tourist destination among international tourists. The main tourism attractions of the country are their unique heritage of the temple complexes of Angkor and Phnom Penh with its royal palace, national museum and Wat Phnom. Other frequently visited sites are the Killing Fields and Toul Sleng. A majority of tourists are visiting all of these sites once they are in the country. In the recent years Sihanoukville and its surrounding islands have developed to a third big tourist attraction. The shoreline is becoming an alternative to the crowded beaches of Thailand. Other attractions are located among the Mekong, for example the old colonial town Kratie, and in the mountain and highland regions. However, these destinations are only gradually developing for increased visitor numbers. Cambodia has six national parks, but in some of these national parks there are still undiscovered landmines, a legacy of 30 years of civil war, which stops rapid tourism exploitation. These heritage sites in combination with the climate conditions, and national parks form the attractiveness of the country.

Cambodia used to be one of the most famous Southeast Asian tourist destinations in the 1960s, with annual tourist arrivals of 50,000 to 70,000 (cf. Lam, 1996 quote in Chheang 2011, p. 13). The following thirty years destroyed the tourism industry. The conflicts ended in the early 1990s and the country started to re-establish its tourism sector with support from the international community. Since then the tourism industry has developed very fast, especially during the last decade. Nowadays tourism plays an important role in contributing to socio-economic development, job creation, and general poverty alleviation (cf. MoT 2012a, p. 3). The Statistics and Tourism Information Department from the Ministry of Tourism (see table 3, p. 21) shows, that there was a 517.9% growth in tourist arrivals between 2000 until 2011. The total tourist arrivals in 2011 were 2,881,862 visitors. In the same period of time, the revenue from the tourism increased by 728.6%. The revenue were 1,912 million US\$ in 2011. Possible reasons for this explosion of visitor numbers can be the increase of travellers from Northeast Asian

countries with high economic growth or the increased numbers of business travellers looking for investment possibilities. It is likely that both factors had causal effect for this significant growth.

Table 3: International tourist arrivals in Cambodia - overview 1993-2011 (Source: MoT 2012b, p. 2)

Years	Tourist Arrivals		Average Length of Stay (days)	Hotels Occupancy (%)	Tourism Receipts (million US\$)
	number	change (%)			
1993	118,183	-	N/A	N/A	N/A
1994	176,617	49.4%	N/A	N/A	N/A
1995	219,680	24.4%	8.00	37.00	100
1996	260,489	18.6%	7.50	40.00	118
1997	218,843	-16.0%	6.40	30.00	103
1998	286,524	30.9%	5.20	40.00	166
1999	367,743	28.3%	5.50	44.00	190
2000	466,365	26.8%	5.50	45.00	228
2001	604,919	29.7%	5.50	48.00	304
2002	786,524	30.0%	5.80	50.00	379
2003	701,014	-10.9%	5.50	50.00	347
2004	1,055,202	50.5%	6.30	52.00	578
2005	1,421,615	34.7%	6.30	52.00	832
2006	1,700,041	19.6%	6.50	54.79	1,049
2007	2,015,128	18.5%	6.50	54.79	1,400
2008	2,125,465	5.5%	6.65	62.68	1,595
2009	2,161,577	1.7%	6.45	63.57	1,561
2010	2,508,289	16.0%	6.45	65.74	1,786
2011	2,881,862	14.9%	6.50	66.15	1,912

The share of visitors from Asian countries (ASEAN, Southern, and Eastern Asia) in total was 68.6% of the total arrivals in 2011 (cf. MoT 2012b, p. 4). The increase of 39.2% of Chinese visiting between 2010 and 2011 is significant. It is likely that people from China are going to be the major increase in inbound tourist arrival numbers, because of the growth of the Chinese economy. The MoT (2012a, p. 21) itself identifies the Russian and the Arabian market as highly potential as well as Cambodians neighbouring countries. Even so the decrease of travellers from Thailand by 21.7% during the last year was significant in the statistics (cf. MoT 2012b, p. 4). This could be caused by occasional eruptions of violence in the border conflict about the temple of Preah Vihear³. This shows how domestic conflicts can harm the tourism industry. Additionally, to the inbound tourism grew the domestic tourism remarkably, in 2011, by 4% and 7.9 million travellers (cf. MoT 2012a, p. 4).

This significant growth in visitor numbers has lifted the tourism industry into playing a key role in the economy of the country, and it is likely to grow in importance in the future. Therefore, it will be important for the government to ensure good conditions and support the industry through framework policies for sustainable growth.

3.1.3. Tourism as a chance for further development in Cambodia

The MoT (2012a, p. 5) targets in its Strategic Development Plan 2012-2020 to attract approximately 7 million international tourists to visit Cambodia. This significant growth would hold the potential to im-

³ For many years there has been a dispute about the surrounding areas of the temple Preah Vihear in the North of Cambodia. Since the UNESCO listed the temples as a world heritage site in 2008, both countries have stationed troops in that area. At least 16 people were killed and the fights from February to April in 2011 forced thousands of people to flee (cf. BBC 2011, [online]).

prove the development of the country in several ways. The influential factors can be divided into economic, sociological, and ecological components, where many of them are mutually influential.

The economic component is the revenue from the tourism industry, the creation of new infrastructure, and the creation of new working opportunities. The revenue already holds a big share of Cambodia's GDP, but is expected by the MoT (2012a, p. 5) to increase to 5 billion until 2020, in case it would be possible to realise their current strategic growth plan. The demand for tourist infrastructure, such as airports, streets, water supply systems, etc., generates development impulses for sub sectors. In particular the agricultural economy will profit from enhanced infrastructure as many regions currently do not have tar roads or sufficient water supplies. The MoT (2012a, p. 36) expects that around 500.000 new qualified tourism labour force will be needed until 2020, whereas most of the workplaces are employments which demand a low or medium level of education. Therefore, it is suitable to generate alternative work for plenty of people for example the older generations whose education was negatively affected by the wars. Additionally, there are jobs created which demand high levels of education which are likely to suite the current generation who are enrolled in international or Cambodian universities. The MoT (2012a, p. 36) is intending to establish a Tourism Professional Training Institute and to enhance "capacity building for tourism and management of tourism officials and staff working in the tourism sector". One other economic factor can be a multiplier effect of tourism, for example an increasing demand for local agricultural products.

The beneficial sociological component can be the sustaining effects of cultural heritage and traditional rituals, dances, and the way of life. One part of the destination product can be the existing culture. In a country like Cambodia, with an extensive cultural heritage, tourist do expect to see some cultural traditions and are willing to pay extra to see shows with cultural elements. The continued practice of rituals can increase the awareness of the population of its own cultural roots and generate a national pride. Another impact can be the cultural exchange between foreign visitors and the locals, this creates awareness among the locals of other ways of living and different worldviews.

The ecological component includes the preservation of nature and increased protection of remaining natural resources. The MoT (2012a, p. 3) considers the tourism as the "Green Gold" and encourages the growth of the ecotourism sector. They are aware that the natural beauty of a country is one of the most important selling propositions to attract foreign tourists.

Generally it can be said that tourism has the potential to lift people out of poverty and that the recognition of tourism as a poverty alleviation has made it an important component of the international development agenda (cf. Hall & Coles 2008, p. 1-26). The effect of poverty reduction and development created by tourism are a big chance for Cambodia to improve their living standards and develop in all three, above mentioned, components of sustainable development.

3.1.4. Threats for tourism growth

The threats for a future growth of the tourism sector in Cambodia can be classified as internal and external negative influences. (This is a short summary of possible threats; all threats which are linked to climate change will be explained in more detail in chapter 4.1).

The internal threats are increasing extreme weather events and a negative shift of seasons. Another possible threat can be increasing crime rates that affect tourists. There were violent and non-violent robberies in Phnom Penh, Siem Reap, and Sihanoukville against tourist, as well as increasing theft of bags from Tuk-Tuk taxis (Auswärtiges Amt 2012c, [online]). Also general political instability and border disputes or other military conflicts are likely to have negative impacts on tourism. They can generate travel warnings from foreign countries which are published and advise their citizens to not visit parts of a country or the country as a whole. Another internal threat is the uncontrolled growth of tourist destinations. In many parts of the country huge hotel complexes are getting built without a current regional development plan that should be based on the newest scientific findings. The last argument is based on anecdotal evidence.

The actual travel warnings, which were mentioned above, or international policies and regulations can be classified into external threats. These policies and regulation can for example be tax increases in aviation, which can cause shifts of tourism behaviour and destination choices. It is likely that this would lead to fewer visitors from Europe and the USA, but would not affect visitor behaviour from Northeast Asia.

3.2. Climate change in Cambodia

The effects of climate change are not new for Cambodia. A recent study suggested that the collapse of the great Angkor Empire was partly caused by shifts in climate patterns (cf. MoE & UNDP 2011, p. 2). Over the last decades Cambodia has also regularly experienced several natural disasters such as droughts, floods, storms and some degree of SLR. Therefore, climate change is unlikely to create new natural disasters, but the disasters already experienced are likely to occur more intensively and more frequently (cf. MoE & UNDP 2011, p. 64). Nevertheless, today's Cambodia will need to find new ways to adapt to the challenges.

The following part of the study illustrates an overview about climate change in Cambodia. In the first part the focus is on a general overview about national changing climate conditions and how people experience it, and the relation between climate change and tourism. Afterwards the focus is on the impacts on Cambodia and general adaptation strategies of the tourism sector.

3.2.1. Climate change in Cambodia – overview

There has been a significant discussion about Climate change in Cambodia. The country is one of the poorest countries in the world and is likely to face main impacts. The current situation of Cambodia as a developing country provides the opportunity to avoid mistakes many Western states have made and to include sustainability concepts in their development strategies. Dr. Mok Mareth from the Ministry of Environment stated at the Second National Forum on Climate Change in Cambodia that “addressing climate change makes sense, politically, economically, environmentally and technologically. We believe we can turn the climate change crisis into a new opportunity for a more sustainable development. We must switch our development path into a greener, low carbon and more climate resilient mode” (cf. MoE 2012, [online]).

The World Bank (2012c, [online]) considers Cambodia to be one of the more disaster-prone countries in Southeast Asia. Different international and national institutions expect dramatic changes in the climate and predict a wide range of impacts (These predictions are explained in detail in chapter 4.1). It is estimated that Cambodia's temperature increases will be 0.7-2.7°C by the 2060s and by 1.4-4.3°C by the 2090s (World Bank 2012a, [online]). Within Cambodia, there are regional differences in temperature increase expected. The UNDP mentions in one report that regions with a low altitude such as central Cambodia and the northwest are expected to have high increasing rates (0.036°C per year). In high-altitude areas such as the southwest the rate is expected to be lower (0.013°C per year); (cf. MoE & UNDP 2011, p. 18). Another study examined higher increases during the measurement period between 1960 until 2003. The annual temperatures increased by 0.8°C during this time (0.18°C per decade). There were seasonal differences. During the drier season the temperatures increased by 0.20-0.23°C per decade. During the wet season it increased by 0.13-0.16°C per decade. The same study showed that the number of 'hot' days and 'hot' nights⁴ has increased significantly (cf. World Bank 2011, p. 4).

The MoE and BBC World Service Trust's Research and Learning Group (2011, p. ix-xi) has conducted, on the behalf of the Cambodian Ministry of Environment, research in all 24 provinces and interviewed 2401 Cambodians in a representative survey and 101 key informants from industry, media, national and provincial governments, NGOs, etc. to explore public perceptions of climate change. The key findings of this study were (chosen by relevance):

- All key informants have observed weather changes during their lifetime. These include hotter temperature, diminished rainfall, less predictable seasons, more storms, more frequent thunder and lightning, and more frequent and severe flooding.
- A quarter of the respondents did not know how to respond to the changing weather. The most significant barriers were a lack of tools, lack of money, and a lack of information.
- Little attention to climate change is given by the Cambodian media.
- A current lack of awareness among the public suggests they do not know of existing local and national programmes to respond to climate change. The key informants say that those best placed to inform their communities about impacts are not as well informed as those in national government.
- Many Cambodians are making adaptation decisions without support or information from any source outside their immediate communities.

The Economy and Environment Program for Southeast Asia (EPPSA) has developed different maps of Southeast Asia with a focus on impacts, vulnerability, and adaptation capacity. Cambodia is ranked as one of the most vulnerable countries in the region (See figure 5, p. 25). The prediction was made on the basis of population density, the space of protected areas, the hazard predictions for the region, and the adaptation capacity of the country. The reason for the high vulnerability of Cambodia is a

⁴ Hot days or nights are taking place when temperatures are above "10% of days or nights [that] are recorded in current climate of that region and season" (World Bank 2011, p. 4).

product of its political, social, and economic circumstances: “levels of poverty; the importance of highly seasonal natural cycles of hydrology and rainfall for agriculture and economic development; the capacity of State; legal and market institutions; and the high dependency on foreign aid” (MoE & UNDP 2011, p. 5). Another point is that the livelihood of the majority of people directly depends on natural resources (80% of the population lives in the countryside). The extreme poverty and the limited access to water and food increase the vulnerability (cf. Oxfam Cambodia & Kyoto University 2008, p. 9). The government itself recognises floods and droughts as one of the main drivers of poverty (cf. World Bank 2011, p. 6).

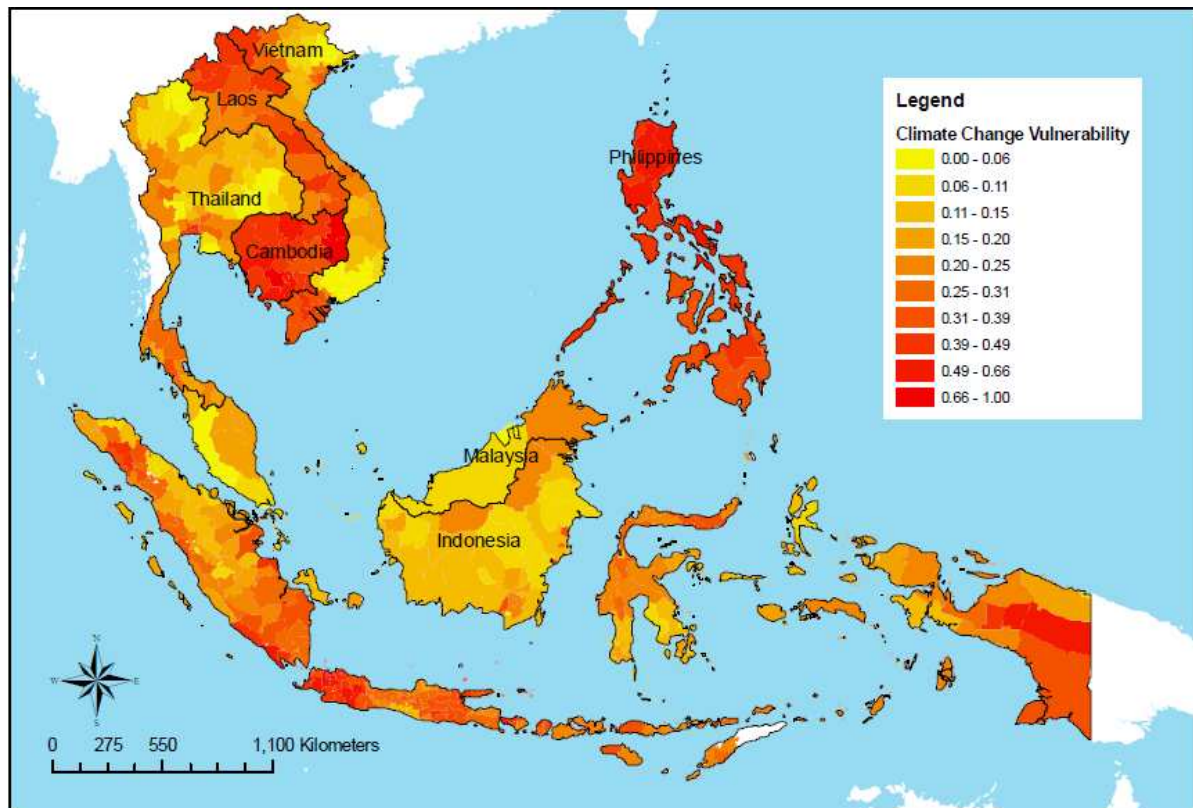


Figure 5: Climate change vulnerability map of Southeast Asia (0 is least, 1 most vulnerable) (Source: Yusuf & Francisco 2009, p. 11)

The report of the EEPSEA also shows that the adaptive capacity of Cambodia is the lowest in the whole region (see figure 6, p. 26). The assessment was based on the variables HDI, poverty incidence, income inequality, electricity coverage, extent of irrigation, road density, and communication systems. The low ranking and the variables used provide an overview of fields in which Cambodia will need to improve to cope with climate change effectively.

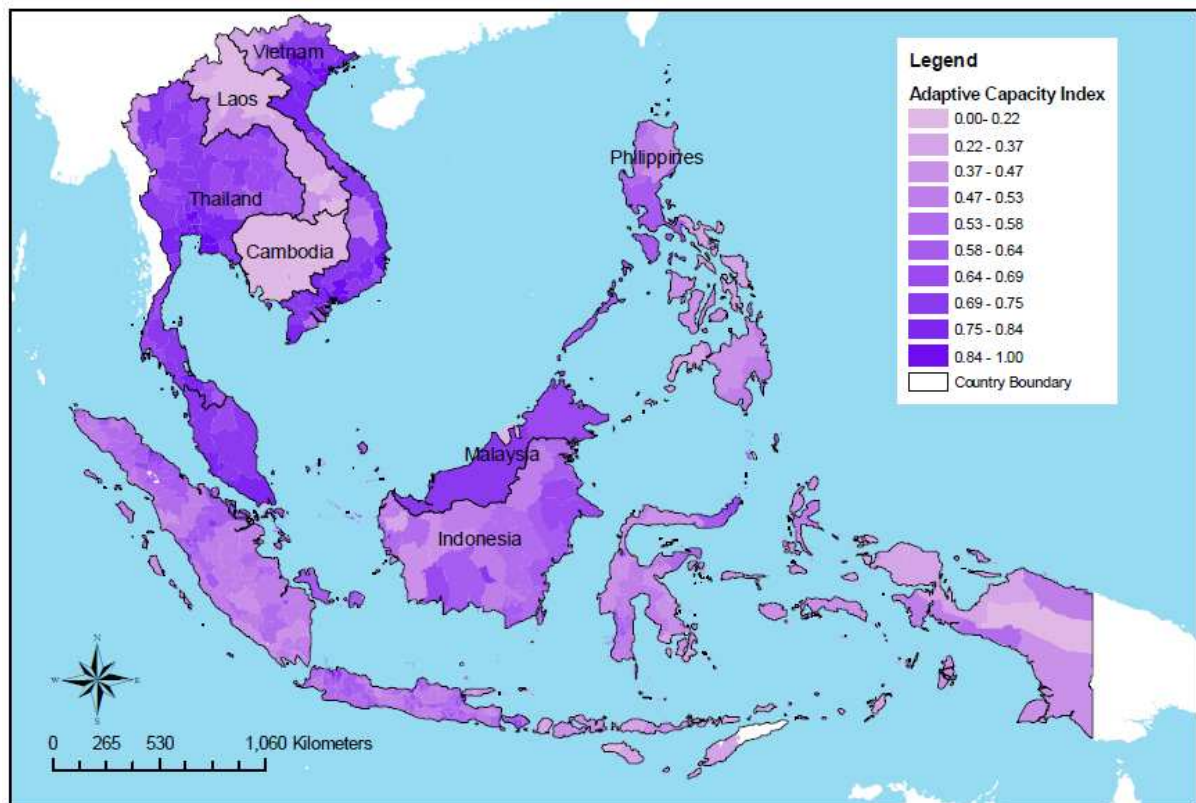


Figure 6: Adaptive capacity map of Southeast Asia (2005) (0 is least, 1 most capacity) (Source: Yusuf & Francisco 2009, p. 10).

3.2.2. Tourism and climate change in Cambodia

There are currently no studies examining the link between tourism and climate change in Cambodia. Neither are there investigations of the mitigation or adaptation possibilities of Cambodia's tourism sector. This study will provide an overview about the topic and the next chapters provide an insight of how the tourism industry will be affected and what adaptation possibilities it has.

The chapter 2.2.1 already discussed the general relation between tourism and climate change. Therefore, this information will not be repeated in this chapter. Nevertheless, it is important to consider country specific approaches. The tourism industry in Cambodia has been booming during the recent decade and is likely to grow further. However, it is essential for growth that the sector adapts to climate change and reduces its environmental footprint to ensure that it remains an attractive tourism destination.

3.2.3. Adaptation of tourism

The Cambodian tourism sector will need to take action to cope with this reinforced natural phenomena and new impacts (the comprehensive analysis of estimated impacts is in chapter 4.1) caused by climate change. Tourism demand is very sensitive to changes in climate and its consequences. The challenge will be to minimise those factors that can lead to negative impacts on the competitive advantage of Cambodia as a tourist destination while maximising factors that increase this advantage (cf.

Becken & Hay 2007, p. 233). Cambodia is still in a process of rapid development which allows for the tourism industry to consider impacts during the planning and construction of tourism infrastructure. These adaptations should include mitigation approaches to reduce a further increase of emissions that would reinforce the impacts in the long-term.

It will be important to create a comprehensive approach to adapt to the impacts, as the causalities that determine the strengths of consequences of natural phenomena often do not reside in the tourism industry. Becken and Hay (2007, p. 228) described that “the open nature of the tourism system” is leading to a “need for multisector and multiagency cooperation when addressing the consequences of climate change”. Therefore, adaptation initiatives should “consists of the institutions, policies, plans and legislation, knowledge and skills, decision support tools and methods, financing and technologies” (Becken & Hay 2012, p. 33-34). Furthermore, Cambodia should initiate meetings and conferences regarding the adaptation of the tourism sector on frequent bases.

More adaptation strategies and concrete actions for different stakeholders will be discussed in detail in chapter 4.2.

Another factor which is often used as an excuse for inactivity is the uncertainty of the impacts. Generally it can be said that Cambodia will face impacts and stakeholders should keep in mind that many decisions in politics and business are often based on uncertainty. The decision for adaptation strategies should be approached in a similar manner as the consequences of inactivity could lead to significantly more cost than pre-disaster adaptation.

4. Results

The following chapters show the results of this study including a list of the possible climate change impacts on the tourism, the adaptation-indicator catalogue for assessing adaptation strategies from the tourism sector, and, based on this catalogue, the analysis and interpretation of the in-depth interviews and the literature analysis. The latter provides the results of the investigation about the current state of adaptation of the tourism sector in Cambodia to climate change. The catalogue gives a description of the used indicators and lists adaptation options for the tourism in Cambodia.

4.1. Climate change impacts on the tourism in Cambodia

This chapter show the impacts of climate change on tourism in Cambodia, categorised according to the classification of climate change impacts on tourism by the UNWTO and UNEP (see chapter 2.2.1). There are no studies on the impacts of climate change on tourism in Cambodia. Therefore, the following part is based on general studies about climate change impacts in Cambodia and this is transferred to the particularities of the tourism sector.

The following impacts are based on reports and different studies. Nevertheless, there are some impacts that are not yet scientifically confirmed. Another fact that needs to be considered is that these impacts vary regionally in their strength and that there is a need for more detailed studies to investigate regional specific impacts. Nevertheless, the following chapter provides a good overview of the

impacts Cambodia is likely to face. The timeframe in which the impacts are likely to occur cannot be specified in this study as this study intends to provide a broad overview.

4.1.1. Direct climate impacts

Seasonal changes: The Cambodian Ministry of Environment and UNEP (2011, p. 51) summarizes in a report that the changing climate will increase the hot days during the dry season and extend the dry season, while the wet season will start a few weeks later and will be shorter. These changing seasons will decrease the timeframe where Cambodia as a tourist destination can be considered to be climatically pleasant for tourists.

Changes in operation costs: It is very likely that the general operating costs for tourism industry stakeholders will increase in Cambodia. The two major causes will be the extended period of time when tourism facilities will need to be cooled down and insurance prices which are likely to increase, especially in flooding areas or affected coastal regions. Other causes include increased transportation costs during floods, higher food prices after droughts, less income due to an increased number of last minute cancellations, and particular infrastructure costs against rising sea level, for example.

4.1.2. Indirect environmental change impacts

Rainfall patterns: The rainfall in Cambodia, mainly caused by the monsoon, has developed in two different ways. On the one hand the heavy rainfall events increase, while on the other hand the overall monsoon flow weakens (cf. NCDM 2002, without page number). However, there is still a degree of uncertainty in the estimations of the World Bank (2011, p. 4) report, where it says that the general rainfall trends are unclear (regionally diverse whereas some experience increases other decreases) and that the changes are not statistically significant. Nevertheless, it will be very important not to underestimate this threat as increased heavy rainfalls can cause floods and landslides, and affect the tourism in various ways. First, main tourism centres, such as Siem Reap in 2011, can be flooded which affects the visitors. During the flood in autumn 2011 nearly 200 tourists had to be rescued by three helicopters from the ancient temple complex Banteay Srei, after flash floods had cut off the access road (cf. Fox News 2011, [online]). Furthermore, other tourism infrastructure and accommodations can be affected and could lead to supply shortages and inconveniences for tourists. Lastly, the floods can affect the groundwater which could lead to increased health risks.

Human health: Estimations are that the climatic changes will have significant influence on the outbreak of diseases. Reasons for this are an increase in average temperature and floods that favour the spread of malaria, dengue fever, and other vector-borne diseases. Additionally, the MoE and UNDP (2011, p. 65-67) predict that the infection with water- and food-borne diseases, such as diarrhoea and cholera will increase. Cambodia has already suffered under the highest malaria fatality rate within Southeast Asia (cf. MoH, 2004, without page number). These diseases can easily affect travellers in the country or even create a negative image of Cambodia as a tourism destination through foreign media publications.

Droughts: Predicted is an extension of the dry season which will include a higher number of 'hot days' and lead to an increased appearance of droughts within the country (cf. MoE & UNEP 2011, p. 51). The most severe drought during the last decades occurred in 2002. It destroyed more than 100,000 ha of paddy fields and affected more than 2 million people (cf. Cambodia Development Research Institute 2002, without page number). The constant higher temperature can affect daytrips and shorten the pleasure of outdoor activities, especially activities such as mountain biking or trekking. Alternative indoor activities or daytrips should be available for tourists. Another hazard can occur by increased risks of forest fires. Fires can be a hazard for tourism infrastructure and lead to closures of national parks and other regions for tourists.

Water shortages: Cambodia is a country with annually more than enough water to cover their average water supply (Estimates suggest groundwater resources of around 17,600 million cubic meters, 100 times more than the country is currently using). The main water resources come from the Mekong River and the Tonle Sap Lake. Unfortunately, the seasonal variations of droughts and floods in combination with a weak water infrastructure have led to some regional water shortages during the dry season (cf. MoE & UNDP 2011, p. 43). It is important to mention another geopolitical factor at this stage that can influence the water situation, but is not caused by climate change. The CENTRA Technology enterprise, which provides security, analytic, technical, engineering, and management support to private sectors and governments, released a report for the US National Intelligence Council in which they describe the planned hydropower dams in China, Laos, and Cambodia upstream on the Mekong as a bigger threat to Cambodia's water supply than the climate change impacts. These dams would increase the climate change impacts and could lead to a stop of the seasonal reversal flow into the Tonle Sap. The lake would shrink dramatically and have a significant negative impact of Cambodia's agriculture (cf. National Intelligence Council 2010, p. 20). All these factors can increase the water stress, already existing during the dry season in some regions. These would have effects on the tourism industry as the water prices are rising, the water quality is likely to get worse. Quite apart from the influences water stress is causing among the local society.

Agriculture: The agriculture of Cambodia is likely to be affected by different causes. The increase in temperature will affect the annual yield of crops, especially rice (cf. MoE & UNDP 2011, p. 53). Another causal factor is the increase in extreme weather events such as droughts (cf. National Intelligence Council 2010, p. 13) or floods. This can cause a general shift in growing areas and affect the traditional agricultural communities that have settled at one location and grown the same crops over a long period of time. They will face difficulties to adapt to new circumstances (cf. National Intelligence Council 2010, p. 13). The tourism sector is going to be mainly affected through higher food prices and on the long run a loss of traditional communities, who currently host tourists in home stays once in a while.

Coastal erosion and salinization: The sea level is expected to rise at a rate of 1.7cm per year under a "high GHG" emission scenario (regarding to IPCC projections of 2007). This pace would lead to a permanent inundation of around 25,000 ha of coastal zone within 90 years and an expected 1m for this time period (cf. MoE & UNDP 2011, p. 19). The impacts could pose a significant threat to low-lying tourism infrastructure such as beach resorts, hotels, restaurants, and seaports. Additionally, the

coastal mangrove forests and the marine life are in danger (cf. World Bank 2011, p. 6). Another impact will be an increased salinization of the coastal groundwater reserves that are used to provide fresh water to accommodation and tourism facilities (cf. MoE & UNDP 2011, p. 19).

Ecosystems and biodiversity: Cambodia is part of the Indo-Burma biodiversity hotspot and is rich in diversity in flora and fauna (cf. Myers *et al.* 2000, p. 403). Currently twenty-four percent of the country's total land area is protected through ten protected forests and twenty-seven protected areas (cf. Kapos *et al.* 2010, p. 5). Forest cover loss is a major challenge for the biodiversity in Cambodia. The country has lost approximately 3 735 km² of forest, between 2002 and 2006. This reduced the country's total forest cover from 61% to 59% of land mass (cf. Kapos *et al.* 2010, p. 11). Climate change is likely to reinforce the forest cover loss through longer dry seasons and general temperature patterns. The most vulnerable regions will be the low-lying areas, wetlands, and coastal regions, because these regions will suffer from water shortages, salinization, erosion, SLR, and floods. These influences will affect the fauna and decrease its diversity.

Decline of landscape aesthetic: Climate change is likely to have a negative impact on the scenic nature of Cambodia due to longer dry seasons, loss of biodiversity on- and offshore, and increased temperatures. International tourists which are expecting a tropical country and green rice paddies can be upset by the dry landscape. The decrease in biodiversity will negatively influence the attractiveness of Cambodia and can especially harm future growth, because most of the current tourists are focussed on the temples of Angkor, the potential of the rich biological diversity of the country as a tourist site is not yet fully used. In particular, growing markets such as bird watching, jungle trekking, or canoe tours will be negatively affected by a loss of Cambodia's landscape aesthetic.

Damage on infrastructure: Increased annual floods and droughts are causing significant damage on the general national and tourism infrastructure of the country. During the last twenty years floods have caused millions of USD damage in the country in water supply systems, energy lines, and tar roads. The tourism industry cannot function without a secure supply of basics, such as energy, water, and a functioning waste system. Another big issue is the quality of the roads. Without proper roads the tourists cannot reach attractions or it will take them a long time. This is a critical factor as the average length of stay of each visitor is under one week. This, furthermore, can increase the tourism numbers in main destinations and will not diversify national tourism flows which would be necessary to use the whole tourism potential of the country.

4.1.3. Impacts of mitigation policies on tourist mobility

Incoming tourism in Cambodia is likely to be affected by international mitigation policies passed in foreign countries. In particular policies regarding aviation will be important. These policies include travel restrictions, mandatory emission standards, tax incentives to induce airlines to reduce emissions, air traffic control and airport reforms, airport emission charges, controls on airport development, aviation fuel and carbon taxes, and the emission trading schemes⁵ (ETS) (Forsyth 2008, p. 7-9). The latter is probably the most influential mitigation policy affecting Cambodia as Europe implemented ETS

⁵ Emission trading schemes do cap the total amount of emissions approved to be caused by aviation for a limited time and regulate the trading of these emissions between the stakeholders (cf. Forsyth 2008, p. 9).

between its member countries as well as internationally in 2012, New Zealand domestically in 2009, Australia domestically in 2010, some US states have implemented them already, and several other countries have also done it or planning to do so, such as China (cf. Australian Government 2012, [online]). It will be important to observe the developments in China as they are potentially one major new source of visitors for Cambodia.

The ETS leads to extra costs for the airlines. To which extent the additional costs will depend on how much of them can be transferred to customers, but due to the competitiveness in the sector these costs are not likely to explode rapidly (cf. Heyman & Härtel 2011, p. 1). These systems may affect traffic flows, therefore it is advisable to observe incoming visitor numbers by country and adapt marketing strategies based on this observation.

4.1.4. Indirect societal change impacts

Development: The impacts of climate change can harm the development process in Cambodia in several ways. The increased appearance of droughts, epidemic diseases, and floods can lead to a growing income gap between the most affected rural population in comparison to the population in the cities with a functioning infrastructure and medical supply systems. Another factor can be the negative effect of disasters on the literacy rate in the countryside as children probably will need to help their families back home more often and will not attend schools. It is also likely that shorter growing seasons and more droughts will increase the already existing malnutrition. This would in particular affect the children who can suffer from irreversible consequences. It can be said that all these factors negatively affect the ability of the tourism sector to grow.

Economic growth: Cambodia's economy can be negatively affected by the variety of direct and indirect impacts caused by climate change. The major affect will be caused by the adaptation costs. These costs include disaster risk management implementation, supply for affected people, rebuilding of damaged infrastructure, and building projects in regions prone to SLR or floods. Another significantly harming factor will be the decreased agricultural productivity and the affected tourism development. Other economic sectors as the manufacturing sector can be negatively influenced as well. All this can lead to a general deceleration of the growth.

Migration: The tourism sector should be aware of the geopolitical factors climate change can cause. The report prepared for the US National Intelligence council (2010, p. 17) says that Vietnams Mekong Delta will lose over 14,000 square miles due to SLR by 2030. The Mekong Delta is densely populated and millions of Vietnamese would move north into Ho Chi Minh City, to the Central Highlands, and over the Cambodian border (cf. National Intelligence Council 2010, p. 29). The migrants will most likely move into the sparsely populated regions north-east or to the densely populated areas in south-eastern Cambodia. This migration could lead to conflicts as it brings culturally antagonistic groups into close contact with each other (cf. National Intelligence Council 2010, p. 48). These possible conflicts could lead to travel warnings and thus cancellations. These population movements can also occur domestically from disaster prone regions into the bigger cities.

Food security: Increased floods and droughts will intensify the already existing regional food stress in the country. This is likely to lead to a chronic dependency on humanitarian food aid, as Cambodia lacks the monetary resources to purchase substantial amounts of food overseas (cf. National Intelligence Council 2010, p. 15). Here visitors themselves are not likely to be affected. Food security problems may raise the prices generally, but the tour operators and accommodations do have the funds to adapt to these changes through revenue. Another problem could result in a general rise of crime rates. The chance that desperate people are more likely to risk punishment getting caught doing crimes can increase.

Increased crime rate: There are different already noted impacts that can cause increased crime rates within Cambodia. These are increased migration rates and regional conflicts, progressive impoverishment, and undernourishment that lead to acts of desperation. Tourists are a likely target for robberies as they are living on a different living prosperity standard.

Social-political instability: The combination of many/all above listed climate change impacts and other environmental, political, social, and economic influences can lead to social and/or political instability. This can lead to partial or complete state failure. Any of these instabilities would have a significant influence on the tourism sector and is likely to lead to, depending on strength, a decrease or absence of visitors in Cambodia.

4.2. Adaptation-indicator catalogue

This chapter is about the adaptation-indicator catalogue which has been developed based on the findings in chapters 2, 3, and 4.1.

The adaptation-indicator catalogue is divided into three different and yet interacting dimensions: the governmental, the tourism industry, and the co-operational and communicational dimension (see figure 7, p. 33). The governmental and the tourism industry dimensions include all conceptual and actual adaptation actions considered on different levels. The catalogue includes a column that indicates which stakeholders are involved in different aspects. These stakeholders include IGOs and NGOs. They do not have a specific dimension as their work is mainly project-based and their projects can be categorised into one of the three dimensions. For example, a project that involves consulting the government with drafting new laws regarding building regulations in coastal areas is categorised in the governmental dimension. A community-based ecotourism project in a national park initiated and funded by a NGO can be categorised in the tourism industry dimension as they are partly acting as a destination manager.

Each of the three dimensions is further structured: the governmental and tourism industry dimensions are divided into three different sub-sections and further indicators, and the co-operational and communicational dimension directly into indicators. An indicator is defined by Babbie (2010, p. 131) as “an observation that we choose to consider as a reflection of a variable we wish to study”. The different indicators and sub-sections are ordered from the international and national down to the local levels, as is shown in Figure 7. The international level can include international marketing campaigns or global strategies of big tourism stakeholders under the tourism industry dimension while the policies

are at the international level of the governmental dimension. Program and project implementation occurs in both dimensions at the local level. The different indicators of the catalogue were inspired by the UNWTO and UNEP (2008, p. 82) report about climate change and tourism, and the SEI report “Mainstreaming climate change adaptation into development planning (Lebel, et al. 2012, p. 8).

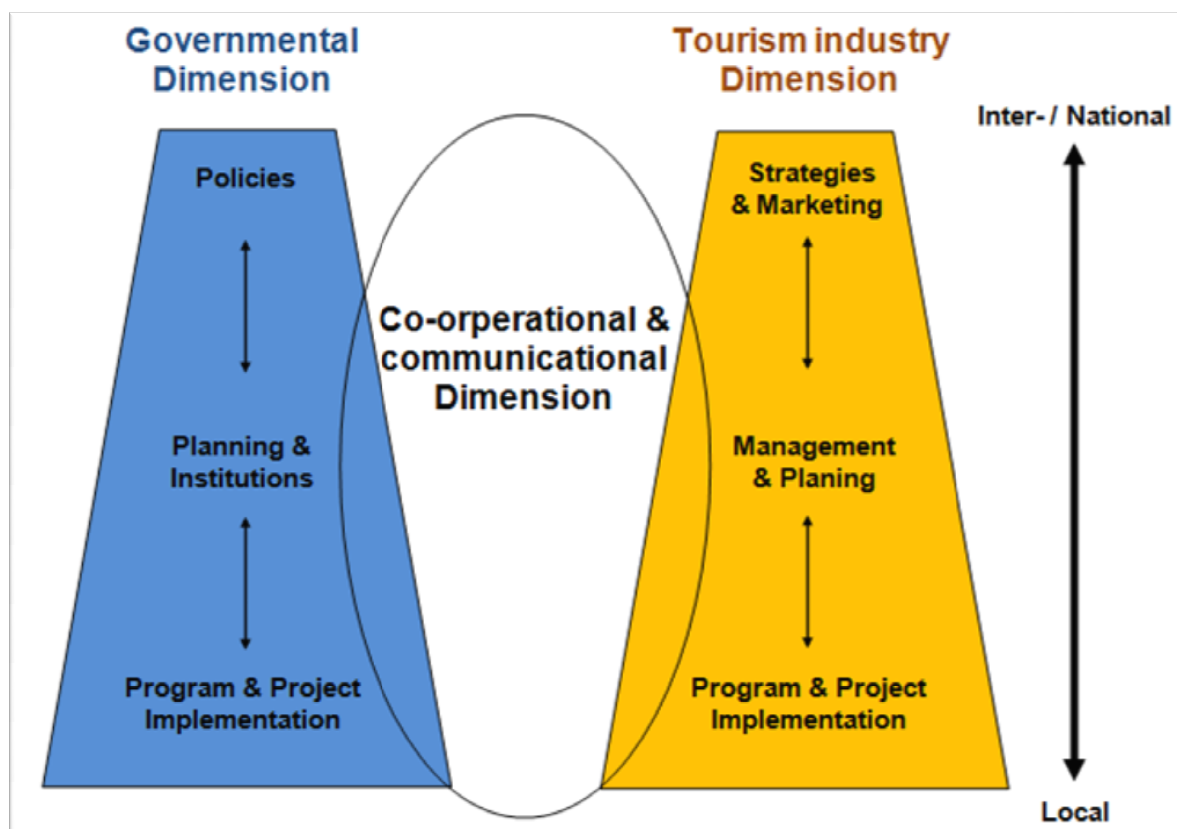


Figure 7: Framework for adaptation indicators of the tourism sector on a national level

The catalogue shows the three dimensions in which adaptation strategies of the tourism sector take place (see table 4, p. 34). The different indicators of each dimension are going to be used to assess the current state of adaptation strategies in Cambodia. Important to mention is that the dimensions do not necessarily solely involve the stakeholders who are related to the names. In addition, the row ‘Stakeholders’ provide information about which indicator is most likely linked to which stakeholder. Nevertheless, the link is not settled, as for example IGOs and NGOs can be consultants in fields such as policymaking (in the governmental dimension) or water management (in the tourism dimension) and is active in the co-operational and communication dimension.

The catalogue and the following descriptions of each indicator can be seen as a list of adaptation options for stakeholders from a national perspective. Generally, it can be said that the more indicators are achieved regarding climate change adaptation; the better is the adaptation capacity. However, this study intends to cover the whole tourism sector in Cambodia and cannot provide a comprehensive list of adaptation options for each stakeholder. Neither can it provide information about region specific adaptation possibilities. Further studies will be necessary to provide the tourism sector with more detailed advice. Nevertheless, this investigation endeavours to provide a comprehensive insight.

Table 4: Adaptation indicator catalogue for assessing adaptation strategies of the tourism sector on a national level (Abbreviations: GOV = government; TO = tour operator; ACC = accommodation supplier; SER = service supplier; INS = insurance company)

Nr.	Dimension/ Indicator	Stakeholders
A	Governmental dimension	
1	<u>Policies</u>	
1.1	Adaptation policies	GOV
1.2	Building regulations	GOV
1.3	Business subsidies	GOV
1.4	Regulation for insurance companies	GOV
2	<u>Planning and Institutions</u>	
2.1	Institutions or workgroups	GOV
2.2	Development planning	GOV, IGO, NGO
2.3	Disaster risk management	GOV, IGO, NGO
2.4	Overall sector co-ordination	GOV
2.5	Conservation of natural ecosystems	GOV, IGO, NGO
2.6	Research strategies and institutions	GOV, IGO, NGO
2.7	Country marketing adapted to impacts	GOV
2.8	Funding mechanisms	GOV, IGO
3	<u>Program and project implementation</u>	
3.1	Construction projects	GOV, NGO, IGO
3.2	Monitoring and evaluation programs	GOV, NGO, IGO
3.3	Education program	GOV, IGO, NGO
B	Tourism industry dimension	
1	<u>Strategies and marketing</u>	
1.1	Product diversification	TO, ACC, SER
1.2	Low season closures	TO, ACC, SER
1.3	Marketing modification	TO, ACC, SER
1.4	Tourism networks and co-operation	TO, ACC, SER
1.5	Insurance – cover and product modification	INS
2	<u>Management</u>	
2.1	Crisis management	TO, ACC, SER
2.2	Waste management	TO, ACC, SER
2.3	Water management	TO, ACC, SER
3	<u>Program and project implementation</u>	
3.1	Construction projects	TO, ACC, SER
3.2	Educational programs for tourists and staff	TO, ACC, SER, IGO, NGO
C	Co-operational and communicational dimension	
1	Disaster risk management co-ordination	GOV, IGO, NGO
2	Cost sharing	GOV, TO, ACC
3	Conferences and meetings	GOV, IGO, NGO, TO, ACC, SER, INS

4.2.1. Governmental Dimension

The following chapter is focused on the governmental dimension and includes a list of adaptation options, which can be considered to be in the area of responsibility of different governmental institutions in Cambodia. The options could however also be undertaken by IGOs or NGOs or other stakeholders supporting the adaptation strategies in Cambodia. In order to deal with climate change effectively it will

be important to apply both policy and practical responses to increase the adaptive capacity of the government (cf. Becken & Hay 2012, p. 4).

A 1 Policies

Comprehensive adaptation strategies include policies as a framework and are the strongest regulating factor on the domestic tourism sector. Adapting to a phenomenon as complex as climate change involves stakeholders from a wide range of disciplines, who are often working in their own interest. It is therefore necessary to regulate different sectors and to ensure that interest of the common good in the country such as the nature and the climate is integrated, while also respecting and considering interests of individual stakeholders.

A 1.1 Adaptation policies

The adaptation policies of a country include all policies and regulations (this excludes special regulations which are described in the following three parts), which were, consciously or unconsciously, designed to adapt to changing climatic patterns. It is to assume that there is a need for a legal framework and strong regulations to enforce them in Cambodia.

A 1.2 Building regulations

Building regulations should be considered to adapt the booming tourism sector in order to avoid negative consequences, such as serious harm to the infrastructure by increasing flood patterns in the long term. Another example would be a regulation at coastlines where SLR is expected to affect destinations or settlements. This regulation could include the distance between new tourism facilities and the waterfront.

A 1.3 Business subsidies

Subsidies are an option to reward tourism businesses or adaptation related initiatives or behaviour. This can include mitigation of emissions, educational programs for staff and tourists about climate change issues to raise awareness or to subsidise water use efficiency and treatment projects to reduce the total amount of used groundwater as well as to increase the water quality.

A 1.4 Regulation for insurance companies

Insurance companies will become important players when natural catastrophes occur on a more frequent basis and with stronger impacts than before. Therefore, it is likely that insurance companies will raise their product costs, which could make them unaffordable for small and middle sized companies. The government can regulate the price building process of the insurance companies regarding to company sizes or other relevant factors. It will be in the interest of the government to ensure a competitive tourism industry, with no monopolies to avoid high prices that harm the total tourism growth.

A 2 Planning and institutions

Another important part of the government dimension is the creation of institutions and departments that are specialised in climate change and adaptation processes. First, they are needed as an entity to coordinate adaptation efforts and communicate results of studies and existing projects to all stakeholders. Second, strategic planning to climate change impacts, rather than reacting to it, “ensures that

more response options are available, and the costs of adaptation are often reduced” (Becken & Hay 2012, p. 52).

A 2.1 Institutions or workgroups

To build of adaptation capacity in Cambodia it will be essential that institutions can coordinate stakeholder action and provide people with expertise on climate change issues. One possible institution could be a council within the national government with the focus of overall project co-ordination and raising funds for research and programs related to mitigation and adaptation. Other institutions could be departments in different ministries that develop research strategies and consult stakeholders according to the research gaps and findings. Interdisciplinary workgroups could also become essential. They can develop adaptation strategies, whereas the different expertises will lead to holistic approaches.

A 2.2 Development planning

For sustainable adaptation strategies it is necessary to consider climate change adaptation in development planning processes. For example destinations that are prone to disasters including floods, droughts, and water shortages should plan ahead and conserve areas from building processes to be kept as natural flood plains or plan how disaster recovery processes are ideally executed. Important to notice is that plans are not perfect. Planning requires constant upgrading and improvement which includes that all planning entities should be allowed to revise their plans on a frequent basis, “without any fear of criticism or sense of failure” (Tompkins et al. 2005)

A 2.3 Disaster risk management

The worst estimated impacts on the tourism sector in Cambodia are natural disasters. Therefore, disaster preparedness and management should be an essential part of any destination management (cf. UNWTO & UNEP 2008, p. 84). Disaster management includes early warning systems, for example those related to floods, storms, heat waves, fire, and disease out-breaks (cf. Becken & Hay 2012, p. 84). It is also important to implement institutions that are responsible and authorised to coordinate all involved stakeholders. There should be a continuous dialog between the stakeholders to ensure that disaster preparedness is given and that the best possible disaster management plans are created with suggestions from different perspectives, from the planners and the practitioners view.

A 2.4 Overall sector co-ordination

In order to establish holistic adaptation systems and strategies it is important that the tourism sector is coordinated by one entity. In this way double work can be avoided and stakeholders that are interested in adaptation but do not know how to, can be reached and initiatives can be united.

A 2.5 Conservation of natural ecosystems

Conservation of natural ecosystems is an important part to sustain the attractiveness of a destination and therefore, to increase the possibility of future tourism growth. Protected areas are “generally considered to be one of the most appropriate strategies for ensuring that terrestrial, freshwater and marine ecosystems are resilient to the additional pressures arising from climate change” (UNWTO & UNEP 2008, p. 86).

A 2.6 Research strategies and institutions

Chapter 4.1 has shown that there has not been sufficient research done on identifying sub regional impact in Cambodia, especially not with a focus on the consequences for tourism sector. There should be open accessible meteorological data sources to support scientific research and modelling studies. Local universities could be encouraged to start co-operational projects in climate research. Appropriate and reliable data is essential for the tourism industry as well as for the government to plan action to adapt to climate change. Most strategy implementation is related to investments that are often not made because of uncertainty.

A 2.7 Country marketing adapted to impacts

Many tourists come to Cambodia with a certain expectation of their holiday destination. It will be the responsibility of the marketing to ensure that expectations are matched and that tourists make well-informed decisions (cf. Becken & Hay 2012, p. 83). It is important to avoid dissatisfaction and a negative word-to-mouth marketing. If there are natural catastrophes it is advisable to inform potential visitors about safety systems that have been installed thereby ensuring that the maximum effort to secure them is under taken. The other option would be to show them alternative activities and attractions within the country.

A 2.8 Funding mechanisms

Climate change adaptation can save money in the long term through an increased capacity and attenuation of the consequences of impacts. Nevertheless, the implementation of efficient adaptation strategies needs sufficient funding. Therefore, it is important to establish and find ways of how the funds can be provided by different stakeholders. This will include, in Cambodia's case, an efficient way to acquire donation funds for specific adaptation projects, as well as other internal mechanisms.

A 3 Program and project implementation

The following section provides an overview about possible indicators for actual program and projects that could be implemented by the government.

A 3.1 Construction projects

Construction projects within the government dimensions mean all projects from the government on the regional or local level. For example the building of sea walls at the coastline against SLR or the construction of sustainable water supply systems in regions where water scarcity is predicted to occur in the future.

A 3.2 Monitoring and evaluation programs

Monitoring and evaluation of implemented adaptation strategies allows the assessment of relevance of these programs. It is important to communicate the outcomes to other stakeholders to ensure that no mistakes are repeated. Monitoring programs also include a continuous analysis of data from different measuring stations, e.g. of SLR or ground water tables.

A 3.3 Education programs

The awareness of climate change and available adaptation opportunities is one of the key factors of a successful adaptation strategy. All involved stakeholders within the government, also from departments which are not in the first instance considered with disaster risk management (DRM), planning processes or marketing, should have at least a basic understanding of what climate change is and what possible impacts can be. Mainstreaming climate change will ensure that impacts are more likely to be considered in planning processes. The training can take place in the form of seminars, speaker events, at conferences, through frequent updates via emails or other distribution channels. It is important that governmental officials at all levels, especially at the local level where the impacts occur, are included into the educational programs.

4.2.2. Tourism Industry Dimension

The following chapter is focused on the tourism industry dimension and includes adaptation possibilities for different industry stakeholders. These are just broad example responses that have to be adjusted to specific circumstances of the enterprises.

B 1 Strategies and marketing

Adaptation strategies for enterprises include medium to long term strategic planning on how to mainstream adaptation into operating procedures. It is advisable for a company to think of adaptation processes holistically and not to focus only on one aspect to increase the effectiveness of such programs.

B 1.1 Product diversification

The predicted impacts for Cambodia include changing seasons, with a longer dry and a more intense rainy season, as well as higher risk of floods. These impacts can acquire product modifications regarding to the target group. “Western” people tend to get unsatisfied if there is too much rain or when it is too hot to practice outdoor activities. Therefore, one possible diversification could be to provide a larger range of alternative activities, including indoor activities, in times where extreme weather conditions can be expected.

B 1.2 Low season closures

In some cases it might be more profitable to shut down enterprises in specific seasons to avoid high operating costs with a minimal utilization of the products or services offered.

B 1.3 Marketing modification

The product modifications will increase the need for the tourism industry to adapt its marketing in order to generate realistic tourism expectations to avoid dissatisfactions. It is also recommendable to inform tourists and business partners in cases of natural disasters or other threats. This can pre-empt cancellations by tourists who are misguided by yellow press articles in their home country.

B 1.4 Tourism networks and co-operation

To increase the effectiveness of various adaptation strategies tourism networks and other co-operational attempts within the tourism industry are good instruments. They provide the opportunity to channel actions and lead to better results. For example tourism networks could discuss and generate forms of co-operational education systems for staff members or deal with issues such as water or waste management.

B 1.5 Insurance - cover and product modification

Cambodia's extreme weather events are going to increase. This will result in higher insurance claims in the long-term from affected tourism stakeholders. For the tourism stakeholders insurance allows "the industry to spread the burdens of those climate-related risks which cannot be avoided by other adaptation measures" (UNWTO & UNEP 2008, p. 85). For the insurance company itself it will be necessary to modify their products in order to be able to work profitable in the long run.

B 2 Management

The management includes the observation, coordination, and implementation of concrete steps and mechanisms to manage one sector.

B 2.1 Crisis management

Crisis management is one of the key adaptation measures as it will depend on the crisis management of the tourism industry how fast tourists are secured and, therefore, what kind of headlines about Cambodia will spread the news channels of the world. A good crisis management should consider all eventually expected impacts and worst-case scenarios.

B 2.2 Waste management

The increased floods and the SLR could make it necessary to consider where waste disposal sites are being located as rubbish could float through the floods to tourism accommodations or toxics can infiltrate the ground water.

B 2.3 Water management

Cambodia's water supply, especially Siem Reap's water supply can be significantly affected by climate change impacts. Therefore, it will be necessary for the tourism industry to plan for their long-term water supply as early as possible. Sustainable ways of water management can be rainwater reservoirs, water treatment plants or the general avoidance of using too much water. The latter could be achieved through offering only showers, tourism and staff education, use towels longer than one day, etc..

B 3 Program and project implementation

The program and project implementation is often the most crucial part of climate change adaptation, as the theoretical plans have to stand the practical test. It is herefore generally advisable to steadily re-adjust management strategies according to the outcomes of monitoring and evaluation programmes.

B 3.1 Construction projects

Cambodia's tourism industry is currently booming and it is expected that the sector growth is going to continue into the next decades. In order to avoid long term problems new building projects will be another key possibility to adapt to expected climate change impacts. For example own water storages or self-sufficient energy supply systems can be installed or, especially near the coastline, replanting of tree's and mangroves can be a part of the enterprise area.

B 3.2 Educational programs for tourists and staff

In order to mainstream climate change generally, as well as adaptation it is important to increase the knowledge about it. Therefore, educational programs should be provided for staff members in the tourism industry, for example in a seminar form or already in educational institutions.

4.2.3. Co-operational and communicational Dimension

The following chapter is focused on the co-operational and communicational dimension. It specifies how the link between the Cambodian government and the tourism industry should be to increase the positive effects of adaptation strategies.

C 1 Disaster risk management co-ordination

In order to avoid bypass channels of alarm systems from different stakeholders involved in the management of disasters and risks it will be essential to co-ordinate the communication in cases of catastrophes.

C 2 Cost sharing

The tourism industry has an outweighing high adaptive capacity compared to the government. Therefore, the government naturally would undertake more actions to conserve national resources and to avoid negative outcomes of climate change. The tourism industry would favour from this situation. The conservation of the natural resources in the country is a typical example for the "tragedy-of-the-common". It will be important to involve the tourism industry into adaptation funding for example through taxes, fees or other instruments.

C 3 Conferences and Meetings

To co-ordinate adaptation strategies and communicate results of initiatives it will be important to hold regular meetings with all main stakeholders. These meetings could be localised or as bigger conferences in Phnom Penh or Siem Reap.

4.3. Evaluation and discussion of existing adaptation strategies

The following part covers the results of the triangular analysis of existing adaptation strategies of the tourism sector in Cambodia. The results are based on a conflation of the outcomes of the in-depth interviews from different stakeholders in Cambodia and the relevant literature analysis. In order to avoid repetitions the indicators, for which not sufficient data could be gathered (either because there

was no literature or the interviews provided limited information content), are either removed or they appear in summaries of indicators with comparable content. This has led to differences of the scope between the indicators in the results parts.

4.3.1. Governmental Dimension

The Cambodian government ratified the UNFCCC in 1996. The signature came along with “commitments to the global community, including regular reporting to the UNFCCC regarding the status of climate change actions, vulnerability, GHG emissions levels, and mitigation and adaptation strategies” (MoE & UNDP 2011, p. 7). One could assume that these many years of dealing with climate change issues should have led to a reasonable knowledge and adaptive capacity of the government. However, in contrast to this assumption the expert of the NGO estimated their adaptive capacity as “very low” (CC, p. 1) and another expert said that his “instinct would be that [they] haven't necessarily got the best people in place for all the jobs and that would also apply to climate change and disaster management ... it really depends on who has their hands on the project” (HT, p. 4). Additionally, the UNDP (2011, p. 14) mentions in their annual report 2011 that if Cambodia wants to respond to climate change it “must develop human resources and institutions, do research, apply appropriate technology, and mobilize funds”. These assessments are a strong indicator that there are some significant gaps in existing adaptation strategies on the governmental side. This conclusion is further supported by another report that states “that there is a policy gap to support climate change adaptation mainstreaming into national and sub national policies, planning and budgetary processes” (AKP 2010, p. VI).

A 1 Policies

Since the ratification of the UNFCCC many policies (see A 1.1) were adopted by the Cambodian government to address issues of climate change (cf. MoE & UNDP 2011, p. 7). Nevertheless, it still seems like some improvement is needed as the MoE et al. (2005, p. 21) assessed that “current policies have not thoroughly taken into account global warming issues”. More recent assessments from the Dan Church Aid and Christian Aid (2011, p. 7) support this estimation and constitute that “Cambodia has not enough laws, policies or strategies on climate change and disaster risk management, although, some policies and strategies on climate change and disaster management are currently in place”. As climate change adaptation is an interdisciplinary field it is important to mainstream it into policy and regulation formulating processes in various agencies.

A 1.1 Adaptation policies

Cambodia has several laws which are dedicated to sustainable use of natural resources or development and, therefore, can partly be considered as adaptation policies, even though there was probably no consideration of climate change impacts while enacting them (cf. Open Development Cambodia 2012, [online]). They include:

- Article 59 of Cambodia's' constitution, adopted 1993 (cf. Cambodian Embassy 2012, [online])
- Royal Decree on the Designation and Creation of Protected Areas, enacted 1993 (San 2005, p. 1)

- Law on environmental protection and natural resource management, enacted 1996
- Sub-decrees on pollution control and Environmental Impact Assessment, enacted 1999 (San 2005, p. 8)
- Forestry Law, enacted 2002
- Law on Management of Water Resources in Cambodia, enacted 2007
- Protected Area Law, enacted 2008
- Draft Sub-Decree on River Basin Management
- Draft Sub-Decree on Water Licensing
- Draft Sub-Decree on Water Quality

Additionally, there is currently a draft of the Law on Disaster Management, which specifically mentions the threats of and need for adaptation to climate change to build the “communities’ resilience to disasters and to the adverse effects caused by climate change”. Furthermore, an article recommends to “mainstream disaster risk reduction and climate change adaptation into processes such as policy development, social-economic development plans, budget allocation and governance” (RCCDM 2012, [online]). This draft indicates that the government has started to sufficiently consider climate change issues in their new policies, at least in a key sector such as DRM. Apart from that the results show that climate change is insufficiently considered in policies that could be from the framework for adaptation strategies.

A 1.2 Building regulations

The interviews have shown that “there are building regulations” (CC, p. 3). There is for example a regulation that buildings need to be 70-100m behind the grass growing line next to the coast. The head of the Planning and Development Department of the MoT would like to extend this line to 500m, but constitutes that the implementation of such a regulation would be difficult as most of the seaside areas belong to private owners. Another regulation for Siem Reap says that it is not allowed to build higher than three floors (cf. MT, p. 5). Nevertheless, the enforcement of these regulations is often a problem and there are regional differences on the policy application. The Apsara authority is for example strict regarding regulations within the Angkor park, but there are some issues in Siem Reap itself. This is not just the case for Siem Reap. The UNESCO constitutes that it is generally difficult to apply regulations on a local level (cf. UO2, p. 1). This estimation is supported by the NGO expert who said that he is sure that people can get around regulations (cf. CC, p. 3). The estimations have shown that there are building regulations, but the enforcement on investors is an issue for the government.

In order to avoid future complications it will be necessary to inform new building owners about impact predictions. The compliance of the regulations should be in their own as well as in the government's interest, because disregard can lead to tremendous costs of building damages or security issues. Both can lead to image damages of regions in Cambodia or Cambodia as a whole.

A 2 Planning and institutions

Since the ratification of the UNFCCC the Cambodian government has implemented workgroups and institutions with a focus on climate change. In the recent years different development plans considered climate change and there is a general trend of mainstreaming the issue. Nonetheless, the capacity of

these institutions is limited and development planning does not always consider climate change impacts sufficiently (see below).

A 2.1 Institutions or workgroups

The Cambodian government has different institutions and workgroups with a focus on climate change. The head institution is the National Committee on Climate Change (NCCC). It was established in 2006 (cf. MoE & UNDP 2011, p. 7). The committee consists of representatives from 19 ministries and is chaired by Prime Minister Hun Sen personally (cf. Botkosal et al., p. 10-11). The MoT is no member in this committee. This indicates that the government does not consider climate change as a threat for the tourism sector so far.

The responsibilities of the NCCC are: “(i) coordinating the implementation of climate change activities in Cambodia; (ii) developing climate change policies, strategies, legal instruments, plans, and programs; and (iii) the integration of climate change concerns into relevant policies, strategies and legal instruments” (cf. Botkosal et al. 2010, p. 11). Another main institution is the Cambodian Climate Change Department (CCCD), subordinated to the MoE. The CCCD is acting as the secretariat for the UNFCCC and is responsible for its implementation as well as promoting research activities, human capacity building, and the development of new project proposals (cf. Botkosal, et al., p. 11).

The expert from the UNDP who is working closely together with the CCCD says that the strength of the department is its willingness to coordinate and harmonise the different stakeholders, and the capacity in terms of managing and leadership. The main weakness, on the other hand, is the coordination and implementation of climate change work in Cambodia. The causal factor for that is the recent promotion of the CCCD from an office into its own department, resulting in many new staff members joined the department without appropriate knowledge about climate change issues. Additionally, many experienced staff members are frequently on international conferences and not available in the department (cf. UP, p. 5).

Another harming factor is the limited involvement on climate change adaptation and mitigation from other ministries as they consider climate change to be solely an environmental issue and therefore in the responsibility of the MoE. This assumption is understandable as all agencies are subordinated to the MoE and they also were appointed in 2003 as the Designated National Authority (DNA) for the Clean Development Mechanism⁶ (CDM) and therefore manage the money flow of emission trade certificates (cf. AKP 2010, p. 4). This leads to the current situation that there is limited capacity in agencies/ministries apart from the MoE (UP, p. 6). It can be assumed that this is the same case for the MoT where there is currently only a small committee, led by Mr. Neb Samouth, with a focus on the link between tourism and climate change, which was installed in 2011 (MT, p. 8).

Another institution on the national level is the Cambodia Climate Change Alliance (CCCA). It is funded by DANIDA, EU, SIDA, and the UNDP and is realised by the UNDP in cooperation with the MoE. It is the highest funded climate change program in the country with a future total support of 8-10 million USD (currently the project funds are 8.9 million USD). The project supports the NCCC on policy

⁶ The CDM is defined in Article 12 of the Kyoto Protocol and allows a country with an emission-limitation commitment to implement an emission-reduction project in developing countries as an offset (UNFCCC 2012, [online]).

consultation and implementation, general capacity building, and awareness rising in Cambodia (UP, p. 2).

To respond to disasters Cambodia installed the National Committee for Disaster Management (NCDM) as well as the provincial, district, and commune disaster management committees (UP, p. 9). But their effectiveness is limited (see below A 2.3). The World Bank (2012b, [online]) criticised that the isolated responsibilities and funding of the two main agencies for a successful adaptation, the CCCD and the National Committee for Disaster Management (NCDM), can create barriers to cooperation.

On the regional level UNESCO has tried for a couple of years to implement a water working group in Siem Reap, which would gather data about the water tables to enable stakeholders to initiate a sustainable water management. Currently, hotels in Siem Reap are pumping by themselves and even pump back the wastewater into the ground. The expert from the UNESCO says that “since two years this whole working group, or the establishment of it, has, been somehow blocked ... [He] think[s] there are some internal forces at play which make it difficult to have this group established right now” (UO3, p. 2).

An already existing institution on the regional level is the National Coastal Steering Committee (NCSC) which “is responsible for setting the overall direction of coastal projects and activities related to natural resources” (MoE et al. 2005, p. 10). This institution can be the main player for coastal adaptation strategies.

The investigation has shown that many efforts have been made to create the institutional framework for climate change adaptation, but it seems that the effectiveness of the different entities needs to be improved. Another finding is that the main efforts to improve this situation is being done by the UNDP or other IGOs and is solely based on external funding.

A 2.2 Development planning

The expectation of continuous rapid development of the tourism sector in combination with the estimated climate change impacts brings new challenges for development planning. One expert said that development has been faster than anybody expected which led to complications, but he sees that “now measures [have] really been taking and you have strong steps on the political level” (UO3, p. 5). Nevertheless, he explains that planning is still very ad-hoc or short time and that there is a behaviour change, but not enough structural changes have been undertaken (cf. UO3, p. 5). Another expert supports this estimation and says that “Cambodia is following a very typical cycle of tourism development ... The big concern at the moment is how to develop quickly and expand the industry. There is very little thought about environmental impacts of that expansion ...nobody here is taking any notice of water supply... and the capacity of the supply system to deliver it. Everything is always just catching up” (CC, p. 3). These ad-hoc planning and reaction to occurring problems can lead to significantly higher costs which could be avoided through preventing planning from climate change adaptation.

The main document developed for planning and implementing climate change adaptation is the National Adaptation Program of Action to Climate Change (NAPA). It was developed by the government, funded by UNDP/GEF, in 2006 and identified 20 high priority adaptation projects which would be needed for climate change adaptation. The general objectives of NAPA were to: “i) understand coping

mechanisms to climate hazards and climate change at the grassroots level; ii) understand the main characteristics of climate hazards in Cambodia; iii) improve agricultural productivity through the expansion of irrigation and the management of water resources to reduce vulnerability to natural disasters; iv) identify and prioritize adaptation activities to climate hazards and climate change; and v) understand existing programs and institutional arrangements for addressing climate hazards and climate change” (Dan Church Aid & Christian Aid 2011, p. 9). Based on some findings of the NAPA the Strategic National Action Plan 2008-2013 for Disaster Risk Reduction (SNAP-DRR) was launched in 2009, “which integrates DRR elements into sector policies and investment planning” (AKP 2010, p. 8).

In the same year (2009) Cambodia developed a National Green Growth Roadmap. Participant of the working group was Mr. Bou Chan Serey from the MoT (cf. MoE & UNESCAP 2009, p. 3). The Roadmap has set up, among other things, climate change adaptation and mitigation strategies, and programs to mainstream green development into key sectors, including the involvement of the private sector (cf. Dan Church Aid & Christian Aid 2011, p. 6).

The MoT (2012a, p. 9) itself does not consider climate change impacts or adaptation sufficiently in their new Tourism Development Strategic Plan 2012-2020. The plan identified climate change as a threat, whereas it is just mentioned in two sentences in the report under other risks. This indicates that the MoT does not consider climate change as a big threat for tourism, and the ministry seems to have limited knowledge about possible impacts or adaptation options. It will be necessary to mainstream climate change adaptation through the key planning entities within the MoT.

External of the MoT there is the Angkor Heritage Management Framework by the UNDP which intends to improve the adaptive capacity of the tourism sector. Part of the project is to develop “a risk map which encompasses the structural, monumental, environmental and socio-cultural risks; A tourism management plan; [and] Capacity building for APSARA pilot projects” (UNDP 2012c, [online]). These efforts can lead to sufficient adaptation planning in the main cultural park of the country and should be considered for implementation in other tourism hubs in the country.

The investigation has shown that there are some planning processes which consider climate change adaptation, but also that especially in the key planning institutes for the tourism sector climate change impacts are considered insufficiently.

A 2.3 Disaster risk management

The Cambodian government has installed an early warning system, which is based on the top-down principle from the national to the community level. The highest instance is the NCDM. In cases of an emergency they are supposed to inform the Provincial-Municipal Committee for Disaster Management. Then the warning goes down to the District and Commune Committee for Disaster Management. Supported is this system through information about climate and weather from the Cambodian Ministry of Water Resources and Meteorology. One expert estimated that the system is ok until the provincial level, but that it does not work on the village and community level: “People are not ... get[ting] information about for example floods” (UP, p. 9). The expert believes that “Cambodia can do more ... on preparedness intervention. [She] think[s] [they] should strengthen [their] early warning system” (UP, p. 8).

The World Bank (2012b, [online]) shares this perspective and constitutes that early warning and communication systems are weak and that there are no reliable forecasts of extreme climate events. Villagers seem to rely on word of mouth warnings from other villages. They constitute that “disaster risk management in Cambodia is the purview of a wide variety of actors and institutions which lack coordination, suffer from fragmented external support, and are unable to keep up with the Cambodia's disaster response”. Another study see the causes in a general limited capacity and experience of key ministries for disaster management and criticizes that “there are minimal quality guidelines or instructions, tools or resources for them to follow” (Dan Church Aid & Christian Aid 2011, p. 11-12). Whereas, the limited experience probably do not refer to disasters as the country is facing floods and droughts on an annual basis. These estimations draw a clear picture that there is a need to improve the DRM in Cambodia, especially as floods and other extreme weather events are likely to happen more frequently.

However, has recently been some action undertaken to improve the situation. The ministry of national funds has for instance prepared a special unit for urgent disaster intervention in 2012 (cf. UO3, p. 9). As before mentioned the disaster risk preparedness is suffering under a lack of financial and institutional support as those are mainly on an ad hoc and project-specific basis. But “there is now a trend towards more programmatic approaches that include disaster risk prevention instead of focusing solely on response” (World Bank 2012b, [online]). It is to hope that the Law on Disaster Management will improve the situation of unpreparedness and serve as a framework for a holistic and efficient DRM in Cambodia.

An example which showed how the government was unable to deal with a disaster sufficiently was the flooding in autumn 2011 in Siem Reap. The whole city was flooded by heavy rains and a newly build bypass road acted like a dyke and intensified the flood (cf. HT, P.3). One expert from Siem Reap says that “the local authorities were very unprepared for such a thing” (CC, p. 1). After four weeks the government made some holes into the road to let the water go. Since then the “Apsara Authority has deployed a lot effort to work on a dike on the water system to avoid any other floods in the future” (UO3, p. 2). In this particular case there was no life threatening situation for tourists, it was just inconvenient to wade through dirty water, but it showed that the DRM committees were unable to identify the main cause of the problem effectively and react appropriately. The MoT (2012a, p. 8) supports this point in their new development plan and constituted that “rescuing systems for tourists in danger are still limited, particularly along the further tourist destinations in the forest or sea areas”.

The first steps of improvement seem to be in process with the new law and some interventions in Siem Reap. Nevertheless, there is a need to create and improve the existing DRM strategies to deal with intensified extreme weather events in the future. This includes the cooperation with the private sector to ensure the visitors safety.

A 2.4 Overall sector coordination

The Cambodian government, supported by the UNDP, held in 2009 and 2011 the national climate change forum, where different stakeholders discussed about climate change issues. These resulted in new institutional arrangements and some action towards conception of new laws and regulations to deal with climate change issues (MoE & UNDP 2011, p. 7). The MoT or the tourism sector has so far

not effectively been a part of these types of meetings or conferences. The World Bank constitutes that “there are poor coordination mechanisms within the ministries, between ministries and agencies, and between the government and civil society organizations” (World Bank 2012b, [online]). It can be assumed that this is also the case for the general co-ordination of the tourism sector. Strong indicators of a low willingness or effectiveness of co-ordination and regulation of the sector is the existing tax avoidance (see C2) and the possibility to bypass building regulations and other policies by the private sector. It could be that the MoT is too focused on developing the tourism sector. This results in a loss of control as everybody who invests enough money is able to independently without consideration of other stakeholders or interests.

Apart from the tourism sector there is another body that coordinates climate change efforts, mainly by its NGO and IGO members, namely the National Climate Change Network in Cambodia (NCCN). They try to improve the dialogue between different actors and influence the climate change agenda (see appendix 8).

This examination leads to the conclusion that the overall sector coordination can be improved. Insufficient coordination seems to cause twice the amount of work since foundation building programs are not connected and there appears an inactivity of different stakeholders who would participate in adaptation initiatives, but are not willing to start one on their own.

A 2.5 Conservation of natural ecosystems

Cambodia officially has various conserved natural areas. Nevertheless, there are still issues such as illegal deforestation, which is not completely under control (CC, p. 3). The MoT in contrast wants to sustain the nature to attract tourists. However, they are aware that this is not under their control. Therefore, they cooperate with the MoE and the ministry of cultural, forestry, and fishery (MT, p. 3). They also implemented various small-scale conservation projects, such as “one tourist, one tree” where they try to encourage tourists, in some regions of the country, to donate for conservation and plant a tree (MT, p. 3).

The Cambodian government considers tourism as ‘green gold’. Therefore, they try to promote the growth of the ecotourism sector (cf. MoT 2012a, p. 3). It can be argued that the MoT is trying to promote natural conservation only in the country-side and the mountain regions. The tourism hubs such as Siem Reap, Phnom Penh, and Sihanoukville, are different because the MoT is mainly focused on fast development processes and environmental issues are not sufficiently considered in their planning (for example there is the already mentioned water management issue). However, the focus on the green development and the consideration of tourism as the ‘green gold’ shows that the government has started to engage environmental thoughts in their planning processes. The question is if there is awareness of how naturally conserved ecosystems could reduce impacts of natural disasters in some regions of the country.

A 2.6 Research strategies and institutions

Cambodia has the commitment to frequently undertake scientific climate change research and report it to UNFCCC. So far two comprehensive “assessments have been undertaken – the Initial National Communication (INC), in 2002, and the Second National Communication (SNC), prepared in 2010 and

2011 by the MoE” (MoE & UNDP 2011, p. 7). Nevertheless, the reliability of these reports has been criticised by different assessment reports as well as by the experts from the interviews.

One report says that long-term research programs are not sufficiently developed (Dan Church Aid & Christian Aid 2011, p. 6). The World Bank (2012b, [online]) mentions that “meteorological information for Cambodia is sparse, and a country-wide network of hydro-meteorological stations needs to be established”. Another report says that “meteorological data in Cambodia is especially poor, and climate predictions are uncertain” (Oxfam & Kyoto University 2008, p. 9). One of the most recent scoping studies about climate change in Cambodia “has noted difficulties in gather even basic data” (AKP 2010, p. VI).

One expert supported this estimation and said that there is no “final understanding of what the key vulnerabilities are. [He] think[s] it is assumed that Cambodia is part of the Mekong and the vulnerability of the Mekong is like this” (SE, p. 3). He criticised that there are general vulnerability estimations, but that “vulnerabilities are highly differentiated” in the regions. That makes it difficult to develop precise adaptation action and leads to “much discussion in [the] adaptation literature” (SE, p. 3). Currently, much work is started in the water sector related to dams and fisheries (cf. SE, p. 3), but there is no research focused on the vulnerability of the tourism sector, except from some work of UNESCO on the Angkor site. They are “in the midst of working on a system which allow[s] [them] to see the impacts of climate change on the site. ... which will give [them] information, not only on the situation on the monument, but also on the situation on the environment. ... which is all important for the management of the site (UO1, p. 5).

Another problem is that existing research findings are often not communicated properly to the private sector. The expert from the tourism industry said that his “feeling would be that, certainly compared to Europe, that [they] are doing a lot less here in terms of understanding, analysing, and monitoring” (HT, p. 2). He hardly heard about scientific research or reliable studies related to climate change in Cambodia. This shows another field of improvement for research institutions.

Almost all considered estimations on the existing research in Cambodia are negative. Therefore, it is possible to claim that improving the research strategies and reliability of data is one of the most important actions to improve climate change adaptation in Cambodia. Reliable data as well as its distribution is essential as adaptation strategies and actions do cost money and most stakeholders, especially from the tourism industry, will not be willing to invest money, if there is a high uncertainty concerning whether impacts will occur or not.

A 2.7 Country marketing adapted to impacts

The MoT (2012a, p. 18) estimates that their own “marketing and tourism promotion of Cambodia is quite limited”. Nonetheless, they do initiate some target-oriented marketing campaigns such as attracting Arab people to visit Cambodia to experience the rainy season and the tropical forest (cf. MT, p.2). This marketing initiative could be considered to be partly climate change adaptation as it could prevent the visitor number to drop during the rainy season. Nevertheless, their most efficient way is joint ventures with the private sector. Such a joint venture already initiated the successful promotional campaign ‘Cambodia - Kingdom of Wonder’ (cf. MoT 2012a, p. 18). The limited funds and initiatives of the

government indicate how important the dialog and the general education of the tourism sector about climate change will be to improve the overall marketing as part of an adaptation strategy.

Another opportunity to improve the image of Cambodia and to immediately adapt to climate change impacts is a good public relations campaign aimed at communicating how tourists are being protected within the country. For example the government produced some media-effective headlines through rescuing 200 tourists from the floods in the Bantey Srei temple with a helicopter in 2011. The expert from the tourism industry said he was laughing because normally it is very unlikely to get a free helicopter ride from the Cambodian government. He meant that the tourists were in no real danger and just stranded, but he thinks “in itself that was quite a good form of marketing, because it basically said that there is a problem but we solved it very effectively and quickly and that was obviously in contrast of the news coming out of Thailand” (HT, p.4-5). This case showed that the Cambodian government was capable of responding quickly when it came to tourists in danger.

A 2.8 Funding mechanisms

The Cambodian climate change adaptation is mainly funded on a donor basis. The government itself allocates small budgets to implement climate change and DRM projects. This means they are “heavily depended on external funding supports” (Dan Church Aid & Christian Aid 2011, p. 8). One expert said that the government does have a little budget, but also prefers it to wait for outside help. He said, “When disasters happen, they are waiting for someone else to pick up the bill and pay the check. So they are not always that fast to mobilise” (HT, p. 4). Another expert sees this from a more positive perspective and said that the expression of the government for specific support for projects shows that they are aware of the climate change problem (SE, p. 2).

Generally, it is to assume that Cambodia’s available funds for climate change adaptation will increase as the “funding support globally will increase from around 30 billion US\$ to 100 billion US\$ by 2020” (UP, p. 3). There are already funding mechanisms through the UNDP, DANIDA, SIDA, EU, JICA, World Bank, etc. as well as a special adaptation and climate investment Trust Fund for Cambodia. Nevertheless, the expert from the UNDP thinks that they need more funding. The support so far “is used for some of the priority sectors only and there are still many opportunities or potential projects to be funded, especially for projects that remain unfunded in the NAPA” (UP, p. 3).

Parts of the additionally funds needed for climate change adaptation could be generated through the private sector, but to enforce charges seems to be a problem in Cambodia. The MoE has tried for two years to collect taxes for water use from tourism businesses in Siem Reap. The UNESCO “don’t think it [has been] implemented yet” (UO3, p. 3). The MoT on the other hand said that there is a water treatment plan existing where tourism businesses have to contribute for example to use the drainage system (MT, p. 7), but it can be assumed that the enforcement of the latter is not effective. The Cambodian government is also suffering from high revenue losses from the tourism industry. Approximately 25% of the total income of the tourism sector leaks out of the country (cf. MoT 2012a, p. 8). Especially Chinese and Korean tourists often fly into Cambodia with their country based flight companies, stay in a hotel, eat in restaurants, and go to shopping malls which are all owned by their compatriots. Therefore, the benefit for the local businesses or the Cambodian government is very small. However, the government has not yet set up any regulations to change this business tactics and increase their tax

revenue (MT, p. 4). Parts of these tax losses could, for the case they would orderly be collected, be used for climate change adaptation initiatives.

The investigation has shown that the funding of climate change adaptation is mainly external and that the tourism industry is not involved in the funding process. This funding situation includes the problematic that the donors implement programs and projects. It can be assumed that the government is often not involved sufficiently or as ambiguous as when they would initiate the projects by themselves. On the other hand a question to raise is whether climate change adaptation actually requires all the funds that the government does not have.

A 3 Program and project implementation

The concrete program and project is a crucial point within the governmental dimension. For example it is problematic that policies and regulations can be avoided or that insufficient tax collection harms fund-building processes. Insufficient funds are a harming factor for implementing projects. The NAPA for example suggested 39 projects of medium and high priority and only a few have been actually realised until now (cf. UP, p. 3).

A 3.1 Construction projects

One finding is that insufficient planning often results in partly disastrous consequences, such as the ring road during the flooding of Siem Reap in 2011 or the buildings on natural flood plains, which normally would reduce the impacts of floods. After the flood the government relocated some families that were living on the river and flattened their houses to create some extra flood plains. The problem is, according to one expert, that the river further downstream is not widened at all. Therefore “it's not going to have any impact whatsoever apart from a very short spam of capacity to be able to absorb more water until that little bit of extra vent is full” (CC, p. 2).

The investigation could not find many building projects with the focus on climate change adaptation and the existing projects do not seem to fulfil their purpose sufficiently.

A 3.2 Monitoring and evaluation programs

In the section A 2.6 was mentioned that the general research planning is quite limited and that there is space for improvement on the meteorological monitoring as well as the specific impact estimation for different regions. The World Bank (2012b, [online]) supports this and estimated that “there is a lack of monitoring and evaluation, as well as reporting mechanisms from the government bodies”. They consider little commitment of governmental officials, “a lack of salary, knowledge, and tools to implement the projects” as the main harming factors.

The expert from SEI adds that another major issue is the usability of the study reports for governmental officials due to a language barrier as well as generally complicated forms of expression by scientists. He criticises their own work with the ‘Adaptation Knowledge Platform’, which is currently mainly used by students or scientists, but not many local stakeholders seem to use it. They plan for the near future to simplify their findings and create some translation of key reports as well as develop “a network of local researchers who have the capacity to interact with decision makers and share the information” (SE, p. 5).

Nevertheless, there are some existing programs that can be considered as good-practice examples. There is for instance one program from Pact (2012, [online]), which specifically monitors and evaluates climate change interventions in order to assist “practitioners and funders in leveraging the power of networking to improve organizational performance and achieve cross-cutting goals in regional responses to climate change”. The project is called ‘Sea Change’ and is based in Cambodia. The SEI expert said that the program “is quite [a] pioneer in developing monitoring and evaluation approaches for climate change” (SE, p. 4).

The examination shows that there are very limited evaluation programs in Cambodia. However, it is important to not forget the evaluation from the big donor organisations, such as UNDP, on their own programs. They are currently responsible for the main share of adaptation projects and programs. It will be important to communicate these program evaluations to other entities to increase the effectiveness of future projects.

A 3.3 Education programs

The expert interviews showed that the awareness of governmental officials is generally low and that sub-national officials have significant knowledge gaps. The NGO expert estimated the awareness as very low and based this assessment on experiences with local departments of the MoE in Siem Reap (cf. CC, p. 1). This expression is shared by another expert who said that “if you get the right people it may appear high, but actually if you would do a broad poll, I don't think there is that much awareness really” (HT, p. 7). A third expert estimated that officials at least on the national level know what climate change is, but have problems to integrate climate change related action into their agency planning (this does not include the specific climate change entities and their officials); “they are still missing technical capacity to mainstream the climate change into their priority or intervention” (UP, p. 7). One significant finding is that only the expert from the MoT estimated that most of the governmental officials are aware of climate change issues. Furthermore, he said that people at the top level worry about the changing climate as they all can feel it (cf. MT, p. 9). These statements show that there is no clear finding on the level of awareness, but it indicates that there is limited knowledge within a part of the government.

One way of increasing the knowledge of governmental officials is the participation at conferences or workshops in or outside of Cambodia. This is already an ongoing practice and representatives from different agencies join conferences and discuss about climate change. The MoT frequently joins conferences about ecotourism or new technologies where they get some new knowledge input (cf. HT, p. 7). The issue here is the communication of this new knowledge within the ministry or beyond the ministries. One expert doubts that this is being done sufficiently (cf. HT, p. 7).

Another way is educational programs for governmental officials. The UNDP has two programs with this focus. One is a capacity building project for local NGOs and the sub-national administration (cf. UP, p. 6-7). The other program belongs to the CCCA and they currently are doing a study to identify knowledge gaps of their staff members with the aim of developing a capacity-building program (cf. UP, p. 5).

It is possible to argue that there is limited knowledge about climate change as well as limited approaches within the government site to inform about this issue. There is some work being done, but it

seems like these efforts are all external and initiated by NGOs and IGOs. In order to cope with the booming economic development of the tourism sector new staff will be needed within the private sector as well as the government. The MoT (2012a, p. 27-28) estimates that increasing visitor numbers could require 500,000 extra tourism professionals in different professions by 2020. In their development plan they suggest to build a National Tourism Professional Institute and to support existing private educational establishments to meet the demand of new employees. Therefore, there already are existent educational forums that could be used for climate change training purposes for MoT officials.

4.3.2. Tourism Industry Dimension

The tourism industry in Cambodia is currently in a period of massive expansion. Around the world, for example in Italy or Spain, there was not much awareness or concern about environmental issues and other problematic the tourism industry causes and faces until some real problems occurred. It can be assumed that Cambodia is following the same process. The expert from ConCERT estimated the awareness among their network partners from the tourism industry about climate change as very low. However, there are some differences between for example the managers of international hotel chains which “obviously within that framework ... know very well about climate change and about environmental impacts ... but anything that's been driven by an awareness within Cambodia is virtually nonexistent” (CC, p. 1). The representative of the tour operators said that he and his colleagues are experiencing the changes of the climate, but do not have a clear picture of the impacts which makes it difficult for them to react (cf. HT, p. 1).

B 1 Strategies and marketing

The tourism industry does not seem to consider climate change impacts in their strategies or marketing processes. There are different indications that adapting processes are already happening, but most of these were not initiated because of climate change issues.

B 1.1 Product diversification

Product diversification in changing conditions is an essential part to sustainably operate profitable. The expert from Hanuman Tourism said that they actually do not consider climate change impacts at the moment. They adapt their products to the different seasons, which include shifting seasonal patterns, but they do not specifically adapt to climate change as they have limited reliable data and the uncertainty is too high (cf. HT, p. 2). The NGO expert also does not think that “the change in the rainy season has become significant in people’s minds” (CC, p. 5). Therefore, it is possible to argue that the tourism sector is not consciously adapting to climate change at the moment.

Nevertheless, there are some product diversification processes going on which could be considered to deal with changing tourist demand and climate adaptation in a broad perspective. Hanuman Tourism for instance offers safari style camping tours throughout Cambodia whereas they do not sell this product during the rainy season. This includes the increased warning of tourists about travelling times where rain patterns are uncertain (cf. HT, p. 2).

One advantage that may cause inaction is that tour operators, in contrast to accommodation and service supplier, can modify their itineraries in cases of extreme weather events on an ad-hoc basis. One expert attributes the tour operator with a high adaptive capacity as it is about making profit for them and the country still holds many unspoiled attractions for tourists, such as temples and other historical sites (cf. UO2, p. 8). The Apsara Authority for instance “is also working in diversifying the products that the tour operators can offer to the tourists” throughout the Angkor temple site (cf. UO2, p. 8). One expert from the UNESCO considers this diversification of tourist flows in the Angkor Park as partly a conscious adaptation process to climate change (cf. UO2, p. 8). Nationwide, according to the MoT (2012a, p. 11), only 10 percent of the historical heritage sites been used as tourism destination, which shows how big the alternatives for tour operators are. It can be concluded that the changing climate patterns are leading to an increase in ad-hoc reactions, but no long-term strategic adaptations.

B 1.2 Low season closures

Low season closures in the tourism industry are not wide spread in Cambodia. There are a few accommodation suppliers and Mekong cruise companies that close down for a few months a year, but generally the industry tries to attract tourists in the low season with price drops down to half of the high season prices (at least by hotels). This leads to more visitors from Asia, regional tourists, who are more price sensitive (cf. HT, p. 5-6).

In general the climate of Cambodia allows the tourism industry to operate during the whole year. Climate change impacts are not likely to lead to conditions that will radically change this. Increased extreme weather events could cause short time closures of different regions and higher temperatures during the dry season can lead to unpleasant conditions, at least for western tourists or visitors from colder climatic conditions. Nonetheless, it can be argued that low season closures are not necessarily needed, apart from specific service suppliers for example wooden canoe tours through flooded forests on the Tonle Sap which simply cannot happen as there is no flooded forest during the dry season.

B 1.3 Marketing modification

The expert from Hanuman mentioned that they adapted their communication towards partner agencies and tourists during the flood in Siem Reap in 2011. They posted the latest situation updates via a blog on a daily basis. This was particularly important for their partner agencies, who on the one hand wanted to avoid unprepared complains from guests in the country and on the other hand to be able to provide appropriate information while selling tours. The expert said that they adapted their communication at that time and since then it affected how they advice people about travelling times (cf. HT, p.4). Apart from this case, in combination with the product diversification and the marketing of it, there is no finding of specific adaptation in marketing in relation to climate change. However, it would have been surprising as the uncertainty of the impacts is still high and probably too high for the tourism industry to consider them at the moment.

B 1.4 Tourism networks and co-operation

The Cambodian tourism industry is mainly organized in two tourism networks: the Cambodian Association of Travel Agents (CATA) (2010, [online]) and the Cambodian Hotel Association. Both of these organizations are “advocating government policy to develop the tourism industry”. The CATA is

officially accorded by the government as the representative of the tourism industry. This allows them to review tourism policies before their implementation, work out alternative policies, and convey them to the concerned government (cf. CATA 2011, [online]).

Significant is that none of these two networks are mentioning or provide any information about climate change issues on their websites. Even though, both networks could provide a good platform to mainstream climate change throughout the tourism industry. For example the CATA (2011, [online]) holds regularly General Membership Meetings “for business networking and updating on current tourism - related issues and topics”. Therefore, knowledge about climate change could easily be spread, at least to the members of these networks.

B 1.5 Insurance – cover and product modification

There were no clear findings for modification of insurance products or covers. One expert from the tourism industry estimated that increased flood risks certainly “must be affecting payments and prices” and he guessed that the claims “would have gone up dramatically in the last two or three years” (HT, p. 3). However, there will be further research needed to confirm this estimate.

B 2 Management

The section above has shown that the tourism industry in Cambodia is not doing much consciously to adapt to climate change. The same can be said on the management section. There are some attempts to manage water resources by individual hotels or lodges, but generally this study could not find that there is much concern about adapting to changing climatic conditions.

B 2.1 Crisis management

There are no clear findings whether the tourism industry has significantly improved their crisis management in the recent years. One may assume that bigger companies have some form of preparedness whereas smaller companies often do not have systematically approaches. The expert from Hanuman for instance said that “it is quite difficult, in terms of planning because some people have to travel when they want to travel” (HT, p. 2). Nevertheless, he does “think that people are perhaps more forgiving in destinations like Cambodia” when they for example get stuck in floods, because they might expect adventures or read about the possibilities in guidebooks (cf. HT, p. 5). Nonetheless, for a holistic adaptation plan it is important for tour operators and accommodation suppliers to increase their crisis preparedness to cope with future impacts, even if tour operators can modify itineraries on an ad-hoc basis some critical situations could occur.

B 2.3 Water management

The predicted climate impacts include longer and hotter dry seasons for Cambodia. Therefore a good water management is likely to increase in importance for the tourism sector. However, the tourism industry does currently have some significant problems in this field. One UNESCO expert said that “one of the biggest issues is waste water management, because ... a lot of waste water created is being pumped back into the water table” in Siem Reap “and it’s obvious that if tourism continues to rise ... then this will have an effect” (UO1, p. 3). He is worried about the lack of reliable data to improve the water management in the town and said that currently “there are technical steps which

[have] been taken, but there are political issues which takes time to solve". Furthermore, he said that the department of water resources within the Apsara Authority is aware of how to solve the problems and is an "institution that really is concerned" (UO1, p. 3). There are some hotels such as Sofitel Angkor with its own purification system for water that provides exact data about how much water they use, but they are an exception (cf. UO1, p. 3). Apart from that, there are a few lodges and smaller accommodations throughout the country who have water management systems, such as the 4 Rivers Floating Lodge (2009, [online]).

There are no effective regulations on the water management of hotels and other businesses in Siem Reap as well as in other regions in the country. This leads to the situation that everyone is operating in their own interest and without any consideration of future water availability. The MoE itself constitutes that "without improved management, changes in water availability could lead to reduced water quality and greater water scarcity, particularly in the dry season – in turn leading to increased competition between sectors and among different users" (MoE & UNEP 2011, p. 52). Therefore, it can be highlighted that improving the water management of each tourism industry stakeholder could become a crucial factor for the future development of the sector. Clean water has the potential to become the most important resource for the tourism industry in Cambodia, but the management in the private sectors has not calculated this risk into their actions.

B 3 Program and project implementation

The program and project investigation has shown that there are a few existing educational programs, but even they do not consider climate change sufficiently. There was no sufficient data available to be analysed on building projects from the tourism industry.

B 3.2 Educational programs for tourists and staff

Knowledge about climate change issues is an important part of a successful adaptation strategy in tourism, as on the one side tourists are more forgiving when inconveniences occur and on the other side professionals start to consider climate change issues in their operation processes. The awareness among tourism industry stakeholders in Cambodia who operate nationally was estimated to be very low. The international tourism chains, for example Sofitel, are more likely to have a certain level of awareness among their management staff.

The ministry of tourism tries through initiating stakeholder meetings to raise awareness or at least bring people together. For example in August 2012 they did invite different representatives from the private sector to a seminar run by a Korean company that aims to invest into solar energy in Cambodia (cf. MT, p. 8). Other educational programs are initiated by the CATA (2011, [online]) as well as the Cambodia Hotel Association who both run human resource training and staff seminars for their member enterprises. It is to estimate that they do not consider climate change as a relevant topic so far. Nevertheless, provide these seminars a platform for future trainings on this issue.

ConCERT is providing tour guide trainings with components of education about social and environmental impacts of tourism. This also includes a little overview of the challenges sustainable tourism management has to face. They intend to raise awareness without providing any solutions. Besides these programs the expert also lectures in some modules at the University of Battambang for the de-

gree of sustainable tourism. He has the feeling that in both educational programs there is no active interest, but he sees people who start to talk about the topics raised (cf. CC, p. 6-7). These kinds of educational programs could be used to mainstream more specific knowledge about climate change, where there is some guidance needed. The expert from Hanuman said that he would be happy to include more knowledge, for instance about impacts or adaptation, in their guide trainings or communicate it to customers, but he is missing reliable data and a leading institution to supply the data (cf. HT, p. 6). Currently they are including education about climate change mitigation, how the western guests think about it, and “why these might be an issues” in the future (HT, p. 6).

However, this investigation could not find educational programs about climate change in Cambodia from the tourism industry for tourists. Nonetheless, it will be important to educate tourists before a journey to Cambodia about the possibility of extreme weather events, especially during some periods of the year, as these could affect their itineraries and the education would increase understanding and hopefully avoid complaints.

The examination has shown that there are some existing educational programs that could be used to mainstream climate change knowledge into the tourism industry, but it is still clear that the tourism stakeholders still do not provide sufficient training for their staff or for the tourists. One reason could be the unavailability and unreliability of data about impacts on the tourism industry or Cambodia in general.

4.3.3. Co-operational and communicational Dimension

The examination above has shown that there are some tourism as well as climate change networks within Cambodia, but that they are currently not communicating with each other. There is also a dialogue between the MoT and the private sector, but here too climate change adaptation is not raised as a topic. Nonetheless, these networks provide a good basis for further cooperation within the tourism sector and they could become effective means of spreading climate change knowledge.

C 1 Disaster risk management co-ordination

The MoT has verbalised in their new development plan that there are no sufficient rescue mechanisms for tourists in the country. This realisation is the first step towards taking action and shows that the MoT is willing to improve in this field, but the dialogue towards this is still lacking. The expert from the tourism industry said that they “do have direct communication with the tourism ministry” (HT, p. 10), but that the exchange is mainly based on planning meetings about travel and trade affairs. There is no dialog about disaster management. He guesses that the reason lies in the fact that the incidents with foreign visitors in the country are not at a disaster level or life threatening (cf. HT, p. 10). The UNESCO said that there is a dialogue about disaster issues between the stakeholders in Siem Reap and that the Apsara Authority now officially declared a spokesperson who is in charge to communicate what Apsara is doing. Generally they underlined that “the key of the efficiency ... is the collaboration of the private sector and the authorities” (UO3, p. 9).

Apart from the efforts from the Apsara Authority there is no sign for co-ordination between the government and the tourism industry to improve their combined disaster preparedness.

C 2 Cost sharing

By taxing the tourism industry a low rate and from ineffective tax collection the Cambodian government loses a source of possible income that could be used for climate change adaptation. A few experts mentioned that tax collection is an issue in the country and they do not consider taxes as an appropriate way of sharing some adaptation costs. The expert from the tourism industry prefers to contribute to natural conservation through transparent and reliable NGOs (for example the Elephant Valley Project in Mondulkiri or Osmose in the bird sanctuary in Prek Toal) or other projects where he knows how their money is being used. Furthermore, he says that “contributing financially to the government is very risky because we are not sure how the money is used or where it goes” (HT, p. 10). They would prefer that the government either improves its performance and transparency or allocates fees for national parks, where it is clear that they are used for a specific climate change adaptation or conservation purpose (cf. HT, p. 11).

The UNESCO estimates that these kinds of fees or even voluntarily member fees for adaptation certificates, which the companies could use for marketing purposes, could be a possible way of participation of the private sector. They base their opinion on experiences with the project Heritage Watch where companies received a heritage friendly business certificate. Plenty of guesthouses, restaurants, and hotels freely participated in this initiative (cf. UO2, p.10). It can therefore be argued that there is currently no coordinated and communicated way of sharing adaptation or natural conservation costs within the tourism sector.

C 3 Conferences and Meetings

The tourism sector of Cambodia is meeting on various occasions during the year. The CATA (2011, [online]) is annually organising the ‘Cambodia Tourism Conference’ where key government officials and participants from the tourism industry come together. They also initiate ‘Advocacy Information Seminars’ on specific topics which concern the latest travel and tourism issues. The MoT is, according to their own expert, quite inactive in organising sector meetings (MT, p. 2). Nevertheless, there are some irregular topic specific meetings which are funded by NGOs or IGOs. Most of those meetings have been about ecotourism or sustainability. However, during those meetings there are discussions about climate change mitigation and carbon footprints, but so far there was no meeting or conference on climate change adaptation (cf. HT, p. 8).

Another platform is provided by the National Climate Change Network which organizes frequent meetings and seminars to disseminate new research findings (see appendix 8). Currently there are only IGOs and NGOs in this network, but it could be possible to use these gatherings to involve stakeholders from the tourism sector.

All these gatherings of the tourism sector could be possible hubs to initiate discussions about adaptation strategies and to provide the sector with reliable data about impact predictions. However, from this investigation it seems that there is limited exchange about climate change and none about climate change adaptation.

5. Conclusions

The investigation has shown that the tourism industry could face some significant impacts due to climate change. However, a variety of adaptation options for these upcoming challenges, as presented in the adaptation indicator catalogue, can be identified. The catalogue was divided into three dimensions to highlight the relevance of the adaptation options for the different stakeholders. The examination of existing adaptation strategies has shown that there are various institutions, policies, initiatives, and programs existing in the country that focus on climate change issues, but that almost none of these have considered the climate change impacts on tourism or the need for adaptation action in the tourism industry.

The tourism sector in Cambodia could face a wide range of climate related financial, ecological, and sociological impacts in the future. Although there is limited reliable data for long time weather and climate change impact predictions available a shifting climate could lead to three main impacts on the tourism sector. First, the industry faces an increased risk of extreme weather events, especially floods and droughts, which could destroy tourism infrastructure or make it impossible to visit specific regions. Second, increased operational costs, caused by higher insurance charges to cover the increased investments in adapting infrastructure. This includes for instance water management systems, and increased running costs from for example having to engage air-condition for longer and hotter dry seasons. Third, the country may experience a general decline in attractiveness as a tourism destination, e.g. through a reduced landscape aesthetic, loss of biodiversity or higher risks of infectious diseases. Besides these main impacts, other threats such as water quality issues, crime rates and social instabilities, as well as globally shifting tourism trends could influence the further development of Cambodia as a tourism destination.

The adaptation indicator catalogue provided a variety of adaptation options for each stakeholder involved and was effective in investigating existing adaptation strategies. The options were sorted into the governmental, tourism industry, and the co-operational and communicational dimension. The governmental dimension provided insight of what policies and regulations are needed, how and where adaptation planning could take place and how the programs may be implemented. The tourism industry dimension gave an idea of strategies and marketing, management, and program implementation in order to have a holistic adaptation strategy. The co-operational and communicational dimension focused on crisis management and DRM co-ordination, instruments of cost sharing, and examples of how the tourism sector as a whole could communicate effectively.

The investigation showed that the consideration of climate change impacts and necessary adaptation options in the Cambodian tourism sector is not sufficient. Some adaptation strategies are already being established in Cambodia and in the broader context they do affect and partly be related to the tourism sector, but the main stakeholders from the MoT and the tourism industry are just starting to realise the threat of changing climatic patterns for the future development of the sector. From this study it became clear that climate change awareness and adaptation activities are more comprehensive on the governmental dimension than in the tourism industry dimension or the co-operational and communicational dimension. Existing initiatives of climate change adaptation are mainly being initiated through the MoE, IGOs, such as UNESCO or UNDP, research institutes, such as SEI, or NGOs, such

as Pact. Nonetheless, one of the main findings of this research was the low level of awareness among governmental officials, as well as within the private sector, with regard to climate change, even though there are some educational and awareness raising programs for government officials, mainly initiated by UNDP in various programs. The MoT officials do not, apart from irregular participation in international conferences, have education programs for its staff. Within the tourism industry there is limited staff training or tourists' education about the issues. From this one can conclude that building climate change awareness would be one of the most important aspects for adaptation, as no action will be undertaken without knowledge about the issue. Although the government is already realising some policies and regulations that do focus on climate change adaptation, this investigation showed that these policies are often not enforced properly and that some experts consider them to be lacking in comprehensiveness. However, one promising policy is the current draft of the Law on Disaster Management, which specifically considers climate change adaptation. This certainly indicates that the government is on the right path towards creating a more comprehensive policy framework that considers climate change adaptation. Nevertheless, the current actual DRM suffers under poor organisation and planning. Since the floods during recent years there have been some improvements initiated, but there is a weak early warning system and unreliable weather forecasts that are the main hindering factors.

The overall coordination of the tourism sector is quite limited and mainly combines efforts to develop the sector, rather than considering the effects of such a rapid development or the climatic hazards for it. The main networks for communication in the country are the CATA and the Cambodian Hotel Association, which both organise frequent sector meetings. Other occasions where the sector meets are irregular conferences organised by the MoT (which is not often) or NGOs. Climate change has already been a topic on these meetings, but only from a mitigation perspective, while adaptation was hardly mentioned.

The investigation of the overall development planning and coordination of the tourism sector has shown that the government is not completely in control of the tourism sector and rather focused on favouring growth in the sector over properly regulating it. Investors can avoid building regulations and the private sector has been pumping water on their own behalf without any form of taxation. The water management is likely to become a major hazard as it can affect whole regions while water scarcity could become more of a problem with climate change. This could certainly impact the growth in the tourism sector.

Cost sharing of the government and the tourism industry is most likely possible through forms of fees or certificates. There is disagreement in the government as to how the money of taxation for climate change adaptation purposes would be used. Nevertheless, there is a trend to increase the general funding situation for climate change adaptation; in particular donation funds have been becoming increasingly available for this purpose.

There are some signs of product modifications of the tourism industry according to seasonal conditions. The Apsara Authority is working hard to steer visitor flows through the Angkor heritage park in order to avoid impacts of too many tourists on the site as well as to offer alternatives, if for example some temples need to be closed due to flooding. The government tries to encourage more visitors

from neighbouring countries or Arab regions to avoid a decrease of visitor numbers during the low season. However, the marketing of the sector has apart from ad-hoc modification during extreme weather events not considered changing climatic patterns.

The MoT has identified the importance of nature conservation for the future growth of the tourism sector. It is thought that conservation will also improve the resilience towards climate change impacts. There are some initiatives from the MoT and NGOs to conserve the natural ecosystems, but deforestation and disregard for building regulations are harming conservation efforts.

Another important finding is that there is a need for reliable regional and sectoral impact predictions. Climate change adaptation costs money, which the private sector is often not willing to invest as there still is a high uncertainty regarding the changing climate patterns. Additionally, the investigation has shown that the private sector does not receive new scientific reports. Similarly, the communication of the climatic findings to government officials is often complicated due to the complexity of reports and a language barrier. Nevertheless, there is some expertise within the government. The CCCD, the NCCC, and the NCDM are the main institutions with a sufficient knowledge about climate change to coordinate adaptation process, if they improve their effectiveness. The MoT itself has also a small committee, led by Mr. Neb Samouth, with a focus on climate change and tourism. The study could not estimate the effectiveness of this office, nonetheless, its mere existence indicated that the MoT has started to consider climate change impacts even if these have not been sufficiently mentioned in their new 2012-2020 development plan.

This study could provide an insight into the adaptation strategies taking place in Cambodia. The detailed situation analysis revealed that some actions to cope with climate change are already being undertaken in Cambodia, yet the tourism sector lags behind on climate change awareness and adaptation action.

6. Recommendations

The following chapter provides recommendations for the tourism sector of Cambodia to strengthen and further develop their already existing efforts aimed at adapting to climate change impacts. Because of the open nature of tourism an effective adaptation strategy for the sector would need a wide range of participating stakeholders. This includes institutions and companies that are regularly not in the first instance considered as belonging to the tourism sector, such as meteorological research entities.

The most important next steps could be:

Mainstream climate change adaptation knowledge throughout the tourism sector

In order to increase the awareness that the changing climate can negatively influence the tourism sector it will be important to inform all key stakeholders about the problem. The best platform to begin with would be a sector meeting or newsletters through the MoT, CATA, the Cambodian Hotel Association or comparable networks. Also joint events with the, or members of the, National Climate Change Network (NCCN) should be considered to include their expertises. However, this would only be the first step and further awareness and capacity building is necessary to mainstream climate change

adaptation and ensure that impacts are being considered in strategy, management, marketing or policy decisions.

Initiate further research of impacts on tourism to supply the sector with reliable data

The study has shown that there is a research gap on reliable climate predictions generally and impacts on the tourism industry and different regions in particular. It will be necessary to have some further studies to generate sufficient data to minimise the uncertainty of these impacts. The interviews with the tourism industry led to the conclusion that there is a will to take action, but there are also a number of factors preventing action, such as a lack of data and distrust towards the government. Therefore, the involvement of entities that most stakeholders trust is needed to communicate research results and assist adaptation processes.

Improve the disaster risk and crisis management of the public and private sector

The recent years have shown that the frequency of extreme weather events has increased. Even if these are not caused by climate change, they have shown that there is a need to improve the disaster risk management within Cambodia. In order to involve the tourism industry, someone within the NCDM could become responsible to communicate to and inform the private sector about crises. And furthermore create recommendation material how enterprises, can improve their crisis management.

Following steps could be:

Include climate change education in tourism professional training schools and universities

The Cambodian government is expecting to need 500.000 new tourism professionals by 2020 and intends to create a new training school. This school and already existing programs in universities or training schools provide an excellent platform to inform future staff of the tourism sector about climate change and its threats for the tourism sector.

Improve controlling mechanisms on water/waste management and building in vulnerable areas

The study has shown that bad water management could lead to significant problems in the future and that insufficiently planned building can increase the impacts of extreme weather events on tourism ventures. It is therefore important to initiate a stricter controlling mechanism on the tourism industry and to enforce regulations.

Install a transparent system of fees in national reserves for the tourism industry

The discussion suggested that transparency fees would be an appropriate instrument to involve the private sector in the cost of nature conservation. These fees should be raised in natural reserves and should only be spent on preserving these areas. The preservation of the landscapes should contribute to the attractiveness of the regions and should provide conditions for tourism to flourish.

Recommendations for further studies

Besides the lack of region specific impact predictions this study has shown that there is an information gap about initiatives within the tourism industry as well as about the exact work of the climate change committee of the MoT. Following studies could consider more empirical research with specific tourism representatives, such as accommodation suppliers from different regions of the country, different smaller and bigger tour operators, and other service suppliers.

7. Bibliography

Literature

- AKP (2010): Scoping Assessment for National Implementation in Cambodia: Summary October 2010. Bangkok: AIT-UNEP RRC.AP, p. VI, 4, 8.
- Alaerts, G.J., Blair, T.L., Hartvelt, F.J.A. (1991): A Strategy for Water Sector Capacity Building: Proceedings of the UNDP Symposium. New York: IHE, Delft, UNDP, (without page number).
- Babbie, Suzanne (2010): The practice of social research. Belmont: Wadsworth, p. 23, 131-132, 275, 394.
- Becken, Susanne & Hay, John E. (2007): Tourism and Climate Change: Risks and Opportunities. Clevedon: Channel View Publications, p. 1, 9-11, 85, 228, 230-231, 233, 301.
- Becken, Susanne & Hay, John E. (2012): Climate Change and Tourism: From policy to practice. New York: Routledge, p. 4, 33-34, 52, 56, 83-84.
- Brinkley, Joel (2011): *Cambodia's Curse: The Modern History of a troubled Land*. New York: Public Affairs, p. 4, 166, 219, 257.
- Botkosol, W.; Chanthou, C.; Ratha, K. V.; Sreang, B. K.; Kong, C.; Seiha, K.; Saing, S. (2010): The state of climate change management in Cambodia: Cambodia Water Partnership. Phnom Penh: Cambodia National Mekong Committee, p. 10-11.
- Brooks, Nick; Adger, W.; Neil & Kelly, P.; Mick (2005): The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation. Norwich: University of East Anglia, p. 153.
- Cambodia Development Research Institute (2002): The Impact of Flooding and Drought in Cambodia: Cambodia Development Review. Phnom Penh: Cambodia Development Research Institute, (without page number).
- Chheang, Vannarith (2011): Tourism Development in Cambodia: Opportunities for Japanese Companies. Bangkok: Institute of Developing Economies, Japan External Trade Organization, p. 13.
- Freyer, Walter (2006): Tourismus: Einführung in die Fremdenverkehrsökonomie. München: Oldenbourg, p. 45-47.
- Gardner, G.T., Stern, P.C. (1996): Environmental Problems and Human Behavior. Needham Heights: Allyn and Bacon, p. 23.
- Forsyth, Peter (2008): The Impact of Climate Change Policy on Competition in the Air Transport Industry. Clayton: Monash University, p. 7-9.
- Kapos, V., Ravilious, C., Leng, C., Bertzky, M., Osti, M., Clements, T., Dickson, B. (2010): Carbon, Biodiversity and Ecosystem Services: Exploring Co-benefits: Cambodia. Cambridge: UNEP-WCMC, p. 5, 11.

- Hall, C.M. & Coles, T. (2008): *International Business and Tourism: Global Issues, Contemporary Interactions*. London: Routledge, p. 1-26.
- Heyman, Eric & Härtel, Joachim (2011): *Emissions trading in aviation: Moderate burdens for the time being, perceptible competition effects*. Frankfurt: Deutsche Bank AG, p. 1.
- Higham, James & Hall, C. Michael (2005): *Making Tourism Sustainable: The Real Challenge of Climate Change*. In: Hall, C. Michael & Higham, James (ed.): *Tourism, Recreation and Climate Change*. Clevedon: Channel View Publications, p. 301.
- IPCC (2012): *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. New York: Cambridge University Press, p. 301.
- Lebel, L., Li, L., Krittasudthacheewa, C., Juntopas, M., Vijitpan, T., Uchiyama, T., Krawanchid, D. (2012): *Mainstreaming climate change adaptation into development planning*. Bangkok: Adaptation Knowledge Platform and Stockholm Environment Institute, p. 8.
- Long, Jonathan (2007): *Researching, Leisure, Sport and Tourism: The essential guide*. London: Sage Publications Ltd., p. 59, 76.
- Mason, J. (1996): *Qualitative Researching*. London: Sage Publications Ltd., p. 93-94.
- Mayring, Philipp (2002): *Einführung in die Qualitative Sozialforschung*. Weinheim & Basel: Beltz Verlag, p. 114-115.
- MoE & BBC World Service (2011): *Understanding Public Perceptions of Climate Change in Cambodia*. Phnom Penh: Ministry of Environment, p. ix-xi.
- MoE, GEF & UNDP (2005): *Vulnerability and Adaptation to Climate Hazards and to Climate Change: A Survey of Rural Cambodian Households*. Phnom Penh: MoE, p. 10, 21.
- MoE & UNDP (2011): *Cambodia Human Development Report 2010/2011: Building Resilience: The Future for Rural Livelihoods in the Face of Climate Change*. Phnom Penh: United Nations Development Program, p. 2, 7, 18-19, 43, 51-53, 65-67.
- MoE & UNESCAP (2009): *The National Green Growth Roadmap*. Phnom Penh: MoE, p. 3.
- MoT (2012a): *Tourism Development Strategic Plan 2012-2020*. Phnom Penh: MoT, p. 3-5, 8-9, 11, 18, 21, 27-28, 36.
- MoT (2012b): *Tourism Statistics Report in 2011*. Phnom Penh: Statistics and Tourism Information Department, p. 2, 4.
- Mundt, Jörn W. (2011): *Tourism and Sustainable Development: Reconsidering a Concept of Vague Policies*. Berlin: Erich Schmidt Verlag GmbH & Co. KG, p. 111.
- Myers, N., Mittermeier, R.A., Mittermeier, C.G., da Fonseca, G.A.B., Kent, J. (2000): *Biodiversity hotspots for conservation priorities*. *Nature*, p. 403.
- National Intelligence Council (2010): *Southeast Asia: The impact of Climate Change to 2030: Geopolitical Implications*. Bangkok: National Intelligence Council, p. 13, 15, 17, 20, 29, 48.
- NCDM (2002): *Disaster Management in Cambodia*. Phnom Penh: NCDM, (without page number).

- Oxfam Cambodia & Kyoto University (2008): Drought Management Considerations for Climate Change Adaptation: Focus on the Mekong Region. Kyoto: Kyoto University, p. 9.
- Patton, Michael Quinn (2002): Qualitative Research & Evaluation Methods. Thousand Oaks: Sage Publications, Inc., p. 4.
- Rogner, H.-H., Zhou, D., Bradley, R., Crabbé P., Edenhofer, O., Hare B. (Australia), Kuijpers, L., Yamaguchi, M., (2007): Mitigation: Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)]. Cambridge: Cambridge University Press, p. 101.
- San, Socheat L. (2005): Indicating Success: Evaluation of Community Protected Areas in Cambodia. Phnom Penh: Ministry of Environment, p. 1.
- Scott, D. & Jones, B. (2006): Climate change and sustainable tourism in the 21st century. In: Tourism Research: Policy, Planning, and Prospects. J. Cukier (ed.). Waterloo: Department of Geography Publication Series, University of Waterloo. p. 175-248.
- Simpson, M.C., Gössling, S., Scott, D., Hall, C.M. & Gladin, E. (2008): Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, Tools and Practices. France: UNEP, University of Oxford, UNWTO, WMO, p. 19, 30.
- UNDP (2011): Annual Report 2011: Cambodia. Phnom Penh: UNDP, p. 14.
- UNWTO (2012): Annual Report 2011. Madrid: World Tourism Organization, p. 2.
- UNWTO & UNEP (2008): Climate Change and Tourism: Responding to Global Challenges. Madrid: World Tourism Organisation, p. 31, 36-37, 61-62, 82, 84-86, 132.
- Veal, A.J. (2006): Research Methods for Leisure and Tourism: A Practical Guide. Harlow: Pearson Education Limited, p. 98-99, 107, 196-199.
- World Bank (2011): Vulnerability, Risk Reduction, and Adaptation to Climate Change: Cambodia. Washington: The World Bank Group, p. 2-4, 6.
- Yusuf & Francisco (2009): Climate Change Vulnerability Mapping for Southeast Asia. Singapore: Economy and Environment Program for Southeast Asia, p. 10-11.

Internet

- 4 Rivers Floating Lodge (2009): Concept: Symbiosis is the Key. [online] URL: <http://www.ecolodges.asia/en/the-concept.html> [accessed November 02, 2012].
- Australian Government, Department of Climate Change and Energy Efficiency (2012): Emissions trading schemes by country. [online] URL: <http://www.climatechange.gov.au/government/international/global-action-facts-and-fiction/ets-by-country.aspx> [accessed October 10, 2012].

- Auswärtiges Amt (2012a): Kambodscha. [online] URL: http://www.auswaertiges-amt.de/DE/Aussenpolitik/Laender/Laenderinfos/01-Nodes_Uebersichtsseiten/Kambodscha_node.html [accessed September 18, 2012].
- Auswärtiges Amt (2012b): Kambodscha: Wirtschaft. [online] URL: http://www.auswaertiges-amt.de/sid_A4CDB621E094EC2230BB6AA8B090AFF8/DE/Aussenpolitik/Laender/Laenderinfos/Kambodscha/Wirtschaft_node.html [accessed September 18, 2012].
- Auswärtiges Amt (2012c): Kambodscha: Reise- und Sicherheitshinweise. [online] URL: <http://www.auswaertiges-amt.de/DE/Laenderinformationen/00-SiHi/KambodschaSicherheit.html> [accessed September 18, 2012].
- BBC (2011): Thailand and Cambodia reach deal on temple border. [online] URL: <http://www.bbc.co.uk/news/world-asia-pacific-16294309> [accessed September 19, 2012].
- CATA (2011): CATA Activities. [online] URL: http://www.catacambodia.com/cata_activities.php [accessed October 27, 2012].
- Cambodian Embassy (2012): Constitution of the Kingdom of Cambodia. [online] URL: http://www.cambodianembassy.org.uk/index_main.php?lang=&mc=2&menu=9&k=1&menu1=2 [accessed October 22, 2012].
- ConCERT (2012a): Siem Reap Projects. [online] URL: http://www.concertcambodia.org/siem_reap_organisations.aspx [accessed October 11, 2012].
- ConCERT (2012b): Siem Reap Projects. [online] URL: <http://www.concertcambodia.org/businesspartner.aspx?type=1> [accessed October 11, 2012].
- ConCERT (2012c): Siem Reap Projects. [online] URL: <http://www.concertcambodia.org/businesspartner.aspx?type=2> [accessed October 11, 2012].
- ConCERT (2012d): Siem Reap Projects. [online] URL: <http://www.concertcambodia.org/businesspartner.aspx?type=3> [accessed October 11, 2012].
- ConCERT (2012e): Siem Reap Projects. [online] URL: <http://www.concertcambodia.org/businesspartner.aspx?type=4> [accessed October 11, 2012].
- Fox News (2011): Choppers rescue tourists caught by Cambodian flood. [online] URL: <http://www.foxnews.com/world/2011/09/22/choppers-rescue-tourists-caught-by-cambodian-flood/> [accessed September 16, 2012].
- Hanuman Tourism (2012): Welcome to Hanuman Tourism – Voyages. [online] URL: <http://www.hanumantourism.com/profile.html> [accessed October 11, 2012].
- IPCC (2007): IPCC Fourth Assessment Report: Climate Change 2007. [online] URL: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/tssts-4-1.html [accessed October 15, 2012].
- MoE (2012): Turning Climate Change into Opportunities. [online] URL: <http://www.camclimate.org.kh/index.php?page=detail&matc=&satc=atc24&article=atc24&lang=en> [accessed September 20, 2012].

- MoT (2012): The Ministry of Cambodia. [online] URL: http://www.tourismcambodia.org/mot/index.php?view=mot_cambodia#comp [accessed October 11, 2012].
- Open Development Cambodia (2012): Laws & Regulations. [online] URL: <http://www.opendevdevelopmentcambodia.net/laws-regulations/#> [accessed October 22, 2012].
- Pact (2012): SEA Change: Monitoring and Evaluation for Climate Change Interventions. [online] URL: http://www.pactworld.org/cs/cambodia/sea_change_monitoring_and_evaluation_for_climate_change_interventions [accessed October 25, 2012].
- RCCDM (2012): Documents & Publications. [online] URL: http://www.rccdm.net/index.php?option=com_docman&task=doc_download&gid=180&Itemid=215 [accessed October 22, 2012].
- SEI (2012): SEI at a glance. [online] URL: <http://www.sei-international.org/about-sei> [accessed October 11, 2012].
- Transparency International (2012): Corruption Perceptions Index 2011. [online] URL: <http://cpi.transparency.org/cpi2011/results/#CountryResults> [accessed September 18, 2012].
- UNDP (2012a): Cambodia – Country Profile: Human Development Index. [online] URL: <http://hdrstats.undp.org/en/countries/profiles/KHM.html> [accessed September 20, 2012].
- UNDP (2012b): Overview. [online] URL: <http://www.undp.org/content/undp/en/home/ourwork/overview.html> [accessed October 11, 2012].
- UNDP (2012c): The Angkor Heritage Management Framework (Australian Funds-In Trust and the Royal Government of Cambodia). [online] URL: <http://www.unesco.org/new/en/phnompenh/culture/tangible-heritage/the-angkor-heritage-management-framework/> [accessed October 23, 2012].
- UNFCCC (2012): Clean Development Mechanism (CDM). [online] URL: http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php [accessed October 23, 2012].
- UNESCO (2012): Introducing UNESCO: what we are. [online] URL: <http://www.unesco.org/new/en/unesco/about-us/who-we-are/introducing-unesco/> [accessed October 11, 2012].
- UNWTO (2008): Understanding Tourism: Basic Glossary. [online] URL: <http://media.unwto.org/en/content/understanding-tourism-basic-glossary> [accessed September 15, 2012].
- UNWTO (2012): Who we are. [online] URL: <http://www2.unwto.org/en/content/who-we-are-0> [accessed September 16, 2012].
- UNFCCC (1992): United Nations Framework Convention on Climate Change. [online] URL: <http://unfccc.int/resource/docs/convkp/conveng.pdf> [accessed September 21, 2012].

World Bank (2011): Transport in Cambodia. [online] URL: <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPTRANSPORT/0,,contentMDK:20458706~menuPK:2066305~pagePK:34004173~piPK:34003707~theSitePK:574066,00.html> [accessed September 18, 2012].

World Bank (2012a): Cambodia Dashboard: Climate Future. [online] URL: http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=KHM&ThisTab=ClimateFuture [accessed September 26, 2012].

World Bank (2012b): Cambodia Dashboard: Adaptation. [online] URL: http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=KHM&ThisTab=Adaptation [accessed September 26, 2012].

World Bank (2012c): Cambodia Dashboard: Natural Hazards. [online] URL: http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=KHM&ThisTab=NaturalHazards [accessed September 26, 2012].

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Appendix 1: General questions overview

Each of the six interviews had specific questions regarding their work and a variety of questions according to their field of expertise from the list of questions below. The whole list of questions below is constructed to receive comprehensive answers to mostly all indicators of the adaptation-indicator catalogue:

2. Governmental dimension

- 2.1 [] What possibilities are there to improve the current climate change adaptation policy of Cambodia in order to sufficiently face the upcoming challenges?
- 2.2 [] The Cambodian government implemented in 2003 the Cambodian Climate Change Office (CCCCO, later upgraded to the Cambodian Climate Change Department) and the National Climate Change Committee (NCCC) in 2006. What practical adaptation strategies or projects were implemented through these institutions and how effective are these strategies or projects?
- 2.3 [] One of the main duties of the CCCCCO is to co-ordinate action related to climate change and communicate knowledge about it to and between different stakeholders. What are the strength and weaknesses of the work aimed to manage the difficult task of coordinating and networking the large variety of involved stakeholders?
- 2.4 [] The National Adaptation Program of Action to Climate Change (NAPA) highlighted in 2006, that limited financial resources are a main barrier for climate change adaptation. What is your view on the funding situation for climate change adaptation in Cambodia?
- 2.5 [] The tourism industry in Cambodia is a booming sector. How would you estimate the effectiveness of the government to steer such development processes?
- 2.6 [] The flooding in 2011 caused significant damage to Cambodia. The tourism industry was hit by spring floods that led to a helicopter rescue of 200 tourists who were trapped in the Bantey Srei temple complex. What are the government plans to avoid surprising catastrophes in the future?
- 2.7 [] What are the developments in the Cambodian monitoring programs of estimated climate change impacts, e.g. coastal erosion?
- 2.8 [] In which ways can the governmental management of disasters and risks, specifically in tourism destinations, be improved?
- 2.9 [] How, when at all, does the development planning of tourism destinations consider estimated climate change impacts through building regulations?
- 2.10 [] How aware are decision makers in Cambodia of climate change and its estimated impacts on the country? (Follow up question: What kind of educational programs are implemented?)

- 2.11 [] What, from your point of view, are the research gaps regarding climate change issues in Cambodia?
- 2.12 [] Which, if any, climate change impacts are influencing the country's marketing as a whole?
- 2.13 [] The natural resources (e.g. national parks and ecosystems) of Cambodia are a significant "selling aspect" as a tourism destination as a whole. Climate change can negatively impact these natural systems. What does the government do to protect its natural resources?

3. Tourism industry dimension

- 3.1 [] How, if at all, are customers and staff-members informed about climate change impacts affecting their stay in the country?
- 3.2 [] Which forms of product or services (tourism related) modification already taken place in Cambodia, are from your point of view, climate related?
- 3.3 [] When considering different regions and businesses within the tourism industry, where do low season closures take place?
- 3.4 [] The flooding in 2011 caused significant damage to Cambodia. The tourism industry was hit by spring floods that led to a helicopter rescue of 200 tourists who were trapped in the Bantey Srei temple complex. What, if any, form of marketing was used by the tourism industry to avoid losses of visitor numbers during and after the flood?
- 3.5 [] In which way, if at all, do insurance companies in Cambodia react to increased risks through climate change impacts, such as more frequent flooding and droughts?
- 3.6 [] How would you estimate the effectiveness of crisis management by tour operators and accommodation suppliers in Cambodia?
- 3.7 [] Increased drought frequencies in Cambodia can lead to water scarcity. In what way does the tourism industry react to the threat of insufficient water supplies?
- 3.8 [] The tourism destinations throughout Cambodia are rapidly developing. How, if at all, does the industry consider climate change impacts for new building projects?

4. Co-operational & communicational dimension

- 4.1 [] Most impacts influence common goods and the responsibility for them often remains solely with the government. The tourism industry is benefitting from the common goods, such as preserved nature, often without contributing to the cost to sustain them. How important is it from your point of view that the adaptation costs should be divided by different stakeholders?
- 4.2 [] What would be a suitable instrument for a cost division?

- 4.3 [] In order to ensure an efficient functioning disaster risk management it is necessary that different stakeholders, institutions, and projects are interlinked and coordinated. How is the crisis management of the tourism industry linked to the governmental disaster risk management?
- 4.4 [] How is the Cambodian tourism sector as a total connected. Are there regular sector meetings, tourism networks, or conferences?
- 4.5 [] In which way, if at all, has the adaptation to climate change impacts been an issue on previous tourism industry sector meetings?

5. Further in-depth questions

5.1 [] ???

5.2 [] ???

Appendix 2: Questionnaire UNESCO

Interview with (UO1) Philippe Delanghe (Culture Program Specialist, Culture Unit, at UNESCO) (UO2) Blaise Kilian (Program Coordinator, Culture Unit, at UNESCO), (UO3) Bun Hok Lim (Program Officer, Culture Unit, at UNESCO).

Date: 11, September 2012

Place: Phnom Penh, Cambodia

1. UNESCO General

- 1.1 [] The UNESCO Phnom Penh website says that the UNESCO is fostering policies and capacity building in science, technology, and innovation for sustainable development. What climate change adaptation related programs and projects do the UNESCO currently runs?
- 1.2 [] The UNESCO has some educational programs regarding climate change issues. How is, in your experience, the existing awareness of climate change among governmental officials and other decision makers in Cambodia?
- 1.3 [] How would you estimate the adaptive capacity to climate change impact of the tourism industry depending on the Cultural World Heritage Site of Angkor?
- 1.4 [] The “Siem Reap Water Working Group” of the UNESCO is working for the protection from floods and droughts and the conservation of water resources. What experiences did the workgroup make with the water management of tourism businesses in Siem Reap?

2. Governmental dimension

- 2.2 [] The Cambodian government implemented in 2003 the Cambodian Climate Change Office (CCCO) and the National Climate Change Committee (NCCC) in 2006. What practical adaptation strategies or projects were implemented through these institutions and how effective are these strategies or projects?
- 2.3 [] One of the main duties of the CCCO is to co-ordinate action related to climate change and communicate knowledge about it to and between different stakeholders. What are the strength and weaknesses of the work aimed to manage the difficult task of coordinating and networking the large variety of involved stakeholders?
- 2.4 [] The National Adaptation Program of Action to Climate Change (NAPA) highlighted in 2006, that limited financial resources are a main barrier for climate change adaptation. What is your view on the funding situation for climate change adaptation in Cambodia?
- 2.5 [] The tourism industry in Cambodia is a booming sector. How would you estimate the effectiveness of the government to steer such development processes?
- 2.9 [] How, when at all, does the development planning of tourism destinations consider estimated climate change impacts through building regulations?
- 2.6 [] The flooding in 2011 caused significant damage to Cambodia. The tourism industry was hit by spring floods that led to a helicopter rescue of 200 tourists who were trapped in the Bantey Srei temple complex. What are the government plans to avoid surprising catastrophes in the future?
- 2.7 [] What are the developments in the Cambodian monitoring programs of estimated climate change impacts, e.g. coastal erosion?
- 2.11 [] What, from your point of view, are the research gaps regarding climate change issues in Cambodia?

3. Tourism industry dimension

- 3.1 [] How would you estimate the effectiveness of crisis management by tour operators and accommodation suppliers in Cambodia?
- 3.8 [] The tourism destinations throughout Cambodia are rapidly developing. How, if at all, does the industry consider climate change impacts for new building projects?

4. Co-operational & communicational dimension

- 4.1 [] Most impacts influence common goods and the responsibility for them often remains solely with the government. The tourism industry is benefitting from the common goods, such as preserved nature, often without contributing to the cost to sustain them. How important is it,

from your point of view, that the adaptation costs should be divided by different stakeholders?

4.2 [] What would be a suitable instrument for a cost division?

5. Further in-depth questions

5.1 [] ???

5.2 [] ???

Appendix 3: Questionnaire MoT

Interview with Sok Sokun (Director of Planning and Development Department of the Cambodian Ministry of Tourism)

Date: 12, September 2012

Place: Phnom Penh, Cambodia

1. Ministry of tourism General

1.1 [] The Cambodian Ministry of Environment is concerned with climate change since 2003. How, would you estimate the awareness of climate change issues among officials in the Ministry of Tourism?

1.2 [] What kind of, if at all, educational programs about climate change does/did the Ministry of Tourism do for its staff members?

1.3 [] The Ministry of Tourism is the main institution to steer regional tourism development. In which way, when at all, do you consider climate change impacts in your development planning processes?

1.4 [] The natural resources (e.g. national parks and ecosystems) of Cambodia are a significant “selling aspect” for the country as a tourism destination. Climate change can negatively impact these natural systems. What does the Ministry of Tourism in cooperation with other ministries do to protect its natural resources?

2. Governmental dimension

2.1 [] What possibilities are there to improve the current climate change adaptation policy of Cambodia in order to sufficiently face the upcoming challenges?

- 2.4 [] The National Adaptation Program of Action to Climate Change (NAPA) highlighted in 2006, that limited financial resources are a main barrier for climate change adaptation. What is your view on the funding situation for climate change adaptation in Cambodia?
- 2.8 [] In which ways can the management of disasters and risks, specifically in tourism destinations, be improved?
- 2.12 [] Which, if any, climate change impacts are influencing the country's marketing as a whole?

3. Tourism industry dimension

- 3.4 [] The flooding in 2011 caused significant damage to Cambodia. The tourism industry was hit by spring floods that led to a helicopter rescue of 200 tourists who were trapped in the Bantey Srei temple complex. What, if any, form of marketing was used by the tourism industry to avoid losses of visitor numbers during and after the flood?
- 3.2 [] Which forms of product or services (tourism related) modification already taken place in Cambodia, are from your point of view, climate related?
- 3.5 [] In which way, if at all, do insurance companies in Cambodia react to increased risks through climate change impacts, such as more frequent flooding and droughts?
- 3.6 [] How would you estimate the effectiveness of crisis management by tour operators and accommodation suppliers in Cambodia?
- 3.8 [] The tourism destinations throughout Cambodia are rapidly developing. How, if at all, does the industry consider climate change impacts for new building projects?

4. Co-operational & communicational dimension

- 4.1 [] Most impacts influence common goods and the responsibility for them often remains solely with the government. The tourism industry is benefitting from the common goods, such as preserved nature, often without contributing to the cost to sustain them. How important is it from your point of view that the adaptation costs should be divided by different stakeholders?
- 4.2 [] What would be a suitable instrument for a cost division?
- 4.3 [] In order to ensure an efficient functioning disaster risk management it is necessary that different stakeholders, institutions, and projects are interlinked and coordinated. How is the crisis management of the tourism industry linked to the governmental disaster risk management?
- 4.4 [] How is the Cambodian tourism sector as a total connected. Are there regular sector meetings, tourism networks, or conferences?
- 4.5 [] In which way, if at all, has the adaptation to climate change impacts been an issue on previous tourism industry sector meetings?

5. Further in-depth questions

5.1 [] ???

5.2 [] ???

Appendix 4: Questionnaire Hanuman Tourism

Interview with Nick Ray (Company advisor of Hanuman tourism and Author for the Lonely Planet)

Date: 12, September 2012

Place: Phnom Penh, Cambodia

1. Hanuman General

1.1 [] Is Hanuman Tourism considering climate change impacts in their service and product planning processes?

1.2 [] Hanuman is one of Cambodia's longest operating tour operator. Which kind of climatic changes could you experience in the past which influenced the tourism in the country as a whole?

1.3 [] How would you estimate the awareness of climate change impacts throughout the tourism industry in Cambodia?

2. Governmental dimension

2.5 [] The tourism industry in Cambodia is a booming sector. How would you estimate the effectiveness of the government to steer such development processes?

2.8 [] In which ways can the governmental management of disasters and risks, specifically in tourism destinations, be improved?

1.12 [] Which, if any, climate change impacts are influencing the country's marketing as a whole?

3. Tourism industry dimension

3.1 [] How, if at all, are customers and staff-members informed about climate change impacts affecting their stay in the country?

3.2 [] Which forms of product or services (tourism related) modification already taken place in Cambodia, are from your point of view, climate related?

3.3 [] When considering different regions and businesses within the tourism industry, where do low season closures take place?

3.4 [] The flooding in 2011 caused significant damage to Cambodia. The tourism industry was hit by spring floods that led to a helicopter rescue of 200 tourists who were trapped in the Banteay Srei temple complex. What, if any, form of marketing was used by the tourism industry to avoid losses of visitor numbers during and after the flood?

3.5 [] In which way, if at all, do insurance companies in Cambodia react to increased risks through climate change impacts, such as more frequent flooding and droughts?

4. Co-operational & communicational dimension

4.1 [] Most impacts influence common goods and the responsibility for them often remains solely with the government. The tourism industry is benefitting from the common goods, such as preserved nature, often without contributing to the cost to sustain them. How important is it from your point of view that the adaptation costs should be divided by different stakeholders?

4.2 [] What would be a suitable instrument for a cost division?

4.3 [] In order to ensure an efficient functioning disaster risk management it is necessary that different stakeholders, institutions, and projects are interlinked and coordinated. How is the crisis management of the tourism industry linked to the governmental disaster risk management?

4.4 [] How is the Cambodian tourism sector as a total connected. Are there regular sector meetings, tourism networks, or conferences?

4.5 [] In which way, if at all, has the adaptation to climate change impacts been an issue on previous tourism industry sector meetings?

5. Further in-depth questions

5.1 [] ???

5.2 [] ???

Appendix 5: Questionnaire ConCERT

Interview with Michael Horton (Chairman and Founder of ConCERT)

Date: 18, September 2012

Place: Siem Reap, Cambodia

1. ConCERT General

- 1.1 [] ConCERT is working together with a long list of accommodation suppliers, restaurants, and tour operators. How is, in your experience, the existing awareness of climate change among your partner organisations?
- 1.2 [] How would you estimate the adaptive capacity to climate change impacts, including natural catastrophes, of the tourism industry depending on the Siem Reap region?

2. Governmental dimension

- 2.5 [] The tourism industry in Cambodia is a booming sector. How would you estimate the effectiveness of the government to steer such development processes?
- 2.6 [] The flooding in 2011 caused significant damage to Cambodia. The tourism industry was hit by spring floods that led to a helicopter rescue of 200 tourists who were trapped in the BanteySrei temple complex. What are the government plans to avoid surprising catastrophes in the future?
- 2.7 [] What are the developments in the Cambodian monitoring programs of estimated climate change impacts, e.g. coastal erosion?
- 2.11 [] What, from your point of view, are the research gaps regarding climate change issues in Cambodia?
- 2.13 [] The natural resources (e.g. national parks and ecosystems) of Cambodia are a significant “selling aspect” as a tourism destination as a whole. Climate change can negatively impact these natural systems. What does the government do to protect its natural resources?

3. Tourism industry dimension

- 3.1 [] How, if at all, are customers and staff-members informed about climate change impacts affecting their stay in the country?
- 3.2 [] Which forms of product or services (tourism related) modification already taken place in Cambodia, are from your point of view, climate related?
- 3.3 [] When considering different regions and businesses within the tourism industry, where do low season closures take place?
- 3.6 [] How would you estimate the effectiveness of crisis management by tour operators and accommodation suppliers in Cambodia?

4. Co-operational & communicational dimension

- 4.3 [] In order to ensure an efficient functioning disaster risk management it is necessary that different stakeholders, institutions, and projects are interlinked and coordinated. How is the crisis management of the tourism industry linked to the governmental disaster risk management?
- 4.4 [] How is the Cambodian tourism sector as a total connected. Are there regular sector meetings, tourism networks, or conferences?
- 4.5 [] In which way, if at all, has the adaptation to climate change impacts been an issue on previous tourism industry sector meetings?

5. Further in-depth questions

- 5.1 [] ???
- 5.2 [] ???

Appendix 6: Questionnaire SEI

Interview with Albert M. Salamanca Ph.D. (Research Fellow at the Stockholm Environment Institute-Asia)

Date: 19, September 2012

Place: Bangkok, Thailand

1. SEI Asia General

- 1.1 [] The “Regional Climate Change Adaptation Knowledge Platform” of SEI Asia is listing Cambodia in its geographical scope. In how far have been Cambodian stakeholders been involved in the platform since its establishment?
- 1.2 [] The SEI Asia has advised and supported the Thai government on climate change adaptation issues. Which obstacles have occurred within the adaptation processes? Do you think Cambodia could face similar harming factors?

2. Governmental dimension

- 2.4 [] What is your view on the funding situation for climate change adaptation in Cambodia?

- 2.7 [] What are the developments in the Cambodian monitoring programs of estimated climate change impacts, e.g. coastal erosion?
- 2.8 [] In which ways can the governmental management of disasters and risks, specifically in tourism destinations, be improved?
- 2.11 [] What, from your point of view, are the research gaps regarding climate change issues in Cambodia?

3. Tourism industry dimension

- 3.5 [] In which way, if at all, do insurance companies in Cambodia react to increased risks through climate change impacts, such as more frequent flooding and droughts?

4. Co-operational & communicational dimension

- 4.1 [] Most impacts influence common goods and the responsibility for them often remains solely with the government. The tourism industry is benefitting from the common goods, such as preserved nature, often without contributing to the cost to sustain them. How important is it from your point of view that the adaptation costs should be divided by different stakeholders?
- 4.2 [] What would be a suitable instrument for a cost division?

5. Further in-depth questions

- 5.1 [] ???
- 5.2 [] ???

Appendix 7: Questionnaire UNDP

Interview with Phearnich Hing (Climate Change Policy Analyst at UNDP)

Date: 20, September 2012

Place: Bangkok, Thailand / Phnom Penh, Cambodia (Skype interview)

1. UNDP General

- 1.1 [] The UNDP website says that it supports coordination and partnership building among a wide range of stakeholders in Cambodia to face climate change. What climate change adaptation related educational programs and cooperation projects do the UNDP currently runs?

2. Governmental dimension

- 2.2 [] The Cambodian government implemented in 2003 the Cambodian Climate Change Office (CCCO) (later upgraded to the CCCD) and the National Climate Change Committee (NCCC) in 2006. What practical adaptation strategies or projects were implemented through these institutions and how effective are these strategies or projects?
- 2.3 [] One of the main duties of the CCCO is to co-ordinate action related to climate change and communicate knowledge about it to and between different stakeholders. What are the strength and weaknesses of the work aimed to manage the difficult task of coordinating and networking the large variety of involved stakeholders?
- 2.1 [] What possibilities are there to improve the current climate change adaptation policy of Cambodia in order to sufficiently face the upcoming challenges?
- 2.4 [] The National Adaptation Program of Action to Climate Change (NAPA) highlighted in 2006, that limited financial resources are a main barrier for climate change adaptation. On the UNDP website you are mentioning that there is/will be sa increasing amount of development assistance and various financing schemes are being made available for Cambodia. What is your view on the current funding situation for climate change adaptation in Cambodia?
- 2.6 [] The flooding in 2011 caused significant damage to Cambodia. The tourism industry was hit by spring floods that led to a helicopter rescue of 200 tourists who were trapped in the Bantey Srei temple complex. What are the government plans to avoid surprising catastrophes in the future?
- 2.8 [] In which ways can the governmental management or disasters and risks, specifically in tourism destinations, be improved?
- 2.7 [] What are the developments in the Cambodian monitoring programs of estimated climate change impacts, e.g. coastal erosion?
- 2.11 [] What, from your point of view, are the research gaps regarding climate change issues in Cambodia?

5. Further in-depth questions

- 5.1 [] ???
- 5.2 [] ???

Appendix 8: National Climate Change Network in Cambodia (Flyer)

National Climate Change Network in Cambodia (NCCN)



Mission Statement

The mission of the National Climate Change Network in Cambodia is to reduce the severity of climate change impacts by encouraging coordination and communication among stakeholders.

1. BACKGROUND

Climate change poses a real threat to the world's poorest people, particularly when it comes to their ability to earn a living and feed their families. The Climate change hits poor people first and worst because of the places where they live, the quality of their housing, and their dependence on the land and agriculture. Climate change has recently been added to the development agenda within Cambodia's government and the governments of other countries, and has been made a priority among academics and NGOs.

Cambodia is one of the most vulnerable countries to climate change due to a combination of its climate-related natural hazards and low adaptive capacity. The combination of these two factors, as well as low public awareness, creates a pressing concern among NGOs and the Cambodian government.

NGOs have a key role and responsibility to push for changes and to be a strong voice in setting the agenda for this crucial issue.

2. RATIONALE

Climate change impacts are already happening and can't be avoided. Immediate actions by all stakeholders including NGOs must be taken in order to reduce the ramifications of the climate crisis.

We must overcome low public awareness among organizations. We must also overcome poor coordination between donors, NGOs, researchers, and government representatives, which has weakened the efforts of NGOs to raise awareness about and action around climate change.

With an aim of addressing this problem, a **National Climate Change Network (NCCN) in Cambodia** has come together to advance work around reducing climate change in Cambodia.

NGOs have a key role and responsibility to push for positive changes and to be a strong voice in setting the agenda for climate change response including through funding, implementation, and research.

3. OBJECTIVES

Overall objective: To develop capacity among stakeholders in climate control-related issues in Cambodia.

Objective 1: Provide information-sharing and capacity building among network members

Objective 2: Improve coordination on climate control actions among NGOs

Objective 3: Create public awareness and participation concerning climate change

Objective 4: Improve the dialogue between donors, private sector stakeholders, academic institutions and the government

Objective 5: Influence the climate change agenda using a bottom-up approach

4. ACTIVITIES

Objective 1: Provide information-sharing and capacity building among network members.

Activities:

- Dissemination of research through information and technology transfer at regular meetings, seminars, and workshops for network members



NCCN members attended toktok event at Wat Phnom

5. STRUCTURE

Membership

The membership will be open to all NGOs with activities in Cambodia.

Current Participants:

WWF, CEDAC, GERES, UNDP, Star Kampuchea, LWF, CARE, Sarika radio, Miup Baitong, RUPP, Vigilance, Plan Cambodia, HBF, EC, FFI, OPC, Action Aid, Fact, Pact, Oxfam Hong Kong, WVC, Kamworks, CRS, LOCAB, EWMI, CORD, KYSD, Fauna & Flora International, PNSA, Women Media Center, World Vision, VFC, GAPE, BGV and Asia Foundation.

Coordinating Team

The network has a coordination team consisting of representatives from six organizations: SCW, DPA, OA, DCA/CA, NGO Forum and Forum Syd.

The responsibilities of the coordination team include but are not limited to:

- Coordinating, planning, and hosting the meetings
- Facilitating the development of a roadmap
- Facilitating information-sharing and decision-making on critical issues -- including media correspondence and budget -- among all members

Objective 4: Improve dialogue between donors, private sector stakeholders, academic institutions and the government

Activities:

- Participate in national and international conferences
- Organize seminars, workshops, and conferences for policy makers and implementers



NCCN members joined a conference on CC

- Influence policy makers to mainstream climate control and to formulate climate control policies
- Support appropriate government projects with technical and financial assistance
- Monitor the dissemination of climate control funds and coordination implementation between donors, private sector stakeholders, academic institutions, and government agencies

- Share knowledge and practical experiences of adaptation and mitigation practices among network members by encouraging discussions and communication exchanges
- Coordinate the climate change agenda at the national and international level, and share information within the network via a mailing list/homepage

Objective 2: Improve coordination on climate control actions among NGOs

Activities:

- Regular meetings where experiences, knowledge and activities are exchanged among NGOs
- Mapping of NGOs' climate change activities in Cambodia
- Facilitate cooperation between NGOs



TokTok Event at Wat Buton Vortei Park

6. FUNDING SUPPORT

Contribution of the network members is the main source of funding for the network

Contact person:

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Leaflet is prepared and funded by Oxfam America

Objective 5: Influence the climate change agenda using a bottom-up approach

Activities:

- Study and document climate control at the grass roots level
- Support and initiate research focusing on climate change consequences for the Cambodian people
- Support and facilitate meetings between communities and policy makers

Objective 3: Create public awareness and participation concerning climate change

Activities:

- Organize conferences, workshops, and seminars for the public and NGOs
- Awareness creation through various forms of media
- Promoting information campaigns among the public
- Facilitate public input to the network

Bachelor's thesis statement of originality

I hereby confirm that I have written the accompanying thesis by myself, without contributions from any sources other than those cited in the text and acknowledgements.

This applies also to all graphics, drawings, maps, and images included in this thesis.

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Place and date

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Signature