

Master's thesis



The Exploitation versus Conservation Dilemma

**Preparative Research towards a Comprehensive and
Extensive Environmental & Social Impact Assessment –
Koh Rong Archipelago, Cambodia**

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The Exploitation versus Conservation Dilemma: Preparative Research towards a Comprehensive and Extensive Environmental & Social Impact Assessment– Koh Rong Archipelago, Cambodia

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Declaration

I hereby confirm that I am the sole author of this thesis and it is a product of my own academic research.

Student's name

Abstract

Following years of civil war and economic stagnation in the late twentieth century, Cambodia's strong commitment to economic development today often collides with introduced measures of environmental protection, resulting in frequently occurring interest conflicts of exploitation versus conservation. By conducting a preparative research towards a comprehensive and extensive Environmental and Social Impact Assessment of a planned tourism development project within a proposed Marine Protected Area, the presented study provides evidence of a particularly distinct dilemma of exploitation versus conservation. By applying methods of qualitative data collection in combination with the review of documents, the researcher identified potential environmental and social impacts related to the planned development. A lack of communication between the stakeholders was found to be the main reason for the estimated unwanted consequences, presumably resulting in major implementation setbacks of both development and conservation project. The researcher found that a revision of the development plan and the conservation plan under the consideration of the study's findings could lead to future mutual conservation-development benefits as well as to an improvement of the local population's livelihood-situation. Furthermore, the study identified the tool of Environmental and Social Impact Assessment as a suitable instrument of linking the conservationists' and the developers' interests.

Foreword

Benefitting from the position of being born and raised in the comfort and safety of a developed country, I had the possibility to enter higher education and pursue my personal interest in the field of environmental related studies. Growing up and having access to all necessary information needed to take a look at the bigger picture, I had the chance to consider further subjects beyond my country's borders. This widened my field of local related topics to international and complex issues, affecting environment and populations of other countries, especially of those countries on whose shoulders the life in comfort and security I grew up with in my developed home country is often pressing on.

Throughout my study career and repeated involvements in environmental projects in Cambodia and its neighbour countries, I developed a strong interest for the country's culture, history and environment. Inevitably, I found myself relatively quickly confronted with the numerous problems and conflicts that Cambodia is facing in its rush to catch up with its dynamic Southeast Asian neighbourhood and its effort to raise from one of the poorest countries in the world to a stable and internationally respected economic power. The most prevailing issue that I observed throughout the time in Cambodia is the conflict between ideas of resource use, involving a number of trade-offs explained in this study. I have seen different cases in which long-term efforts, work and commitment went completely in vain, resulting in failed and abandoned projects caused by the uncertainty of exploitation or conservation. Depending on the situation, it seems for the most part to be an unintentional disinformation of stakeholder and decision-maker regarding the full range of impacts and consequences of a proposed action, which leads to unnecessary waste of committed effort on both sides, the exploiter and the conservationist.

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Abbreviations

CBRE Cambodia	CB Richard Ellis (Cambodia) Co., Ltd.
CCC	Coral Cay Conservation
CFi	Community Fishery
EIA	Environmental Impact Assessment
ELC	Economic Land Concession
ESIA	Environmental and Social Impact Assessment
FDI	Foreign Direct Investments
FiA	Fisheries Administration
GDP	Gross Domestic Product
IUCN	International Union for the Conservation of Nature
KRA-MFMA	Koh Rong Archipelago Marine Fisheries Management Area
LICADHO	Cambodian League for the Promotion and Defence of Human Rights
MAFF	Ministry of Agriculture, Forestry and Fisheries
MFMA	Marine Fisheries Management Area
MoE	Ministry of Environment
MPA	Marine Protected Area
NEPA	U.S. National Environmental Policy Act
NGO	Non-Governmental Organisation
SIA	Social Impact Assessment
SLC	Social Land Concession
TWG-MFMA	Technical Working Group for the Koh Rong Archipelago MFMA
UNTAC	United Nations Transitional Authority in Cambodia
WTP	Willingness to Pay

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1 Introduction

This thesis is a preparative research towards a comprehensive and extensive Environmental and Social Impact Assessment (ESIA) of a coastal development project within a proposed Marine Protected Area (MPA), aiming to identify related potential impacts so that these can be acknowledged, justified or prevented. By using a Cambodian example, the researcher furthermore attempts to emphasise the necessity of a mutual understanding between conservationists and developers in order to achieve future sustainable development.

1.1 The Exploitation versus Conservation Dilemma

1.1.1 Ecosystem Services and Humanity

Goods and services provided by ecosystems are of vital importance for human society's well-being and economic development (Burke et al., 2001). A wide range of the world's most complex, diverse and productive ecosystems, including coral reefs, seagrass beds, mangroves, tidal wetlands, barrier islands, estuaries, beaches, peat swamps and others, are situated along the coasts (Burke et al., 2001; Brown et al., 2006). These important ecosystems are among the driving forces for the entire system earth, which provide a wide variety of essential services to humanity often categorised in cultural-, amenity-, provisioning- and supportive services (Burke et al., 2001; Brown et al., 2006; Tinch & Mathieu, 2011).

The world's economies as well as human life itself are based and dependent on the viability of these goods and services provided by functioning ecosystems (Burke et al., 2001). The value of global ecosystem services is estimated to be as high as USD 145 trillion per year (Constanza et al., 2014), with more than USD 2.5 trillion per year generated in coastal and oceanic environments (Hoegh-Guldberg et al., 2015). According to De Groot (2012), the highest ecosystem values per year and hectare worldwide are situated in the coastal environment, with USD 350,000 for an "average" hectare of coral reef and more than USD 1 million for a heavily visited coral reef.

The value and importance of coastal ecosystems to humanity are also reflected in global population demographics. More than half of the world's population lives within 200 km of

the coastline (Creel, 2003) – an area small as 10% of the earth's surface (Hinrichsen, 1999). Many countries worldwide have 80-100% of their population living not further than 100 km from the coastline (Martínez et al., 2007) with highest mean population density numbers in areas below 20 m above sea level (Small, & Nicholls, 2003). About two-thirds of the world's megacities with over seven million inhabitants are located along coasts (Pelling & Blackburn, 2014). The population growth rate of these coastal megacities is greater than that of any other urban area (Pelling & Blackburn, 2014) and it is estimated that the overall population within the 100 km inland boundary will increase by about 35% by 2025 (Ballinger, 2015).

Favourable coastal- and marine ecosystem services and high population numbers go hand in hand with high economic growth rates and industrial agglomeration. Coastal zones within the 100 km inland boundary of the United States, Western Europe and Northeast Asia, for example, cover only 3% of the earth's inhabited landmass but account for at least 32% of global Gross Domestic Product (GDP) (Gallup et al., 1999).

In regards to the previously mentioned facts, it becomes clear that humanity and the world's ecosystems "are bound together in a grand and complex symbiosis" (Burke et al., 2001, p.ix). Healthy and functioning ecosystems sustain humanity while at the same time the health of an ecosystem depends largely on the way humans interact with nature. A symbiosis between two entities, in this case between ecosystems and the entirety of their inhabiting species on one side and humanity on the other side, can have different characters. At present, humanity finds itself in the inconvenient position of having reached an impasse: it benefits at the expense of nature while being dependent on nature's prosperity in the long term (Burke et al., 2001).

On one hand, the exploitation of natural resources and ecosystem services is a key factor in economic growth and development, which have led to some substantial benefits for humanity (Cronin & Pandya, 2009). Through ecosystem conversion and exploitation, it was possible to double the world's population and increase the global economy six-fold from 1960 to 2000 (Reid et al., 2005). In these 40 years, the food production, water supplies and energy capacity were more than doubled (Reid et al., 2005; Wada et al., 2010) and the production of goods and commodities increased many times over to meet the demand of the growing population (Reid et al., 2005).

On the other hand, these gains and benefits were for the most part only achieved through massive resource depletions, which in turn led to often irreversible degradations and

collapses of highly productive ecosystems as well as to serious socioeconomic problems for some groups of people (Reid et al., 2005; Cronin & Pandya, 2009).

1.1.2 Exploitation of Ecosystems

Since 1980 about 35% of the world's mangrove forests and 29% of seagrass habitats have been lost (Valiela et al., 2001; Waycott, 2009). In the same period, about 34% of coral reefs have been destroyed or pushed close to collapse and an additional 20% are degraded (Wilkinson, 2008). In some areas, like the Caribbean basin, coral cover on reefs has even been reduced within three decades by an alarming 80% (Gardner et al., 2003). Due to unsustainable fishing methods, growing demand and poor management, 87% of fish stocks worldwide either are fully or overexploited (FAO, 2012a). In the Mediterranean Sea, the level of overfished stocks has reached a level as high as 91% (EC, 2014).

Not only coastal and marine ecosystems are experiencing high rates of degradation and conversion. According to a study by Hansen et al. (2013), only in the period from 2000 to 2012, worldwide 2,3 million km² of forests were lost – an area approximately the size of Greenland. In regions of West and East Africa as well as in regions of Southeast Asia, only 10-20% of the original rainforests still exist (Fairhead & Leach, 1998; Bane et al., 2007; Estoque et al., 2012). All over the world, massive habitat loss is contributing to a decline in biodiversity by pushing numerous species to extinction (Ceballos et al., 2010). Estimates on how many species are extinct every year vary due to the lack of solid numbers of living species (Ceballos et al., 2010). An extinction of between 200 to 2000 species per year is a conservative estimate, and these numbers are high enough to lead scientists to believe that human activities have initiated the earth's sixth mass extinction event (Leakey & Lewin, 1996; Wake & Vredenburg, 2008; Barnosky et al., 2011).

The aforementioned degradations and conversions of ecosystems are only some of the changes occurring in ecosystems that are affecting the availability of important ecosystem services. A study conducted and coordinated by the United Nations to address the condition of 24 key ecosystems services worldwide, concluded that 15 out of the examined 24 ecosystems services (approximately 60%) are being degraded or used in an unsustainable way “including fresh water, capture fisheries, air and water purification and the regulation of regional and local climate, natural hazards, and pests” (Reid et al., 2005, p.1). This degradation and unsustainable use is in particular of importance to humans, because in many cases, the poor and rural populations are the most directly affected by the loss and non-

availability of ecosystem services. These populations are often the most dependent on functioning ecosystems in terms of food supply, resources and protection from natural hazards (Reid, 2005; Díaz et al., 2006). However, poor and rural peoples often live in areas that are most vulnerable to ecosystem changes and financial means for alternatives are not always available (Reid, 2005; Díaz et al., 2006).

1.1.3 Measures of Ecosystem Protection

The knowledge about structure, function, role and importance of ecosystems has never been greater than at the present time, and it is widely known and accepted that if the character of human-nature interactions will not change towards a sustainable manner, ecosystems and their natural functions will be compromised and consequently putting the humans' wellbeing at risk (Tinch & Mathieu, 2011). Yet, in most cases, and mainly driven by globalisation and neo-liberal capitalism that do not attribute any intrinsic value to nature, it seems to be culturally legitimised that within a decision-making process economic growth is favoured over the environment (Ward, 2007; Magdoff & Foster, 2011). However, despite the implementation of economic growth boosting policies and the elimination of market restricting barriers, since the nineteenth century, governance systems and legislations let societies take action to protect themselves from the degradation of what society is based on (Polanyi, 1944; Robbins, 2007). Hungarian economist Karl Polanyi describes in his book *The Great Transformation* (1944) the social and political impacts and side effects of capitalism in Europe during the industrial revolution. Polanyi emphasises that inevitably economic growth needs to be looked at in close connection to the environment, and he describes the attempt of maintaining steady economic growth without destroying "human and natural substance of society" (Polanyi, 1944 [2001], p.1) as "the major paradox of the last 200 years" (Robbins, 2007, p.1):

[...] the market system implied a stark Utopia. Such an institution could not exist for any length of time without annihilating the human and natural substance of society; it would have physically destroyed man and transformed his surroundings into a wilderness. Inevitably, society took measures to protect itself [...] (Polanyi, 1944 [2001], p.1).

Modern measures of protection in the meaning of Polanyi can be interpreted among others as the designation of first terrestrial and marine protected areas since the early 20th century (Silva & Desilvestre, 1986; Jepson & Whittaker, 2002), the rise of restoration ecology

(Jordan & Lubick, 2011) and the first meetings of modern ecological economists in the 1980s (Costanza, 2003) as well as the increasing efforts to give ecosystem services an economic value (Balmford et al., 2002). The implementation of environmental impact assessment (EIA) starting in the 1960s served less as a measure of protection and more as a tool for measuring and assessing the impact of human activity on the environment (Wood, 2003). With increasing environmental awareness spreading in tandem with neo-liberal capitalism, humanity started questioning whether it is more important to conserve certain ecosystems and their services or to use their resources to bring forward economic growth (Evans, 2014). The aim of EIAs is to predict any kind of socio-economic, cultural and environmental consequences of a proposed resource exploitation, development project or technological change prior to their realisation (Carpenter & Maragos, 1989). Once the consequences of a proposed project are fully understood and acknowledged, decision makers can either justify its realisation or prevent potential unwanted consequences (Wood, 2003) by finding “[...] new alternatives for achieving development goals, together with sustaining environmental quality and renewable resources” (Carpenter & Maragos, 1989, p.xi).

Because EIAs can help to predict any kind of socio-economic, cultural and environmental consequences of a proposed project, they can be used as an assessment tool in any case that brings forward the exploitation versus conservation dilemma. EIA will be discussed further in chapter 2.3.

1.1.4 Exploitation versus Conservation Dilemma in Cambodia

The exploitation versus conservation dilemma is an omnipresent phenomenon and can be seen all over the world (Harvey & Knamiller, 1981) – from oil reserves under pristine rainforests (Finer, 2008) to resource extraction on northern peatlands (Chapman et al., 2003) and to future energy, mineral and fish exploitation options in the Arctic and Antarctic (Lennon, 2007). However, the dilemma seems to appear even more frequently in developing countries, where economic development is catching up at a fast pace to that of developed countries and growing populations need access to clean water, sanitation, food and functioning infrastructure (Reid et al., 2006).

Located in the heart of the Indo-Burma biodiversity hotspot¹, the Kingdom of Cambodia is a country whose geographic location, political situation and turbulent history make the exploitation versus conservation dilemma particularly remarkable (Souter, 2015). After years of civil war and economic stagnation in the late twentieth century, the country experienced a rapid economic transformation with economic growth rates of up to 10% between 1998 and 2008 – one of the highest growth rates in Southeast Asia (Hughes & Un, 2011; Milne & Mahanty, 2015; World Bank, 2015a). Without doubt, this transformation led to a number of economic, social and political improvements including higher incomes, infrastructure development, increased exports and rising life expectancy (World Bank, 2015a). Besides these benefits, the dramatic economic transformation led inevitably to a likewise dramatic environmental transformation (Milne & Mahanty, 2015). High deforestation rates (Hansen et al., 2013), severe overfishing (Allan et al., 2005) and numerous cases of land grabbing and land conflicts (Neef & Touch, 2012) are only some of the unwanted consequences of the economic transformation. With these worrisome social and environmental issues attracting international attention, the Cambodian government has made efforts in the last decade to take measures of environmental protection and conservation (Milne & Mahanty, 2015), including the implementation of terrestrial and marine protected areas (ICEM, 2003).

Given Cambodia's particularly high growth rates and strong commitments to economic development, its environmental protection measures often collide with intentions of resource exploitation. One example for this can be found in the coastal area. While the Cambodian government calls out for protection of at least 10% of coastal and marine areas, with high importance given for protecting biodiversity and ecosystem services by 2020 (Mulligan & Longhurst, 2014), economic land concessions (ELCs) for vast coastal areas and numerous islands are being granted, mostly to foreign investors with the aim to promote coastal development (ADHOC, 2013; CBRE, 2014; ODC, 2014b).

This is the case with the Koh Rong Archipelago, the study area of this research, where one finds vying development and conservation interests over the same resources. The waters encompassing the Koh Rong Archipelago, with their mangrove forests, coral reefs and

¹ The Indo-Burma Hotspot is defined as all non-marine parts of Cambodia, Lao PDR, Myanmar, Thailand and Vietnam, plus parts of southern China and covers a total land area of 2,308,815 km² (Mittermeier *et al.*, 2004). It is ranked in the top 10 hotspots for irreplaceability (Critical Ecosystem Partnership Fund, 2011).

seagrass beds, are on the verge of becoming the country's first Marine Fisheries Management Area (MFMA), which is equivalent to a Marine Protected Area (MPA) (Boon et al., 2014; Mulligan & Longhurst, 2014). The aim of the future Koh Rong Archipelago Marine Fisheries Management Area (KRA-MFMA) is to function as "[...] a model MFMA for conservation of marine biodiversity, sustainable fishing and tourism, contributing to poverty reduction" (Mulligan & Longhurst, 2014, p 79). Since 2010 the Royal Government's Fisheries Administration (FiA) assigned a range of local and international non-governmental organisations (NGOs) the task to conduct extensive surveys of the area and hold consultations with stakeholder representatives to realise the project (Boon et al., 2014; Mulligan & Longhurst, 2014). Simultaneously, the Royal Group, one of Cambodia's largest and most successful investment and development companies, is working together with its partners to realise their ambitious development plans for Koh Rong, the biggest island of the archipelago, on which they hold a 99-year concession, granted by Royal Government in 2008 (Royal Group, 2010; ADHOC, 2013; CBRE, 2015). The exploitation versus conservation dilemma becomes particularly clear in this study as intentions, perceptions and opinions amongst the stakeholders of how the resources should be used are greatly diverging. Future conflicts are inevitable as development plans and conservation plans at the present state are mutually exclusive (Royal Group, 2010; Mulligan & Longhurst, 2014).

1.2 Motivation

My initial intention was to conduct an economic valuation of the country's first MFMA by performing a Willingness To Pay (WTP) survey of tourists visiting the Koh Rong Archipelago and, based on that, to examine the feasibility of introducing a user fee that would be charged to support the MFMA management. In collaboration with Jesse Hasting (National University of Singapore), Berry Mulligan (Fauna & Flora International), Phallin Chea (Fauna & Flora International) and Jenn Reitz (Frontier), the WTP survey was successfully implemented and the results presented to the Technical Working Group for the Koh Rong Archipelago MFMA (TWG-MFMA) for further discussion. However, during my stay in the area I learned that the TWG-MFMA is not the only interest group making plans for the Koh Rong Archipelago's future. Through informal personal communications with members of the local communities and the TWG-MFMA, I was repeatedly told about a concession over 99 years that has been granted to a development company with plans for large-scale resorts, casinos, golf courses, marinas and an airport in the heart of the proposed

MFMA. This information drew my interest simply for the reason that if it proved true, I feared that the WTP survey of tourists conducted by our research group would be of little use for the introduction of a user fee, due to the complete change in the archipelago's character as a tourist destination and therefore of its change in tourist population. To learn more about this concession, I approached the developer, which turned out to be the Royal Group, one of Cambodia's largest and most successful investment and development companies, and arranged an interview with CB Richard Ellis (Cambodia) Co., Ltd. (CBRE Cambodia), the Royal Group's partner company in charge of the commercialisation of the concession and the acquisition of investors. There, the Royal Group's masterplan for Koh Rong was presented to me, including large-scale resorts, casinos, golf courses, marinas and an airport, verifying the information I had received on the island. An ESIA, however, that reportedly had been conducted in 2010, could not be provided and all efforts to track such assessments down remained fruitless.

I realised that both sides, the Royal Group and the TWG-MFMA, were not fully aware of each other's intentions, although they were working at the same time on plans for the same resources in the same area. The local communities had even less knowledge regarding development or conservation plans for the island on which they live, even though they will be directly and mostly affected by these plans.

I hope that my research will lead to a mutually beneficial conservation-development symbiosis within the Koh Rong Archipelago with the protection of important ecosystems, strengthening local communities and obtaining sustainable economic development.

Furthermore, I hope that the findings of my research will bring a theoretical and applied contribution to the dilemma of exploitation versus conservation in general and highlight the need of ESIA's and the improvement of ESIA law enforcement in Cambodia to counteract the present trend of environmental degradation, loss of ecosystem services and rising human rights issues due to uncontrolled development (Milne & Mahanty, 2015).

1.3 Objectives, Research Questions and Aim

Within this study, the researcher intended to assess the situation on Koh Rong and analyse the resource conflict by applying the tool of ESIA – a tool that according to NGOs and human rights groups is not applied sufficiently in Cambodia despite existing laws (UN, 2007; Baliga & Muyhong, 2015).

By conducting a preparative research towards an ESIA of the planned large-scale infrastructure development project within the proposed MFMA, the researcher tries to emphasise the exploitation versus conservation dilemma, identify and predict the potential socio-economic, cultural and environmental impacts of the proposed development to prevent and avoid unwanted consequences and find ways for future mutual conservation-development benefits. The primary objective hereby is to:

- Predict future environmental, cultural and socio-economic impacts as a consequence of the planned coastal tourism infrastructure development.

Therefore, the researcher performs the following sub-assessment as part of the preparative research, aiming to:

- Identify the current environmental and socio-economic state of the study area by reviewing literature, interviewing local stakeholders and collecting personal observations within the study area (baseline assessment);
- Examine and analyse the proposed conservation plans and intentions by reviewing literature, interviewing local stakeholders and project managers and collecting personal observations (conservation plan assessment);
- Examine and analyse the proposed development plans and intentions by interviewing the developer (development plan assessment);
- Obtain the stakeholders perceptions towards the planned development by interviewing stakeholders and by collecting personal observations (perception assessment);
- Examine and analyse a similar situation which occurred in Cambodia by reviewing literature and interviewing stakeholders (comparative assessment).

In order to perform the different sub-assessments of the preparative research, the current study addresses the following research questions:

1. What is the current environmental and socio-economic state of the study area?
2. What are the conservation and development plans for the study area?
3. What are the stakeholders' perceptions towards the development plans?
4. How have similar situations in Cambodia been handled?

Based on the analysis of research questions 1-4, the researcher is equipped with information enabling to proceed to the final question:

5. What are the potential impacts of the proposed development on the environment, communities and conservation plans in the study area?

The aim of the current research is to provide information for stakeholders, decision makers and the affected public about the planned development itself and about future potential environmental and social impacts as well as effects on other projects. The outcome of the study might help planners and decision-makers to either justify or prevent the potential loss of ecosystem services and to avoid the possible failure of reaching project goals by revising, adjusting or rescaling both, development and conservation plans as well as to find ways for a mutually beneficial conservation-development symbiosis within the study area.

1.4 Structure of the Thesis

The current thesis is structured in ten main chapters. The first and already presented opening chapter introduces the overall issue, the exploitation versus conservation dilemma, from a global context through to the local example of the study area as well as the researcher's motivation, objectives and aim. A thorough literature review follows in chapter two, which places the chosen Cambodian case study in a wider context. Therefore, the country's historical development, its recent economic and environmental transformation as well as the issue of economic land concessions will be discussed. Furthermore, chapter two presents the tool of ESIA, beginning with its origins, evolution and diffusion and ending with a description of its current legal framework and application in Cambodia. After a short guide through the study area in chapter three, chapter four presents the study's academic framework, followed by the chosen methods of primary and secondary data collection as well as an outline of the study's limitations in chapter five. In chapter six, the collected data is presented along with the different conducted sub-assessments. Based on the sub-assessments, the researcher estimated potential environmental and social impacts of the planned development, which are posed in chapter seven. The findings of the research's sub-assessments and the predicted potential environmental and social impacts of the planned development are summarised in chapter eight. Chapter nine provides recommendations for management and future research in order to achieve a mutually beneficial conservation-development symbiosis within the study area before chapter ten concludes with a recapitulation of the conducted research.

2 Literature Review

2.1 Cambodia – A Post War Situation

2.1.1 Historical and Political Context

It is important to recognise the country's turbulent history in order to be able to understand, examine and work with the challenges that the present-day Cambodia is facing in its efforts to achieve a sustainable future development.

Consequences of colonialism, civil war, brutal totalitarianism and foreign interventions that repeatedly draw the country into crises are still present (Povarchuk, 2004). Political and economic stability have only been achieved in recent years; therefore, government institutions as well as legal systems are relatively young (Schulte & Stetser, 2014).

After almost 100 years as a French protectorate and eight years of fighting for the Cambodian independence in the first Indo-China War, France accepted the country's full autonomy at the 1954 Geneva Conference on Indo-China (Keller, 2005). A short period of relative tranquillity followed under King Sihanouk, who initially retained neutrality in the Vietnam War (Hensengerth, 2008). However, in the mid-1960s the country became engulfed in the conflict after Sihanouk disapproved the continuation of air-attacks by the U.S. Air Force against retreats of the Viet Kong and North Vietnamese Army in the Cambodian jungle, due to the collateral impact of the bombings on the Cambodian population (Owen & Kiernan, 2006). Hence, in 1970 Sihanouk got overthrown in a CIA-backed military coup and was replaced by the much more U.S.-leaning president Lon Nol – an event that can be seen as the total unleash of the Vietnam War onto Cambodia (Hensengerth, 2008). A near-complete database released by the U.S. government reveals that in the years 1965 to 1975 the U.S. dropped around 500,000 tons of bombs on Cambodia; this makes it “ [...] even today one of the most heavily bombed countries in history” with more bombs dropped than by the Allied on Germany and Japan during the Second World War (Kiernan & Owen, 2010, p.4). Figure 1 shows the GIS mapping of U.S. bombing in Cambodia by the Cambodian Mine Action and Victim Assistance Authority (CMAA).

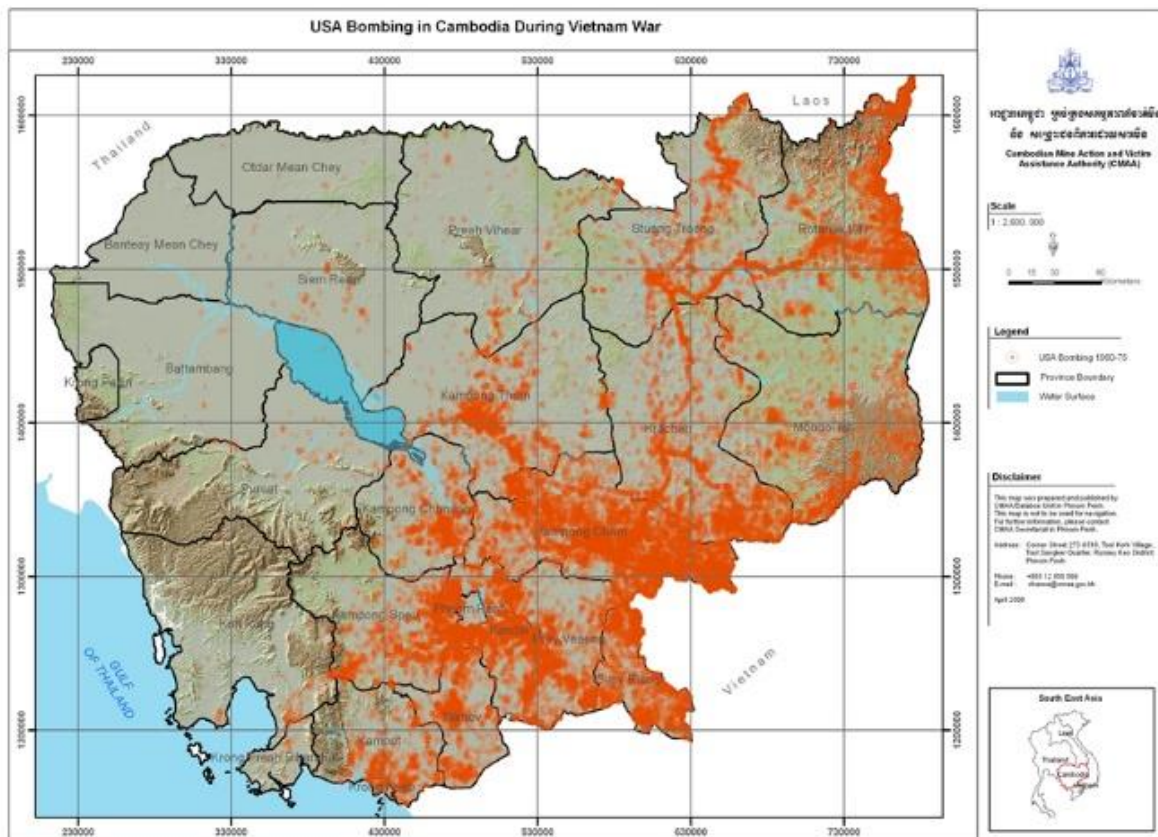


Figure 1: US-bombings in Cambodia (CMAA, 2008)

In addition to the hundreds of thousands of deaths among the civilian population, the effects of the massive bombing campaign pushed the Vietnamese Communists deeper into Cambodia, where they got in closer contact with the Khmer Rouge, a Cambodian communist guerrilla movement (Owen & Kiernan, 2006). This former relatively small-scale guerrilla movement quickly gained power, partly due to the massive impact of the bombings on the civilian population and the constant fear of U.S. carpet-bombings that was driving ordinary Cambodians gradually into their arms (Owen & Kiernan, 2006; Hensengerth, 2008). In total, the U.S. invested around nine billion U.S. dollars in bombing, humanitarian aid and military aid for Lon Nol's army to fight the Khmer Rouge (Hood, & Ablin, 1990). Despite all efforts, or perhaps because of the massive intervention, in 1975 after years of civil war, the Khmer Rouge under their leader Pol Pot eventually had gained enough power to overrun Phnom Penh, the last bastion of Lon Nol and the U.S. troops who were evacuated, leaving behind a country in chaos (Hensengerth, 2008). The rice production had fallen to one quarter of pre-war levels, food prices had risen by up to 5000% and only 2% of the national income was still generated from domestic sources (Hensengerth, 2008). Phnom Penh had been

overwhelmed by shelter seeking refugees and the city's population had risen from 600,000 to over three million (Hood & Ablin, 1990).

In the belief that the war would be over, leading to a normalisation of food prices and allowing life to go back to relative regularity, the civil population welcomed the Khmer Rouge arriving in Phnom Penh with cheering and applause (RFA, 2005). What in reality was about to happen was one of the most horrific and brutal social engineering experiments of the 20th century, causing the death of approximately another two million people – one quarter of the population (Povarchuk, 2004). To achieve a radical transformation of Cambodia into a distorted communist social order with a mixture of Maoism, Marxism and Khmer nationalism, the Khmer Rouge regime wanted the country to completely break with its past and therefore declared the beginning of their transformation program in 1975 as the Year Zero (Keller, 2005). Money was abolished, government documents and law books were destroyed, the central bank and courthouses were blown up, the education system was dismantled and several other measures were taken to disrupt the country's financial, governmental, legal and social structures (Povarchuk, 2004; Schulte & Stetser, 2014). Traditions, beliefs and earlier ways of life as well as Buddhism, books, private property and freedom of movement were forbidden (Keller, 2005). Intellectual people, professionals, monks, ethnic minorities and war refugees were considered as ideologically contaminated and therefore executed en masse (Hensengerth, 2008). Often knowing a foreign language or wearing glasses was enough to be killed (Chigas & Mosyakov, 2012). The overcrowded cities were emptied, and disregarding their age, gender or health, millions of people were forced into countryside labour camps to work in the agricultural sector under degrading conditions (Keller, 2005).

On top of the Khmer Rouge terror, border conflicts with Vietnam were occurring due to the attempt of land reclamations and the accusations by the Khmer Rouge that Vietnam was sabotaging the Cambodian revolution (Keller, 2005). Counterattacks were initiated and in 1979 Vietnamese troops invaded Cambodia, dislodged Pol Pot and the Khmer Rouge and took over Phnom Penh (Povarchuk, 2004). Vietnam established a regime “[...] that defined itself by its opposition to American hegemony and the capitalist system” (Povarchuk, 2004, p.648), resulting in a further period of civil war, international isolation, and sanctions that turned Cambodia into one of the poorest countries in the world (Keller, 2005; Schulte & Stetser, 2014).

In 1992 the United Nations intervened and established the United Nations Transitional Authority in Cambodia (UNTAC) to assume control, establish peace and oversee the democratic elections in 1993 (Povarchuk, 2004). During that time, the former Khmer Rouge commander Hun Sen was Cambodia's prime minister since 1985 (HRW, 2015a). Hun Sen lost the elections but refused to relinquish power. Subsequently, he jointly continued to serve as co-prime minister together with his opponent Norodom Ranariddh, until the latter got ousted in a bloody coup in 1997 (Ziegler, 2012; HRW, 2015a). Since then, Hun Sen is continuously holding prime minister's office, what makes him, with 30 years of tenure, Asia's longest serving political leader and one of the longest-serving leaders in the world (Ziegler, 2012; HRW, 2015a). International organisations repeatedly accused Hun Sen of being involved in a wide range of political corruption cases and serious human rights violations including "[...] extrajudicial killings, torture, arbitrary arrests, summary trials, censorship, bans on assembly and association, and a national network of spies and informers intended to frighten and intimidate the public into submission" (HRW, 2015a, p.2). Today, Cambodia officially is a multiparty democracy. In reality, the country's system of governance resembles a one-party state dominated by Hun Sen's Cambodian People's Party (Bahree, 2014). Southeast Asian director of Human Rights Watch, Roberts (2001), described the Cambodian government as "[...] vaguely communist free-market state with a relatively authoritarian coalition ruling over a superficial democracy" (p.35). During demonstrations in Phnom Penh against the disputed results of the last elections and strikes by trade unions for increased wages in 2013, several people got injured and killed by government security forces (HRW, 2015b). Hun Sen has vowed to rule until 2026 (Prak Chan, 2013). Next elections will take place in 2018 (Prak Chan, 2015).

2.1.2 Economic Transformation and Liberalisation of Markets

Following decades of conflict and war, in 1992 the UNTAC made great efforts to introduce order, law and democratic ideals (Povarchuk, 2004). Since then, Cambodia has undergone a remarkable economic transformation from a state of chaos, stagnation and international isolation to a free market economy (Hughes & Un, 2011) with economic growth rates higher than in "[...] almost any other post-conflict society" (Hill & Menon, 2014, p.2). Open market policies, the accession to regional and global trading systems and the dynamic Southeast Asian neighbourhood are some of the reasons for the growth of Cambodia's GDP at considerable average of 7% per year from 1992 until 2014 with an estimated further 7.4%

expansion in 2015 and 2016 (Hill & Menon, 2014; ADB, 2015). The per capita GDP has risen from about USD 216 per capita in 1992 to remarkable USD 2890 per capita in 2014 (MoE, 2012; World Bank, 2015c). According to a report released by the World Bank (2014a), Cambodia is one of the best performers in poverty reduction worldwide with a decrease in the poverty rate from 47% in 1992 to an estimated 19% in 2015 (MoE, 2012). Another indicator, especially important for the current study that reflects the great economic upturn in Cambodia and the country's opening to global markets is the increase of Foreign Direct Investments (FDI). Due to abundant natural resources, cheap labour and mainly implementation of an open and liberal foreign investment regime through the 1994 Law on Investment, FDI increased from only 2% of the GDP in 1993 to 12,9% in 2010 (NSDP, 2012; US Dept. of State, 2013). Since the implementation of the 1994 Law on Investment, the economy opened up all sectors for foreign investments and permitted a 100% foreign ownership in most sectors (US Dept. of State, 2013). These great potentials for investment are regularly promoted by Cambodia's prime minister to attract further foreign investments, mostly from China (Kunmakara, 2015a).

Despite the almost unlimited rights of foreign investors to establish and own business enterprises in Cambodia, the right to own land remains reserved solely to Cambodian citizens or legal entities (US Dept. of State, 2013). However, with implementation of the 2001 Land Law and Sub-Decree No.146, it became possible for foreign investors to secure control over state private land through Economic Land Concessions (ELCs) (ODC, 2015a). Being granted by the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of Environment (MoE), ELCs are long-term leases of land up to 10,000 hectares over a period of maximum 99 years, which allows the investor to clear and develop land (CDC, 2005; MEF, 2014; ODC, 2015a).

The objectives of ELCs are the attraction of large-scale capital investment, long-term development, increasing employment, livelihood diversification and the generation of state revenues through economic land use fees, taxation and related services charges (CDC, 2005; ODC, 2015a). Playing an essential role for foreign investments, the introduction of ELCs led to a significant increase of FDIs, especially within the agricultural sector (Socheth, 2012). Vietnam, China, Malaysia and Thailand are the four main investing countries in Cambodia (ODC, 2015a). According to a report released by Global Witness, 73% of Cambodia's arable land had been leased to private concessioners by the end of 2012 with a large percentage being foreign investors (GW, 2013). Figure 2, published by LICADHO in

2015, shows the ownership countries of 273 different concessions according to available data released by the government.

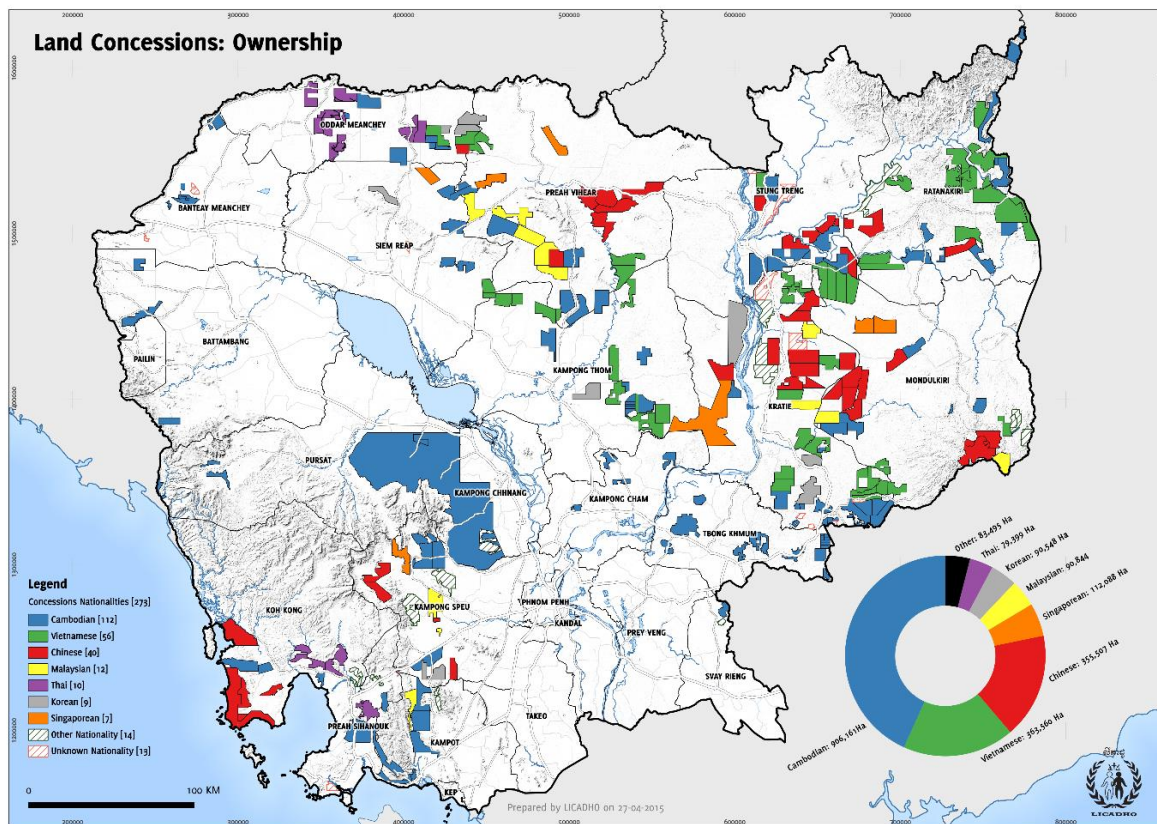


Figure 2: Ownership of land concessions by country (LICADHO, 2015a)

Apart from agriculture, mining and logging concessions, investors increasingly diversified their portfolios by focusing more and more on the hotel, resort and real estate industry (Killeen, 2012). Encouraged by growing tourist numbers, in 2006 the government unleashed a real estate boom by commercialising and promoting the Cambodian coastline as the new Indochinese Riviera and starting to grant ELCs for the coastal zone and offshore islands (Killeen, 2012). Backed by venture capital from mostly Hong Kong, Moscow and Paris financial markets, entire islands and vast coastal areas have been developed or are planned to be developed in the near future (Killeen, 2012). For the island of Koh Rong, the study area of this research, such an ELC was granted by the Royal Government to a Cambodian-Chinese conglomerate in 2008 (Titthara & Boyle, 2012; Mulligan & Longhurst, 2014).

Due to lack of transparency and non-provision of data by the authorities in charge regarding granted ELCs, it is almost impossible to assess exactly how many ELCs have been granted to how many companies for how much land in what locations (LICADHO, 2015a; ODC,

2015a). The Cambodian League for the Promotion and Defence of Human Rights (LICADHO) gathered in a five-year project the available data on ELCs, shown in Figure 3.

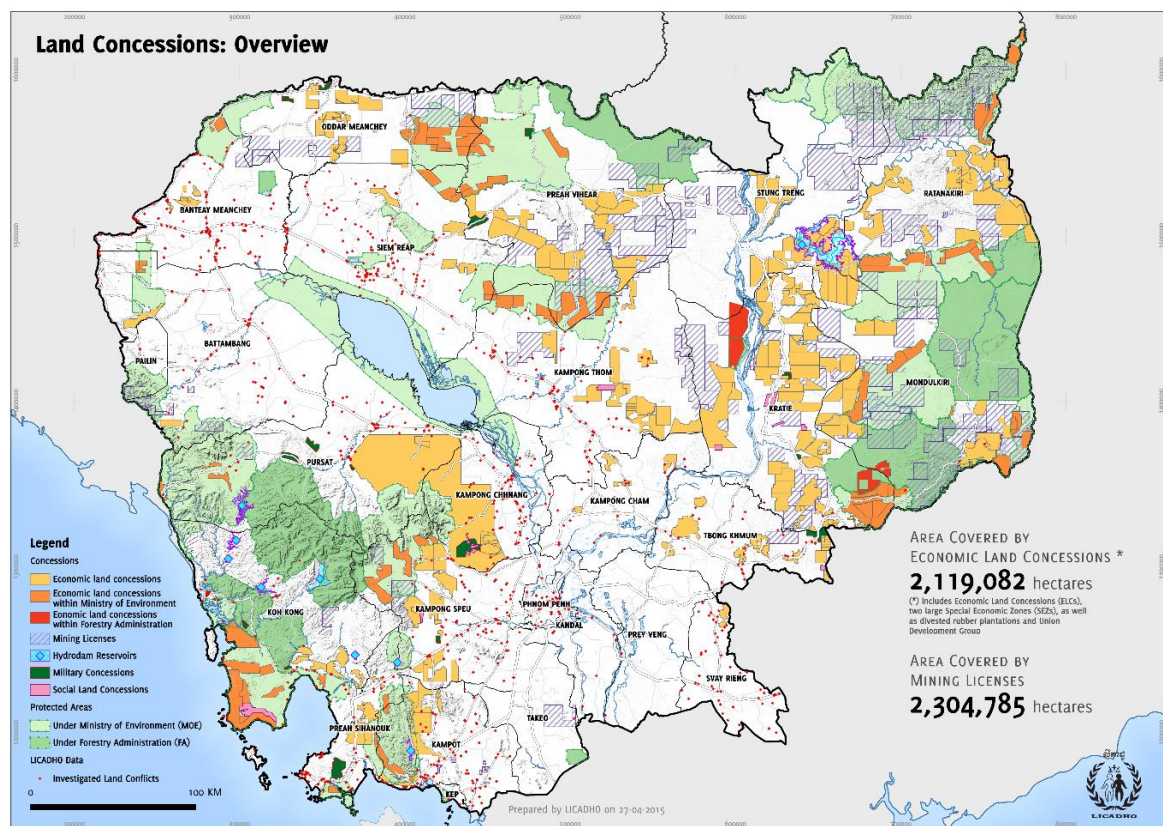


Figure 3: Overview of land concessions (LICADHO, 2015a)

The outcome was that the total area of ELCs in 2015 covers about 2.1 million hectares and an additional 2.3 million hectares are covered by mining licenses, which in total amounts to approximately 24% of Cambodia's total landmass (LICADHO, 2015a). LICADHO emphasises that the used data "[...] remains incomplete and may contain some inaccuracies" (LICADHO, 2015a, p.1).

2.1.3 Environmental Transformation and Protected Areas

Being the key source of the economy's goods, services and capital, it is not surprising that the environment experienced significant changes along with the great economic transformation described in the previous chapter (Milne & Mahanty, 2015).

The high rate of ELCs granted for purposes of industrial agriculture led to a wide conversion of forests to agricultural land (Milne & Mahanty, 2015). Between 2002 and 2012, Cambodia lost over 7% of its forests, giving the country the title of having the third highest national deforestation rate in the world (Hansen et al., 2013). Forest cover loss of 12,5% between

2009 and 2014 underlines a recent sharp increase of deforestation pace compared to 2,87% of lost forest cover between 2004 and 2009 (ADHOC, 2015). Primary rainforest cover dropped from 70% in 1970 to only 3.1% in 2014, pushing some of Cambodia's most rare tree species close to extinction (Butler, 2014; GW, 2015). Research conducted by ODC has revealed that in 2014 the area of non-forest ground cover (48.4%) exceeded for the first time the area of forest cover (47.7%) (ODC, 2014d). Figure 4 illustrates the total conversion of forests between 1973 and 2014.

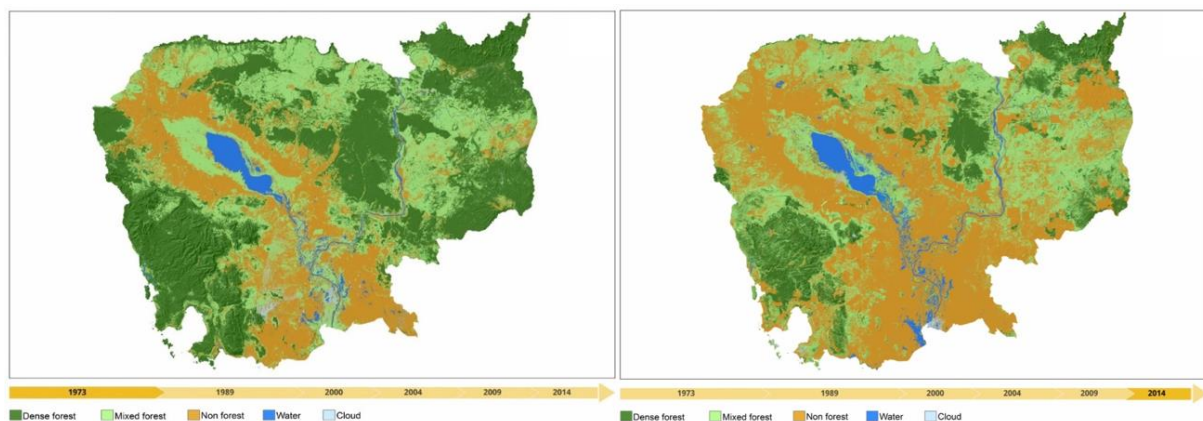


Figure 4: Conversion of forests in Cambodia between 1973 and 2014 (ODC, 2014d)

Besides the conversion of forest to cash crop plantations, agricultural land and mining areas through ELCs, widespread systematic illegal degradation of forests, especially within protected dense and evergreen forests, led to a further loss of forest cover (GW, 2015). According to a recently released study conducted by Conservation International, the illegally degraded lowland evergreen forest must be considered to be one of the world's top ten biodiversity hot spots (CI, 2015; Taguam, 2015).

The operators of such illegal logging operations can often be directly connected to military officials and government authorities (GW, 2015).

Another sector that clearly reflects the country's environmental transformation is the heavy exploitation of Cambodia's inland fisheries, especially within the Tonle Sap flood plain. The Tonle Sap Lake, which is considered to be one of the most productive freshwater ecosystems of the world (Varis et al., 2006), provides the source for 75% of animal protein consumed by millions of the country's rural population (Berdik, 2014). Being the world's most intense inland fishery (Baran, 2005; Neiland, 2008), fish populations are in sharp decline (Allan et al., 2005; Baran & Myschowoda, 2008). Already in 1995, increased fishing effort led to a decrease of catch per fisher by 50%, while the overall catch had nearly doubled (Allan et al.,

2005). Van Zalinge and Nao (1999) declared in 1999 the large and medium sized fish as overexploited and the small fish as fully exploited. According to local fishers, some species, like the endemic and critically endangered, migratory Mekong Giant Catfish, have dropped by 90% from 100 metric tons in 1993 to under 5 metric tons today in some fishing lots of the Tonle Sap Lake (Allan et al., 2005; Hogan, 2013). In recent years, commercial operators with monopoly licences to private freshwater fishing lots have ousted a large number of local fishers from their fishing grounds, which causes additional problems for small-scale fishers (Sneddon, 2007).

Besides environmental changes through increasing fishing effort, the construction boom in the fast growing capital Phnom Penh as well as the need for building materials in neighbouring countries, has led to a wide range of mineral resource extracting activities such as large-scale sand dredging operations, which are transforming vast coastal and fluvial ecosystems (Marschke, 2012). Furthermore, mainstream hydropower dam development projects along the Mekong River are especially reducing yields of migratory fish and other aquatic animals (IFReDI, 2012). The Inland Fisheries Research and Development Institute (IFReDI) estimates, that as a result of the above-mentioned environmental changes, the yearly consumption of fish consumed per capita in the floodplains around Tonle Sap Lake could be reduced from 63kg in 2011 to 29kg in 2030 with significant threats to the country's food supply (IFReDI, 2012).

An additional aspect of Cambodia's environmental transformation is the widespread pollution due to unmonitored and unregulated activities such as domestic waste disposal, use of agricultural chemicals and mining residues (Minh, 2006; Berg et al., 2007; Leakhana, 2009). The latter, for example, is the main cause for health-threatening mercury levels measured in the population along the Mekong River and animals inhabiting it (Murphy et al., 2006).

To encounter the numerous national and international stir causing negative side effects of the post-conflict rush to exploit natural resources for development purposes, the government strived to put measures of environmental protection in place (Milne & Mahanty, 2015).

Initially, in 1993, the Royal Decree on the Protection of Natural Areas (RGC, 1993) was passed, implementing 23 protected areas by applying the Protected Area Management Categories System designed by the International Union for the Conservation of Nature (IUCN) for defining, recording and categorising protected areas and their goals (ODC, 2015b). Subsequently, seven National Parks, ten Wildlife Sanctuaries, three Protected

Landscapes and three Multiple Use Areas were defined and put under the co-management of the MoE and other relevant institutions (San, 2006). They encompass more than 18% of the country's total land area, including more than 30% of remaining forests (San, 2006). In the following years, additional sub-decrees were adopted, defining new protected areas and adding them to the list (ODC, 2015b). However, an official list of all protected areas and their boundaries is not publicly accessible (ODC, 2015b).

In addition to the 23+ areas implemented with the Royal Decree on the Protection of Natural Areas in 1993 and its added sub-decrees, further three areas were designated in 1999 as protected under the Ramsar Convention (ODC, 2015b). This international treaty for the conservation and sustainable utilization of wetlands, internationally acknowledges Ramsar Sites as key wetlands due to their ecological importance (Ramsar, 2010). Like most protected areas in Cambodia, the Ramsar Sites are also under the administration of the MoE (ODC, 2015b).

According to the Law on Environmental Protection and Natural Resource Management passed in 1996 (RGC, 1996), Article 15, the MoE has the right and responsibility to intervene in activities within protected areas, if those activities have the potential to harm the environment. The MoE's responsibility is further emphasised in the additional Sub-Decree No.57 on the organization and functioning of the MoE (RGC, 1997), which states that preparation and implementation of policies and management plans for protected areas and the recommendation of new areas to be potentially integrated in the protected areas system lies in the hands of the MoE. Sub-Decree No.57 also puts the MoE in charge to cooperate, consult and advise other ministries to successfully co-manage the protected areas under its responsibility. Additionally, in 1994 the MoE issued a declaration (RGC, 1994) to prohibit a series of activities within protected areas. A full law on protected areas was, however, not passed until 2008 (ODC, 2015b).

The Protected Areas Law (RGC, 2008) is in existence since 2008 and it comprises the management, conservation and development framework to “ensure the management, conservation of biodiversity, and sustainable use of natural resources in protected areas” (Article 1). Furthermore, the law introduced a new zoning system, giving different zones within the protected area different terms of use, dividing the area in a Core, Conservation, Sustainable Use and Community zone (Article 11). Article 6 of the law reinforces the MoE in its duty of managing protected areas by giving it amongst other things the right to patrol the area, crack down on illegal activities, inspect licenses and permits for development and

economic activity, control export and import of natural goods and take actions to engage the public in the proper management.

According to the Protected Areas Law, any kind of development is prohibited within the Core zone of a protected area (Article 36). Development activities within the Sustainable Use and Community zone can be requested by the MoE and need an approval from the government before being initialised (Article 36). In general, any kind of proposed development, clearing or building within or adjacent to a protected area, must undergo an ESIA (Article 44).

In addition to the protected areas under the administration of the MoE, the Ministry of Agriculture, Forestry and Fisheries (MAFF) has claimed a number of environmental significant areas for biodiversity conservation, forest protection, genetic conservation, and wildlife habitat protection (Lacerda et al., 2004). These areas include protected forests and community forests under the direction of Forestry Administration (FA) and community fisheries (CFis) under the direction of the Fisheries Administration (FiA) (Milne, S. & Mahanty, S., 2015). Figure 5 and Table 1 published by OCD in 2014 summarise Cambodia's listed protected natural resources.

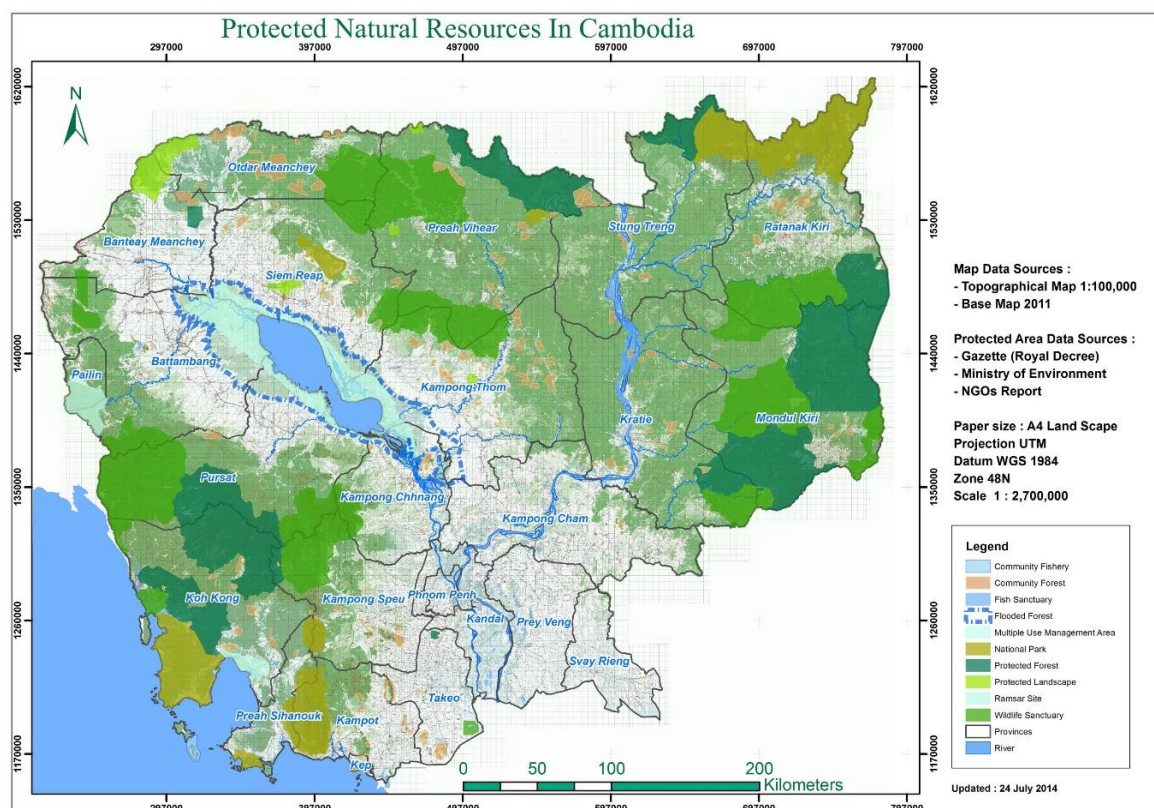


Figure 5: Protected Areas (ODC, 2015b)

Table 1: Summary of Cambodia's protected area system (Lacerda et al., 2004, p.4)

Category	Main management objectives	Management responsibility	Number of Protected Areas	Total area (km ²)
National Park	Conservation of biodiversity, ecosystems conservation and recreation	MoE	7	7,453
Wildlife Sanctuary	Conservation of biodiversity, scientific research and wilderness protection		10	18,913
Protected Landscape	Conservation of biodiversity and of specific natural and cultural features		3	970
Multiple Use Area	Conservation of biodiversity, sustainable use of resources in natural ecosystems		3	4,040
Ramsar Site	Protection of internationally significant wetlands		1 ²	161
Subtotal MoE			24	32,301
Protected Forest	Conservation of biodiversity, genetic resources and wildlife habitat	MAFF	8	
TOTAL			32	47,161

Cambodia's total landmass amounts to about 118,000 km². As can be seen in Table 1 and Figure 5, the total area of protected natural resources covers about 47,000 km², more than one third of the country's surface area.

2.2 Economic Land Concessions – Backgrounds, Benefits and Downsides

As ELCs play a significant role in the study area of the current research, it is important to take a closer look into the practice of granting ELCs in Cambodia as well as into their benefits and downsides.

As mentioned earlier, ELCs are long-term leases of state private land up to 10,000 hectares over a period of 99 years, granted by the Ministry of Agriculture, Forestry and Fisheries (MAFF) or the Ministry of Environment (MoE) (CDC, 2005; MEF, 2015; ODC, 2015a). ELCs are an important and a very common instrument to promote development, prevent its potential negative environmental and social impacts and, above all, to attract FDI into Cambodia in order to ensure national economic benefits (ODC 2014b). Around 2.1 million

² One of the 3 Ramsar sites lies completely within a Multiple Use Area and one is partially contained within a Wildlife Sanctuary and a National Park (Lacerda et al., 2004)

hectares of Cambodia's land have been granted to private concessioners since 1993 (LICADHO, 2015a), including 73% of the country's arable land (GW, 2013).

The creation of jobs and therefore increasingly dynamic local markets, tax revenues from land use fees and improved infrastructure such as roads, energy and water supply are often referred to as economic and social benefits gained through ELCs (Subedi, 2012). Increased agricultural productivity and diversified crops and proposed hydropower projects that will be capable to generate electricity for domestic consumption and export are further benefits associated with ELCs (Subedi, 2012). In some cases, private concessioners are involved in environmental training programmes and provide health facilities and schools for the communities within their concession area (Subedi, 2012).

However, there is not much evidence in the form of official and publicly accessible data, documents and reports to prove the mentioned benefits of ELCs (Subedi, 2012). Quite contrary to the seeming lack of information regarding the benefits of ELC's, there are a great number of reports and documents available, pointing out a series of negative effects of ELC's (Subedi, 2012). The United Nations Special Rapporteur on the situation of human rights in Cambodia uses the following words in a report for the Human Rights Council to describe and summarise some events connected to ELCs, which occurred during his mandate from 2009 through the end of July 2012:

[...] I have consistently received information about the human rights issues related to land concessions, including forced evictions, poorly planned resettlement and relocation, environmental destruction and unsustainable exploitation of natural resources, and threats to indigenous peoples' livelihood, culture and traditions, among others. An increasing number of cases have also come to my attention in which individuals and communities claiming their rights to land, land activists, and other human rights defenders have been harassed, threatened or criminalised based on challenges to the granting and management of economic and other land concessions.[...] (Subedi, 2012).

In fact, many of Subedi's observations can be verified and backed by literature. The Ministry of Economy and Finance (MEF) for example, states in a report published in April 2015 that the Cambodian government earned about USD 80 million by granting ELCs to private companies over the last three years (Kunmakara, 2015b; MEF, 2015). These revenues are significantly lower than expected and are, according to the MEF, a consequence of poor implementation of the ELCs by both ministries, the Ministry of Agriculture, Forestry and

Fisheries (MAFF) and the Ministry of Environment (MoE) (MEF, 2015). There is also little or no information available about to what extent the generated revenues have been used for social and economic development within the concession areas or if a concession has contributed to poverty alleviation (Subedi, 2012). On the other hand, there is a strong evidence that a closely linked elite of tycoons, politicians and so-called Neak Oknha³ involved in the allocation of ELCs, are growing spectacularly rich, while one-third of the population still lives on less than USD 0.61 a day (GW, 2015).

In the majority of cases, the allocation of ELCs led to an increased inequality of the distribution of land (Neef et al., 2013). Despite the fact that arable land per capita in Cambodia is amongst the highest in Southeast Asia (World Bank, 2010), it was estimated that in 2010, 20% - 30% of Cambodia's land was owned by just 1% of the population (UNCDF, 2010). One of the many examples for the concentration of land in the hands of a small elite can be found in the rubber tree industry, where 20% of the 1.2 million hectares of land leases for rubber plantations belong to only five of Cambodia's most influential tycoons (GW, 2015).

In many cases, concessioners operate behind a veil of complete secrecy and negotiations about the allocation of land to companies are held behind closed doors, without the participation and awareness of local communities who will be directly affected (Subedi, 2012). The increasingly unequal and obscure reallocation of land, has led inevitably to a sharp increase of land disputes between local communities, concessioners and the government since the mid-2000s (CCHR, 2013). It is estimated that since 2000, around 700,000 Cambodians have been negatively affected by evictions, land loss or forest clearance connected to ELC's (HRW, 2013). Land disputes, land grabs and forced evictions in connection with land concessions are seen as one of the biggest human rights issues that Cambodians are facing (NGOF, 2013). Only within the capital Phnom Penh, around 133,000 residents, over 10% of the city's population, were evicted between 1990 and 2008 and in 2009, and an additional 42,884 inhabitants have been relocated due to commercial development projects (LICADHO, 2009; UNCDF, 2010). Not only in the capital city but also in other urban and rural areas with growing economic potential, hundreds of thousands

³ Neak Oknha is a honourable Cambodian title for an especially rich and successful businessman who makes substantial financial contributions to national development projects (Respondent B, CBRE, pers. comm. 2015; Verver & Dahles, 2014)

of mostly marginalised members of Cambodian society have to fear eviction from their homes to make way for the capitalization of land and deregulated development projects, driven by a well-organised cooperation between government and private companies (ALRC, 2007; Amnesty International, 2008; Mgbako et al., 2010). Figure 6 by LICADHO (2014) illustrates the land conflicts between 2000 and 2014.

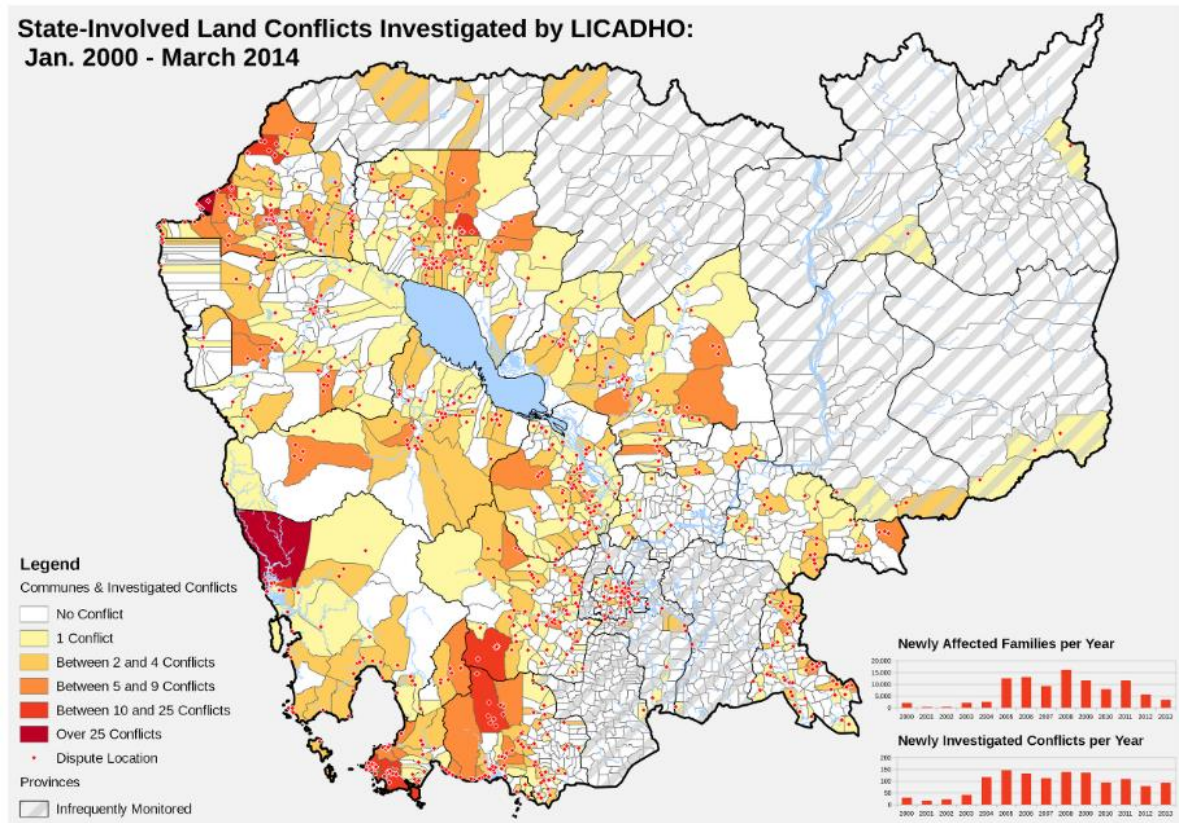


Figure 6: Land Conflicts 2000-2014 (LICADHO, 2014)

In a country where landownership has historically been tied to land use rather than formal title (Saracini, 2011), in the majority of cases, the people threatened by eviction suffer from the major disadvantage of not possessing valid land titles – a problem that is also rooted in the dissolution of all private ownership during the Khmer Rouge regime from 1975-1979 (Subedi, 2012). As mentioned earlier in this study, the efforts of the Khmer Rouge to disrupt the country's financial, governmental, legal and social structures implied the destruction of all administrative records, including land tenancy certificates (World Bank, 2014a). Furthermore, prior to the Khmer Rouge regime, the rural population had to abandon their homes due to the continuous American carpet-bombings and to seek shelter in the cities (Keller, 2005). When the Khmer Rouge took over in 1972, the overcrowded urban centres were emptied of refugee seekers who, disregarding their region of origin, were deported to

labour camps all over the country (Keller, 2005). The massive displacement of people and the loss of proper documentation during civil war and the Khmer Rouge regime, followed by a rapid transition to a market economy, led to an escalation of conflicts over land (Saracini, 2011).

The most vulnerable to land grabbing and forced evictions are the rural and poor populations, of whom only about 10% have titles to their land, which still is not a guarantee of secured landownership (UNCDF, 2010; Saracini, 2011). Insecurity of land rights and land grabbing have reached levels, where, according to the European Union Delegation to Cambodia, even “the original holder of an ELC cannot be sure not to be overpowered by ‘bigger fish’ and lose the ELC” (Johnsen & Munford, 2012, p.6).

Relocation sites for evictees provided occasionally by the concessioners are often in poor conditions, with insufficient infrastructure and inconvenient locations, with the result that these sites are often abandoned due to their inhabitability (Seangly, 2014). To improve the land situation of the vulnerable rural and poor populations, the Cambodian government introduced in 2003 Sub-Decree No.19 on Social Land Concessions (SLCs) with the aim to reduce rural poverty by transferring land to landless Cambodians for residential and farming purposes. (RGC, 2003; LICADHO, 2009, 2015). This new and (for Cambodia) progressive legal framework for allocation of land to the poor was thought to put an end to the common and discredited practices of land-grabbing and forced evictions (LICADHO, 2009). However, in many cases, the newly developed framework was either badly or not at all applied, resulting in a major failure of many SLCs (LICADHO, 2015b). To improve the process of land distribution to the poor, the Land Allocation for Social and Economic Development (LASED) project was initiated in 2008, sponsored by the World Bank with USD 11.5 million and the German Government with USD 1.2 million (World Bank, 2008; Müller, 2014). The aim of the project was to allocate 10,000 hectares of land to 3,000 poor households, to promote community development as well as to improve livelihood and agricultural support services in eight different locations (World Bank, 2008; Müller, 2014). In contrast to the positive reports regarding the effectiveness of SLCs released by the World Bank and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, human rights groups condemned the project as miserably failed, protesting against a potential initiation of a USD 25 million costing second phase (LICADHO, 2015b). A survey on the conditions of all SLC sites supported by the LASED project was conducted by LICADHO between October 2014 and March 2015, showing that the allocation process was

slow, settlement rates were low, tenure security was illusory and that in most cases the land allocated to the poor was unsuitable for agriculture while at the same time vast areas of arable land were given to private companies in the form of large concessions (LICADHO, 2015b). Apart from the described negative social impacts, ELCs also have some negative environmental effects. In strong contradiction to the existing domestic laws and international agreements on protected areas presented in the previous chapter, concessions for the purpose of development or resource extraction have increasingly been granted within protected areas, with the approval and backing of the MoE, contributing to large-scale forest degradation through logging and clearcutting for infrastructure (Subedi, 2012; Jiao et al., 2015). The most recent example for such an occurrence within a protected area is the inauguration by the Minister of Environment of a USD 52 million rubber plantation project within a Wildlife Sanctuary (Pheap, 2015a). The 10,000 hectares concession was granted in 2011 to a controversial timber magnate, who according to numerous reports is the central player in vast, hundreds of millions of dollars heavy and illegal logging operations (GW, 2015; Pheap, 2015a). Since the granting of the concession, almost the entire area has been clear-cut from protected forest, including species like the protected resin trees, on which harvest the nearby communities relied for their livelihoods (Pheap, 2015a). A study conducted by Ahrends et al. (2015) suggests that by 2020 Cambodia will have lost 250,000 hectares of protected area only to rubber plantations, if the current trend is maintained.

According to the MoE, almost 20% of the protected areas in 2011 were granted to at least 109 Cambodian and foreign companies in 16 out of the 23 protected areas established by the 1993 Royal Decree. They have been used for rubber plantations and other agro-industrial crops, mining exploration, hydropower dams and tourism development (Subedi, 2012).

In 2012, the government found itself constrained to issue a moratorium on the allocation of new land concessions and implemented measures of strengthening the effectiveness of ELC management, following a series of complaints and concerns raised by international NGOs, UN agencies and development partners regarding the negative impacts of Cambodia's vast ELC-granting activity (EU, 2012; MLMUPC, 2012; LICADHO 2015a; ODC, 2015a). At the same time, a new land demarcation and titling program for poor rural communities was initiated (Neef et al., 2013). According to Subedi (2012), the UN Special Rapporteur on the situation of human rights in Cambodia, both the moratorium and the land demarcation program lack consistency, "comprehensive planning and harmonization with the existing legal framework" (p.37). Land concessions that supposedly had their contracts cancelled are

still listed among the Ministry of Agriculture, Forestry and Fisheries' (MAFF) current ELC statistics, according to information that ODC obtained from official government sources (Subedi, 2012; ODC, 2015c). In addition, over 200,000 hectares of new land concessions were still granted between the announcement of the moratorium and the end of 2012 and at least two new ELCs were reportedly granted in 2013 (ADHOC, 2013).

Impeccable laws, policies and regulations regarding the granting and management of ELCs and other concessions were developed by the government in order to guarantee the social, environmental and economic benefits of those. The legislation exists, but the problem is that this domestic legal framework, relatively well-developed in theory, is rarely applied (Subedi, 2012).

2.3 Environmental Impact Assessment

2.3.1 Origin, Evolution and Diffusion of Environmental Impact Assessment

Environmental Impact Assessments (EIAs) are interdisciplinary analyses of the possible socio-economic, cultural and environmental effects caused by a proposed development, resource exploitation or technological change prior to its realisation (Senécal et al., 1999; Felleman, 2013). The purpose of an EIA is to inform the developer and financiers as well as stakeholders, authorities and other decision makers and the affected public about possible unwanted social and environmental impacts, as well as about the proposed action itself. It also is meant to suggest alternative solutions to negative impacts and realistic and attainable mitigation measures to unavoidable negative impacts (Felleman, 2013).

The origin of EIAs lies in the 1960s and can be seen as a reaction to the post-World War II economic expansion in the Western world (Wood, 2003; Ogola, 2007; Felleman, 2013). This period of high economic growth rates, also known as the “Golden Age of Capitalism”, was initially characterised by solid financial stability, high rates of labour productivity and capital accumulation, sustained growth, full employment and other economic, social and political improvements (Glyn, 1988). Over time, the widespread negative impacts on ecosystems and environment resulting from the economic boom could no longer be outshined by economic success and prosperity (Ogola, 2007; Felleman, 2013). With increasing environmental awareness and obvious environmental degradation, a tool in the form of an integrated holistic

approach was needed to protect the environment from the negative and unwanted consequences of development (Ogola, 2007).

The U.S. was the first country to react to the demand for environmental protection by enacting the U.S. National Environmental Policy Act (NEPA) in 1969 (Wood, 2003). Although regulations such as the U.S. Clean Air Act already existed to address specific aspects of the environmental impacts of development, NEPA was the first framework to address the multiple environmental aspects of a single project simultaneously (Felleman, 2013). A result of NEPA was the creation of an EIA process with the aim of promoting collaboration among stakeholders regarding environmentally controversial decisions and to gather, generate and disseminate information about their environmental impacts (Felleman, 2013).

After a series of prominent legal cases highlighting the importance of EIAs in the U.S., EIA and NEPA quickly gained international attention (Wood, 2003). With the 1972 United Nations Conference on the Human Environment in Stockholm, the outcomes of EIA were widely acknowledged by other jurisdictions and because the problems of pollution and environmental degradation addressed by EIA were seen as universal, EIA tools were adopted by many of them (Wood, 2003).

Gradually, many countries and international organisations implemented their own version of EIA processes and contributed to the further diffusion of diverse EIA systems around the world (Wood, 2003). However, the state of implementation varies widely between countries (Li, 2008). Figure 7 by Glasson et al. (2005) shows roughly the current implementation status of the EIA systems worldwide by continent.

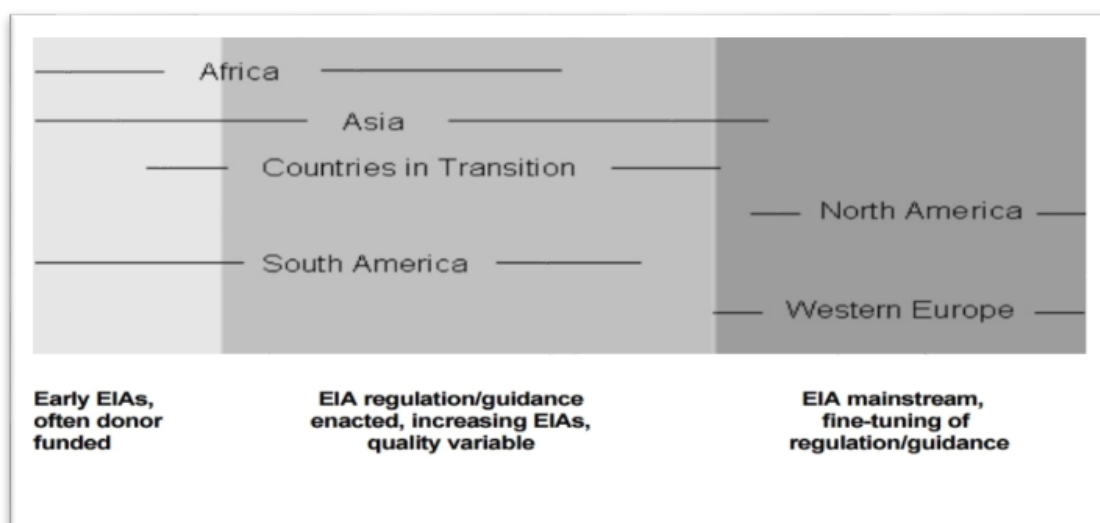


Figure 7: Implementation status of EIAs by continent (Glasson et al., 2005, p.309)

Most of the developing countries, as seen in Figure 7, are still in the procedure of adaptation and implementation while in developed countries EIAs are well established and backed by legal frameworks (Ogola, 2007; Felleman, 2013).

Since its evolution in the 1970s, or more precisely since the EIA of the Trans-Alaska pipeline in 1973, the EIA process also incorporates a strong component of social impact assessment (SIA) as a regular feature to identify, underline and manage the social issues of project development (Turnley, 2002; Vanclay et al., 2015). To fulfil the NEPA requirement of understanding the impacts of the Trans-Alaska pipeline on the human environment⁴, the EIA included a social key component, discussing potential changes in Inuit culture caused by the realisation of the project (Turnley, 2002).

Over time, independent SIA practices evolved and diverged from the EIA in order to achieve better outcomes for affected communities and to improve the management of social issues (Vanclay et al., 2015). In fact, institutions like the International Association for Impact Assessment (IAIA) support the implementation of separate SIA (Vanclay et al., 2015).

SIAs, however, are considered by most scientists and organisations as an inextricable key component of EIAs due to the interconnectedness of environmental and social issues. They therefore call for an integrated ESIA to achieve a full understanding of all impacts caused by the biophysical and social changes associated with a planned intervention (Slootweg et al., 2001; FAO, 2012b; Vanclay et al., 2015).

2.3.2 Environmental Impact Assessment in Developing Countries

EIA systems are of particular importance for developing countries with high economic growth rates (Schulte & Stetser, 2014). Only recently have EIAs found increased acceptance in most less developed regions (Ogola, 2007), where they were primarily introduced due to external pressure coming from international environmental NGOs, the donor community and other interest groups (Li, 2008). Being mainly a result of internationally driven top-down implementation processes, EIAs in developing countries often have the character of a “[...] standardised, bureaucratised and procedural formality” rather than being “[...] a real solution for intertwined environmental and socio-economic problems” (Li, 2008, p.6).

⁴ Human Environment: Aspects such as business and employment, income and other socio-economic aspects, use of land and resources, health, education, infrastructure and socio-cultural features (BMP, 2009).

A good example for such an introduction of EIA systems by external interest groups to developing countries can be found in the Mekong Sub-region, where international donor organisations like the World Bank and the Asian Development Bank funded environmentally questionable development projects that increasingly provoked criticism and attracted the attention of international NGOs and other organisations (Hironaka, 2002; Li, 2008). As a reaction to the criticism, international donor organisations have refined and adjusted their EIA processes to reduce unwanted environmental and social consequences of their development projects and therefore have played an important role in the dissemination and diffusion of EIA practices in the Mekong River Basin countries and many other regions (Li, 2008, Lohani et al., 1997).

However, in many cases, the implementation of EIAs in developing countries is less successful than in developed countries, even though they are based on the same principles (Li, 2008). Due to the external top-down implementation of environmental protection measures, proactive domestic initiatives in developing countries to implement EIA practices are rare (Hironaka, 2002; Li, 2008). Furthermore, authorities responsible for the implementation of EIAs are often politically subordinate or financially dependent on government bodies and private companies that are proposing a project (Tan, 2004). Under these circumstances, a lack of self-assertion and political will from environmental authorities towards the implementation of informative EIAs is to be expected (Tan, 2004). The performance of EIAs is therefore often delayed and only done as a formality, after major decisions about project design and scale have already been finalised (Li, 2008). Manorom (2007) uses an example of a proposed development project in the north-east of Thailand and states that local communities and NGOs within the Mekong Sub-region tend to mistrust the outcomes and validity of EIAs. This is especially due to insufficient involvement of affected local communities and non-inclusion of local expertise, resulting in a notorious underestimation of social and environmental impacts by the implementing authority (Manorom, 2007). Another factor for the deficiency of EIA implementation in less developed countries is the lack of qualified manpower and financial resources to assess the current state of affected ecosystems, natural resources and population (Tan, 2004; Li, 2008).

2.3.3 Environmental Impact Assessment in Cambodia

The laws regulating EIAs do exist in Cambodia, such as the 1996 Law on Environmental Protection and Natural Resource Management and the 1999 Sub-Decree on Environmental

Impact Assessment Process (EIA Sub-Decree). However, their implementation suffers from non-compliance and other negative factors typical for developing countries, as mentioned in the previous section (ODC, 2014a; Schulte & Stetser, 2014).

For example, Article 1 of the EIA Sub-Decree states that EIAs “[...] shall be done on every project and activity, private or public, and shall be reviewed by the MoE” (CDC, 1999). *De facto*, according to the MoE, not a single EIA had been conducted from 1999 to 2003 and only 110 have been conducted for an estimated number of 2000 major development projects from 2004 to 2011 (Lewis & Narim, 2012). In many cases where EIAs had been conducted, the documents are considered as “intellectual property” of the respective company and are therefore protected by the MoE and not accessible for the general public (Gätke & Borin, 2013). This contradicts another statement of Article 1 of the EIA Sub-Decree, which says that one of the purposes of EIAs is to “[...] foster public participation in the environmental impact assessment process in recognition that their [the public’s] concerns should be considered in the project decision-making process” (CDC, 1999; Gätke & Borin, 2013). Another flaw in EIAs carried out in Cambodia is the timing of their performance. In many cases, EIAs were conducted long after the work on the project in question had started, and major projects with potentially far-reaching impacts were therefore often approved and implemented prior to the EIAs completion (Grimsditch, 2012).

The approval for Cambodia’s first major hydropower dam, for example, the Kamchay Dam project in Kampot Province, was granted in 2005 to Sinahydro Corporation, China’s largest dam builder (IR, n.d.). The construction started in 2007 and in the following years, 2,000 hectares of protected forest within the Bokor National Park were flooded, an area of high importance to local communities for the provision of resources and home to a number of globally endangered species (IR, n.d.). The EIA for the project was, however, only completed in 2011, just months before the dam became fully operational (IR, n.d.). Public participation in this EIA was almost non-existent, as revealed in a field research conducted by Grimsditch (2012), who found out that even after four years of construction and two months prior to its full realisation, the awareness of affected communities regarding the project was quite low. A similar but more recent case of an EIA conducted, for another major hydropower project currently under construction, is that of the Lower Sesan II Dam in Cambodia’s north-eastern Stung Treng Province. In 2012, the approval for the construction of the dam was granted to the Royal Group, Cambodia’s largest investment and developing company, which, being in charge of the development assessed within this study, will again

be discussed at a later point, and the Chinese company Hydrolancang International Energy, constructing the dam (Mekong Watch, 2013). The EIA for this project was performed in 2010 (Mekong Watch, 2013), meaning that with two years prior to the project's final approval, the assessment was done at the right time. Nonetheless, apart for being criticised as flawed and inadequate by independent scientific experts, communities and other stakeholders (Baird, 2009), numerous civil society organisations from Cambodia and the entire Mekong region are currently demanding a halt on the construction and the performance of a new EIA, expressing strong concerns regarding adverse impacts due to significant alterations of the project design, rendering the 2010 EIA inapplicable (IR, 2014). The notorious non-compliance with environmental laws and disregard of EIA regulations have led to several unwanted negative social and environmental consequences and numerous cases of national and international protests against development projects (McMorran, 2013; Reaksmey & Willemyns, 2013; Chen & Narim, 2014).

Admitting that Cambodia's legal framework for implementation of EIAs is incomplete and therefore not useful for the promotion of sustainable development, since 2011 the MoE has been working on a new EIA law (ODC, 2014a; Schulte & Stetser, 2014). In cooperation with Cambodia's leading public interest law firm, the Vishnu Law Group, drafts of the EIA law have been distributed to stakeholder groups and a series of public consultation meetings have been held aiming to develop an EIA law "[...] in the most transparent and participatory manner possible" (Vishnu Law Group, 2014, p.3).

According to Schulte and Stetser (2014), the most current fifth draft of the EIA law seems to have received widespread support and, if implemented in the current version, has the potential of being the most robust EIA law within the Mekong Sub-region. The clarification of institutional authority and the EIA process itself, the promotion of public participation and information disclosure as an integral component of the EIA process as well as the improvement of EIA monitoring and enforcement are some of the major improvements comprised in the draft EIA law (Schulte & Stetser, 2014).

However, NGOs and civil society groups have raised concerns after the latest national consultation workshop in Phnom Penh (Muyhong & Baliga, 2015). A newspaper article by Muyhong and Baliga (2015) states that concerns are directed towards contradictions regarding rights of indigenous people and the non-appliance of the law for "[...] state development projects and activities that relate to national security, sovereignty or disaster management". These matters are in the process of being reviewed (Muyhong & Baliga,

2015). However, the effort to develop a contemporary EIA law suitable for Cambodia's situation can be seen as a commitment to a more sustainable future development.

3 Study Area

This chapter will provide general information about the study area. The information is sourced from literature review. Occasionally, the given information was obtained through interviews conducted by the researcher in the study area. In these cases, the interviewees are kept anonymous for the sake of the protection of sources. Detailed information about the area will be given in chapter 6.1, the baseline assessment of the study.

The study area of this research is the island of Koh Rong and its surrounding waters. Figure 8 by Mulligan and Longhurst (2014), shows a map of the Koh Rong Archipelago (KRA) and its location in the Kampong Som Bay, Gulf of Thailand.

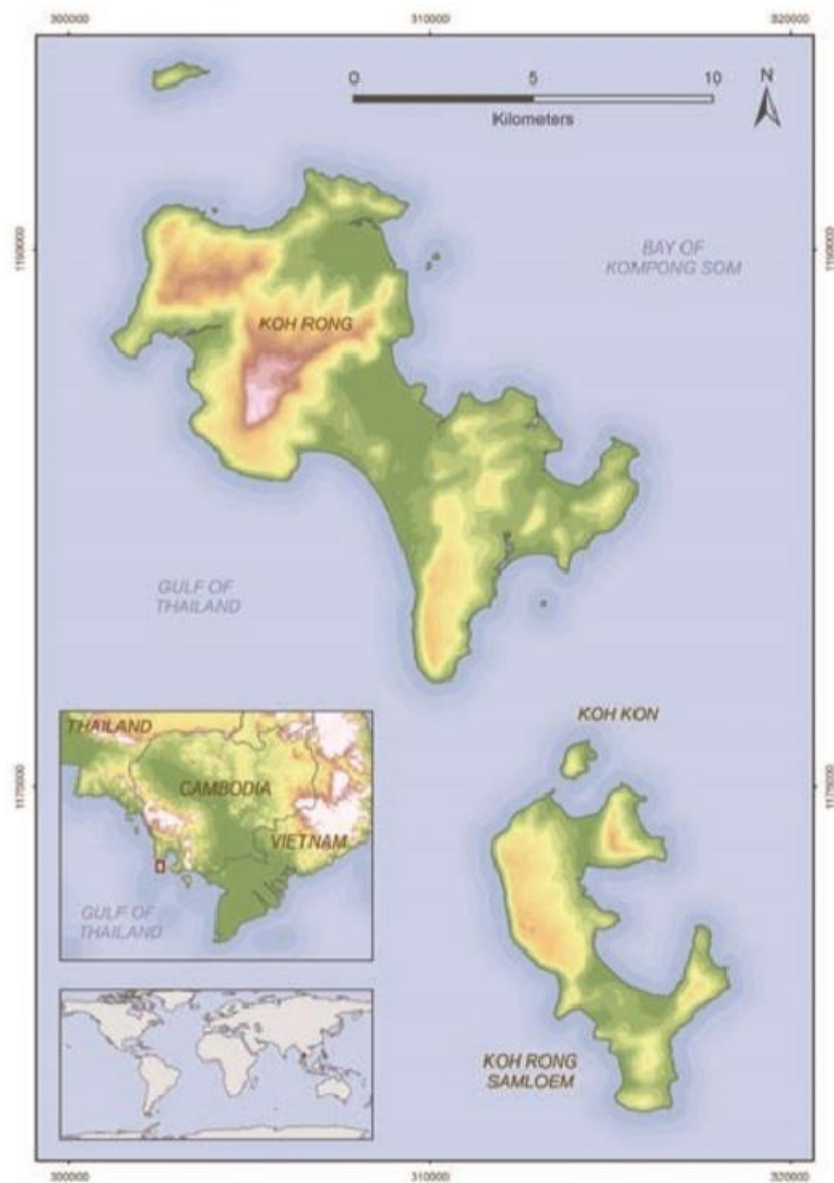


Figure 8: Map of the Koh Rong Archipelago (Mulligan & Longhurst, 2014, p.33)

With its expanse of approximately 74 km² and a 61 km long coastline, Koh Rong is the biggest of six islands belonging to the Koh Rong Archipelago (Sophat & Reasey, 2010; SSF, 2014) and the second largest of Cambodia's overall 64 islands (Rizvi & Singer, 2011). Located in the Gulf of Thailand about 20 km off the coastal town Sihanoukville, Koh Rong is legally part of the Preah Sihanouk Province (Mulligan & Longhurst, 2014).

Its roughly elongated shape stretches from south-east to north-west with about 15 km in length and 3-9 km in width. The terrain is hilly with the highest elevation in the north-east of 316 m. The biggest part of the island's coastline is made up of about 28 beaches, adding to a length of approximately 44 km, connected by rocky shores and mangroves (Millennium Group, 2009). The bedrock consists of sandstone. Most of the island is covered with broadleaved evergreen forest with some parts being clear-cut for agricultural purposes, infrastructure or resource extraction (pers. obs.). Located at the center of the Indo-Burma biodiversity hotspot, not only Koh Rong but the entire archipelago hosts a great diversity of terrestrial flora and fauna including a range of endemic species and globally listed threatened species (Toulson et al., 2013). Seagrass meadows, mangrove forests and fringing coral reefs systems surrounding the island are likewise considered as high biodiversity areas and provide important marine habitats for a vast number of marine species, also including globally listed threatened species (Mulligan & Longhurst, 2014). Since 2010, the Royal Government's FiA assigned a range of local and international NGOs the task to conduct extensive surveys of the coastal and marine habitats with the aim to establish the country's first Marine Fisheries Management Area (MFMA), which is equivalent to a Marine Protected Area (MPA) (Boon et al., 2014; Mulligan & Longhurst, 2014).

As mentioned earlier, Koh Rong is the biggest island of the Koh Rong Archipelago, of which only two islands are inhabited. The second largest island with approximately 24 km², is called Koh Rong Sanloem and is located south of Koh Rong at a distance of about 4-5 km. Several uninhabited, much smaller islands and islets neighbour Koh Rong and Koh Rong Sanloem (Mulligan & Longhurst, 2014). Apart from their size, the two major islands of the archipelago feature very similar environmental conditions. These similar conditions and their proximity to each other result in a related flora and fauna of the Koh Rong and Koh Rong Sanloem islands (anon., pers. comm., 2015).

According to information from local inhabitants, a small population of unknown size lived on the archipelago in the years before 1975. During the Khmer Rouge regime, the islands were evacuated and therefore uninhabited from 1975 to 1979 (anon., pers. comm., 2015).

Starting in 1979, the Navy authority governed a five-mile zone around the islands until 2000 (Touch, C., n.d.). Along with additional settlers, people who inhabited the archipelago prior to the evacuation started to repopulate Koh Rong and Koh Rong Sanloem during this period (anon., pers. comm., 2015). The Koh Rong commune, however, is a relatively new commune, officially established in 2000 and since then has been managed by the Sihanoukville governor and the Navy authority (Touch, n.d.).

Today, the population of Koh Rong amounts to an estimated 1717 inhabitants, distributed to 400 households and four villages along the coast (Mulligan & Longhurst, 2014). The interior of the island is not populated. According to the National Committee for Sub-national Democratic Development's (NCCD) commune profile, in 2010 the total population of the entire Koh Rong Archipelago counted 2016 inhabitants (NCCD, 2010). Fishing is the primary income source, followed by small-scale crop cultivation, other agricultural activities and a growing number of tourism-related activities (Mulligan & Longhurst, 2014).

Infrastructure on Koh Rong is relatively undeveloped. Electricity is available through generators. The most important means of transportation are boats, as the island's road system is very limited.

In recent years, the island has increasingly become an attractive and important tourist destination for Cambodians as well as for international visitors, boosted by the fast growing tourism industry in the 20 km distant coastal city Sihanoukville (anon., pers. comm., 2015). With the growing tourism industry, a comprehensible number of mostly foreign-run guesthouses and bungalow resorts settled on the island, mainly in the south-eastern tip, which is the main arrival point of the ferries coming from the mainland (pers. obs.). Estimations by the Provincial Tourism Department suggest that in 2015 around 150,000 tourists may visit the Koh Rong Archipelago (Hasting et al., 2015).

In line with the government's efforts to promote coastal development and to attract FDI through the resort and real estate industry, the Royal Government granted in 2008 a 99-year concession over the island to the Royal Group, one of Cambodia's largest and most successful investment and development companies. The Royal Group's masterplan includes developing multiple resorts, casinos, marinas, golf courses and an airport (Millennium Group, 2009; Royal Group, 2010).

4 Academic Framework

4.1 Preparative Research towards Environmental and Social Impact Assessment

As stated earlier in this study (chapter 2.3), ESIA's in general are used to interdisciplinary identify and analyse possible environmental, social, and other relevant impacts associated to a planned development, resource exploitation or technological change prior to its realisation (Senécal et al., 1999; Felleman, 2013). To do so, a full ESIA ideally comprises several interacting steps within a cyclical process as shown in Figure 9 by Glasson et al. (2005).

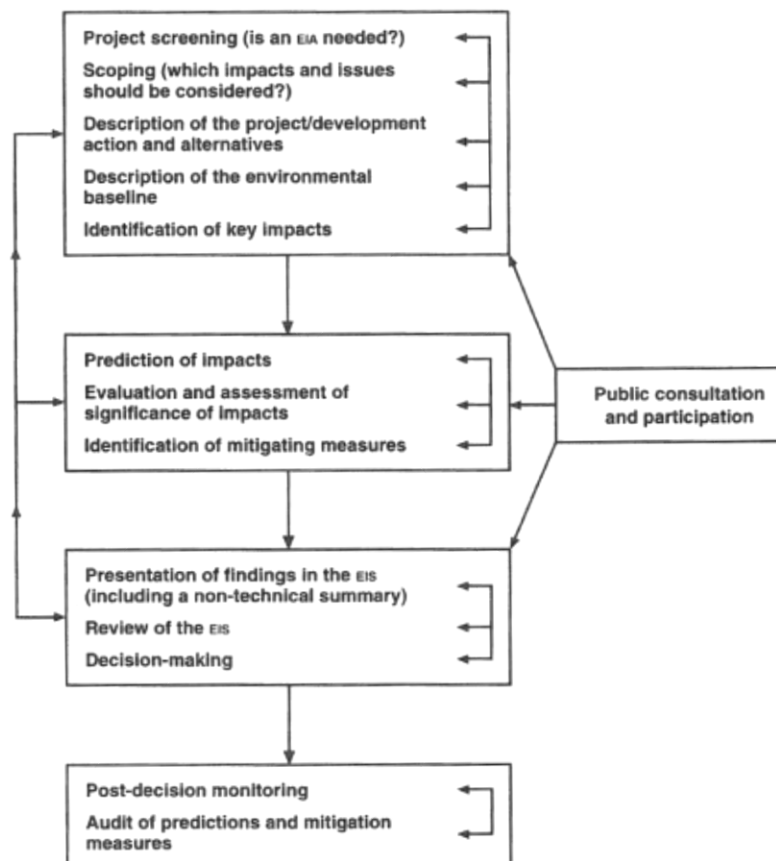


Figure 9: Important steps in the ESIA process (Glasson et al., 2005, p.4)

However, in practice, the framework applied for an ESIA process will in most cases vary considerably from the process illustrated in Figure 9 (Glasson et al., 2005). Depending on the specific context in which an ESIA is performed, the various steps of the process might be taken in a different order and some steps might even be entirely skipped (Glasson et al., 2005).

Even though there is no exclusive approach to the performance of an ESIA, some basic but essential rules have to be considered in order to obtain the most useful and meaningful outcome. It is, for example, recommended to begin as early as possible with the ESIA, ideally as a part of development planning in order to identify opportunities and constraints as early as possible and therefore to influence the design of a project (Carpenter & Maragos, 1989; Glasson et al., 2005). The process should be integrative and interdisciplinary by addressing the interconnectedness of social, economic and biophysical aspects (Carpenter & Maragos, 1989; Senécal et al., 1999). Furthermore, ESIA is a cyclical process and should continue to collect data throughout the project cycle, monitoring the implementation of environmental protection measures and, by being adaptive, incorporate lessons learned to suggest mid-course corrections to the management (Carpenter & Maragos, 1989; Glasson et al., 2005).

In theory, one can conduct a deep investigation of all possible links and interactions between each environmental and social sub-system. In practice, an intention like this is constrained by time, work force, financial means and data availability. Due to such constraints, a full ESIA was neither possible, nor intended within the scope of this research. Instead, using ESIA as basic framework, a preparative research towards a comprehensive and extensive ESIA was conducted, based on qualitative research methods and the review of documents, to investigate for the first time the potential impacts caused by a planned development on the environment, communities and conservation plans of the study area.

An early assessment of a proposed project using an “evaluation of the purpose, needs and alternatives is extremely important to identify resources, issues, other agencies, the affected public and directions to achieve the project purpose” (Carpenter & Maragos, 1989, p.24). Often, preliminary site and project evaluations deliver first useful results, by uncovering many unforeseen factors and leading to important changes of the project design in an early stage, when changes are still relatively easy to make (Carpenter & Maragos, 1989). These early changes “can help to avoid the need for expensive and time-consuming decisions to drop, relocate or redesign the project and force the need to accomplish more intensive in-depth studies” (Carpenter & Maragos, 1989, p.24).

As it is shown in the following flowchart (Figure 10), the process of the preparative research in hand constructed by the researcher for this study consists of seven different steps, which will be explained further below.

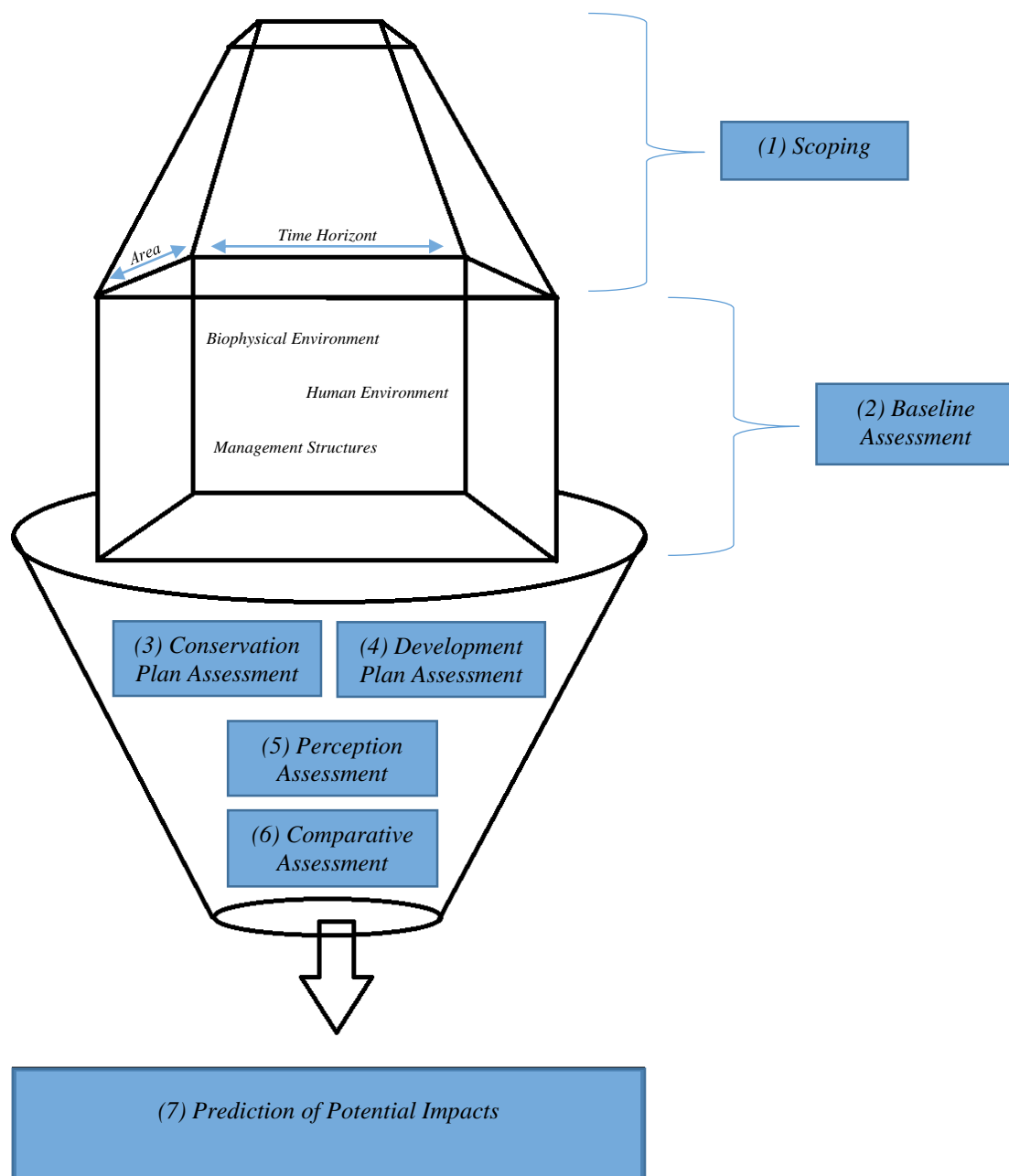


Figure 10: The researcher's framework for the preparative research in hand (Original figure by the author)

(1) *Scoping*: Time horizon and geographic boundaries of the assessment were set by the researcher as the first important step of the preparative research. Significant factors might not be included in case the scope is defined too narrowly. If the scope is too broad, on the other hand, the assessment can become an incomprehensible and unclear analysis and therefore miss its point (Carpenter & Maragos, 1989). Figure 11 shows the geographic boundaries of the assessment.

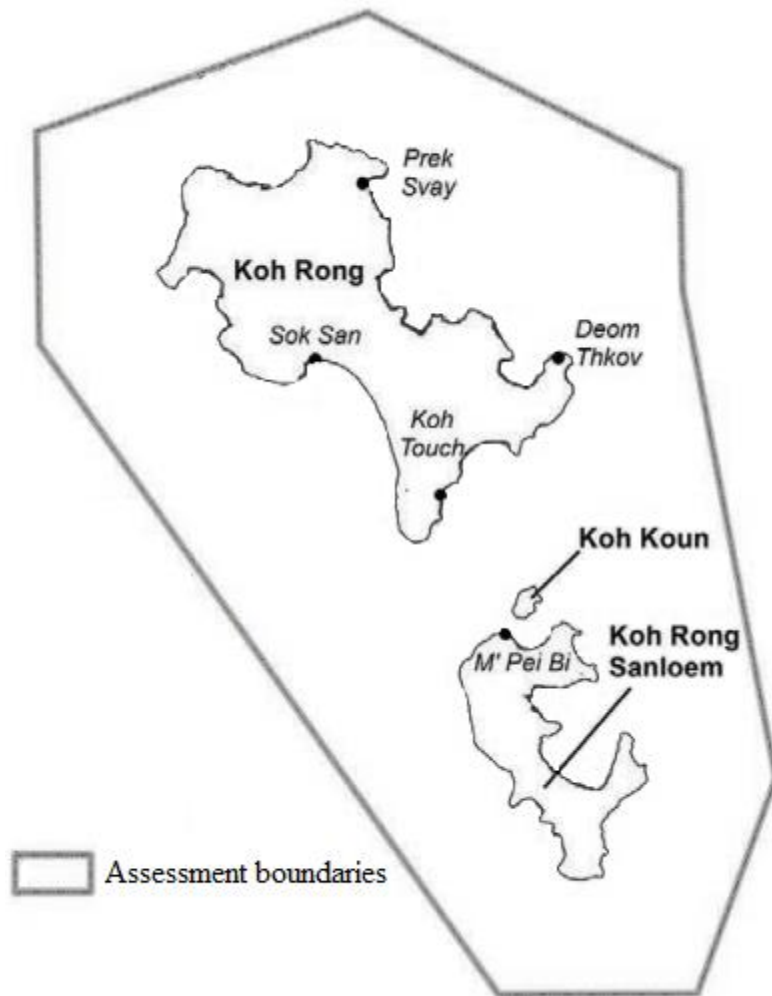


Figure 11: Geographic boundaries of the assessment (Boon et al., 2014, p.60, modified)

Planned within a coastal environment on a 24 km² relatively small sized island, it is especially important to consider the interconnectedness of terrestrial, coastal and marine ecosystems when setting the geographic boundary of the assessment. Coastal development is likely to have an effect on its bordering marine environment and therefore, the terrestrial area of Koh Rong and an additional 400 km² of surrounding marine area were included in the assessment, whereby the focus was on marine habitats around Koh Rong. The terrestrial area of Koh Rong Sanloem was not considered in the assessment.

The time horizon of the assessment includes prediction of potential future impacts associated to the development project throughout its lifetime, including construction phase and further operation. Acknowledging that the accuracy of predictions decreases rapidly with time, the researcher still chose to preliminary assess potential impacts occurring throughout the entire lifespan of the project to be able to cover the maximal number of possible impacts, which then might be specifically addressed in further impact assessments.

(2) *Baseline Assessment*: Predictions made on possible environmental and social impacts of a planned development project depend on the status and trends as well as on the understanding of cause-effect relationships of the study area's environmental and socio-economic characteristics (Carpenter & Maragos, 1989). Therefore, the researcher conducted a baseline assessment to outline the current environmental and socio-economic state of the study area. The baseline assessment provides an overview of the initial situation, which will function as reference point against which any future changes associated with the development can be measured. Furthermore, the baseline assessment offers information for subsequent monitoring and impact assessment activities in the study area (IFC, n.d.).

(3) *Conservation Plan Assessment*: The waters of the Koh Rong Archipelago are suggested to become “[...] a model MFMA for conservation of marine biodiversity, sustainable fishing and tourism, contributing to poverty reduction” (Mulligan & Longhurst, 2014, p 79). To understand whether and how the planned development will affect this intention of conservation, the proposed MFMA-plan was analysed by the researcher for its strategy, goals and intentions of resource use.

(4) *Development Plan Assessment*: Being the cause for this study, the researcher analysed the development plan to give a clear idea of the project and its characteristics. The following points were therefore analysed and formed the research questions for this thesis:

- What is the reason for the project?
- How will the project look like after it is fully realised?
- When will the project be implemented?
- Who is responsible for the project?
- How will the project be implemented?

(5) *Perception Assessment*: Making use of the local communities' knowledge about their living environment, the local population, community leaders, local businesses, NGOs and other agencies were asked about their perceptions towards the development project to gauge reaction, possible support or opposition to the development plans and the reasons for such opinions. Based on fundamental principles of democratic societies, such as transparency of decision-making and equity among the affected populations in terms of ethnic background and socio-economic status, the public should be involved as early as possible in the ESIA

and decision-making process (UNEP, 2008a). Therefore, additionally to the perception assessment, the researcher tried to find out the local population's opinions on how the planned development project could be revised to render it acceptable or supportable, where this was needed, and how they would like to be involved in the planning.

(6) Comparative Assessment: The study of similar existing projects often allows the assessor to already give a fair estimate of consequences (Carpenter & Maragos, 1989). To do so, a development project with a similar character was assessed, that is in the process of with some already finalised project components in an environment that prior to the beginning of the project's implementation was similar to that of this study's project's one. Therefore, a similar coastal tourism development project within the country's biggest national park and adjacent to the country's second proposed MPA was analysed for its environmental and social impacts.

(7) Prediction of Potential Impacts: The researcher used the information gained through the sub-assessments (2-6) to give estimations about future environmental and social impacts associated to the planned coastal development project, which will be presented in chapter 7.

5 Methodology

The researcher's background and personal interest in the study area, culture, communities and institutions, gained through previous involvement in a research project within the area, as explained earlier in chapter 1.2, provided the optimal precondition for the collection of primary qualitative data in form of participatory observations, personal observations as well as informal, unstructured and semi-structured interviews. Additional secondary data was gained through the review of documents. In total, the researcher spent eight months in the study area, of which four months were dedicated to the data collection for this research.

5.1 Participant Observation – Setting the Stage

As the foundation of cultural anthropology and a method of data collection commonly used by anthropologists doing fieldwork, participant observation allows the researcher to describe an existing situation by observing, participating and learning about the condition and activities within an area and its population in a natural setting (Erlandson, 1993; Bernard, 2006; DeWalt & DeWalt, 2011). Bernard (2006) describes participant observation as a process in which the researcher establishes a close connection to the community under study. The important factor thereby is that the researcher learns to adapt to the surroundings, blend into the community and act in such a way that its members will behave naturally. Additionally to observations, Bernard (2006) includes further methods of data collection in the process of participant observation, such as natural conversations and different sorts of interviews. It is important that the researcher is open-minded towards the community under study, attentively observing, carefully listening, being non-judgmental, and interested in learning, flexible and open for the unexpected while retaining objectivity (DeWalt & DeWalt, 2011). Furthermore, the application of certain amounts of manipulative deception and impression management, an “act of presenting a favourable public image of oneself” (Newman, 2009, p.181), is almost inevitable to make people feel comfortable in the researcher's presence and get them open up, enabling the observation and recording of information (Bernard, 2006).

Given the preparative nature of this research, participant observation was chosen in order to “develop a holistic understanding of the phenomena under study that is as objective and accurate as possible given the limitations of the method” (DeWalt & DeWalt, 2011, p.110). Conducted in an unfamiliar environment and cultural setting, the application of participant

observation gave the researcher an intuitive and intellectual idea of the way things are organised and prioritised, what functions and interests different stakeholders have and how they relate to one another (Schensul et al., 1999). Sensitive issues of political organisation, socioeconomic hierarchies and opinions about circumstances within the study area that were not easily addressed in public and therefore not visible for an outsider, became understandable to the researcher with continuous presence in the field and involvement with the community. Furthermore, the researcher gained cultural experience and knowledge that facilitated the continuous and developing discussion with informants.

According to Bernard (2006), in traditional anthropological field research, it can take up to a year or more to get a full grasp on the situation and community under study. However, it is possible and very common to conduct participant observation in much less time, especially when the researcher conducts the observations within a familiar setting. Bernard (2006) concludes that under the best conditions, it will take approximately three months for a researcher, starting out new as a non-member of a community, to get used to the physical and social layout of the study area and to be accepted as a participant observer. This first phase of entering the field was naturally carried out by the researcher within the four months spent in the study area prior to the data collection for this research. The researcher had time to settle down in the area, become familiar with the physical and socio-cultural environment, its organisation and structure, as well as get to know the different stakeholders in the area and gain the trust of the communities. By the time the data collection for this study began, the researcher had achieved first basic language skills in Khmer, the official language of Cambodia, through informal lessons with community members of M'pay Bay village on Koh Rong Sanloem, the community in which the researcher spent the most time. An open minded, curious and observant attitude, a first phase of mutual familiarisation and most of all, participation at a number of cultural events enabled the researcher to get involved in day-to-day activities such as fishing and construction work, contributing to the community life as a community member and therefore significantly reducing the reactivity of participants. However, for the purpose of this research, it was not only important to get a good insight knowledge of how the local communities in the study area work but also to experience and learn about the interests of conservationists and developers in the area.

Due to the researcher's contribution to a research project in line with the proposed MFMA and the continuous assistance and involvement in activities of the TWG-MFMA, the researcher gained access to the TWG and participated in monthly TWG-meetings and

therefore got the chance to consolidate relations to key-informants from the conservation-faction and got access to data and documents that usually would have been undiscovered. The researcher's personal interest in coastal issues also led to the invitation to monthly meetings of local NGOs, where the researcher got an overview of coastal and marine conservation-related activities within the study area. Contacts gained with the attendance of the monthly stakeholder meetings eventually opened doors for the researcher to get an insight view and first-hand impressions of a coastal development project in progress, during a one-week-long assistance at a construction site on a small Russian-investor owned island, not far from the study area. There, the researcher had the chance to overlook the on-going construction, live with the workers and supervisors and meet the developer, all as a full member of the developer-faction.

While being involved in diverse activities within the different factions of communities, conservationists and developers, the researcher always tried as much as possible to maintain a neutral position by underlining the study's neutral background and by emphasising that the purpose of the research was a holistic description of the area and therefore had little to do with someone's individual actions. Attempts to give an impression of the researcher's neutrality were simplified due to the fact that the research was done in the context of a Master's degree from the University of Akureyri in Iceland, an institution that could not be connected in any way to local interest groups.

To maintain a sense of objectivity throughout the data collection, the researcher arranged, as far as was practicable, rotating involvements phases within the different factions to gain renewed distance and therefore be able to consider the situation and collect information from a wider perspective. Where inevitable biases through assumptions, prejudices, opinions, and values were given, the researcher tried to minimise them by acknowledgment. With the time spent in the field and living with the local community, it got more and more difficult to maintain this objectivity. On one hand, the researcher developed a strong personal bond with the community; on the other hand, the different factions would soon have expected the researcher's full involvement. When that became the case, the researcher concluded the data collection after four month and left the field.

The continuous involvement in different community, conservation and development activities within the study area and the acquisition of knowledge and expertise about local conditions set the stage for the conduction of informative interviews with important key-informants of all factions and furthermore enabled access to relevant documents and

literature and allowed the researcher to conduct personal observations of the study area's environmental state throughout the time spent in the field.

5.2 Informal, Unstructured and Semi-Structured Interviews (Primary Data)

Especially when studying a sensitive issue or conflict, highly structured interviews can be inappropriate and make the respondent feel cornered by overly direct questions pressing for an answer (Bernard, 2006). Unstructured and semi-structured interviews on the other hand can be an ideal tool to steer an interview around the issue of interest and let the respondent freely express his or her opinion (Gillham, 2005; Bernard, 2006).

In order to obtain factual information, facilitating the performance of the different sub-assessments mentioned in chapter 4.1, the researcher conducted numerous unrecorded informal interviews as well as recorded unstructured and semi-structured interviews in the months of December 2014 to March 2015. The latter two interview types are chronologically listed and summarised in Table 2.

Table 2: Chronological list of anonymised unstructured and semi-structured interviews conducted for this study

Alias	Associated to	Type of interview
Respondent A	NGO	Unstructured
Respondent B	CB Richard Ellis (Cambodia) Co., Ltd.	Semi-structured
Respondent C	NGO	Unstructured
Respondent D	Local Village	Unstructured
Respondent E	Local Village	Unstructured (with translator)
Respondent F	Local Business (Tourism)	Unstructured
Respondent G	Local Business (Tourism/Real Estate)	Semi-structured
Respondent H	Authorities	Unstructured
Respondent I	International NGO (Environmental)	Unstructured
Respondent J	NGO (Human Rights)	Semi-structured
Respondent K	NGO (Land Rights)	Unstructured
Respondent L	NGO (Environmental)	Semi-structured
Respondent B	CB Richard Ellis (Cambodia) Co., Ltd.	Semi-structured

Unrecorded informal interviews, such as conversations with local business owners, NGOs staff members and fishermen go hand-in-hand with participant observation (Cohen & Crabtree, 2006) and were used mainly during the initial phase of the participant observation fieldwork to build greater rapport, gain a better overview and uncover new issues of interest

to the research. The conducted informal interviews were spontaneous, uncontrolled and unstructured. The researcher did not record the conversations in any way, nor were notes taken. The findings of the informal interviews therefore are based solely on the researcher's memory from these conversations when writing field notes at a later time. Even though the chosen method of unrecorded informal interviews implicates a number of disadvantages regarding the presumable loss of information, the researcher considered it as being necessary for the preparation of the conducted unstructured and semi-structured interviews as well as for the continuous implementation of participant observation.

Recorded unstructured interviews were the most frequently applied forms of interview. Interviewees and the researcher were familiar with each other and respondents were fully aware of being interviewed. While interviewing, the researcher followed a clear idea of issues to be addressed but left the interviewees unobstructed room to express themselves, intentionally minimising control over their answers and, in the words of Bernard (2006), enabling them to “open up and let them express themselves in their own terms, and at their own pace” (p.211).

Recorded semi-structured interviews were conducted in cases of the interviewee being a high-level employee or official, unfamiliar with the researcher and if the interview time was limited. The researcher thereby followed an interview guide with a written list of questions and matters that needed to be addressed while having the full control over the interview-course (Kvale & Brinkmann, 2009). However, researcher and respondent were free to follow new leads if necessary, to prevent important information from not being addressed.

All of the 13 interviews were conducted in English apart from one with a local villager. In this case, a community representative assisted the researcher as a translator. Four out of 12 respondents were native English speakers. Five out of eight non-English speakers were fluent in English so that they could express themselves in a clear and unmistakable way. Three of the respondents who were not fluent in English were very familiar with the researcher and therefore did not seem to feel uncomfortable with taking their time to think about the correct wording. Moreover, having rudimentary knowledge of the Khmer language and being used to elocution and pronunciation of the English language spoken by a Khmer person, the researcher was able to communicate more fluently with the respondents. Only one interview, conducted with an employee of a Cambodian human rights organisation, turned out to be unsuccessful due to the language barrier. In this case, the researcher and the interviewee were not familiar with each other and no translator was available. The

information gained through this interview was fragmented and mistakable and therefore not used for this study.

As an introduction to every unstructured and semi-structured interview, the researcher assured the interviewees of anonymity and confidentiality. In order to be able to focus on the topic and the dynamics of the interviews, the researcher recorded all unstructured and semi-structured interviews with the consent of the interviewee, using an audio recorder. Being aware of the potential intimidating effect of the presence of a recording device, the researcher used an ordinary mobile phone for the recording that was placed on the available surface, together with the researcher's materials. Additionally, the researcher took occasional notes during the interview, while making sure not to interrupt the free flow of the conversation.

It was emphasised that the purpose of the interview was to learn about the respondent's opinions, interests, observations and experiences. The aspect of *learning* from the interviewees was especially important and therefore particularly stressed. In one case, the interviewee feared that the information he or she was able to provide would not contribute to the research. After the researcher repeatedly expressed interest in learning from the respondent's knowledge and opinion, crucial information was obtained.

In cases when the interviewees were familiar with the researcher, it was further emphasised why especially their opinions, observations, interests and experiences on a particular topic were important to learn.

A number of different probing techniques were applied to stimulate respondents in order to produce more information, without much interaction from the researcher (Beed & Stimson, 1985; Suchman & Jordan, 1990; Bernard, 2006).

The most frequently used probing technique, however, was the *probing by leading* technique (Lofland, 1976). Mostly using the interviewee's last given information but also information gained earlier on in the field, the researcher continued to ask for the respondent's opinion about a certain topic, encouraging her/him to think more deeply, analytically and abstractly about an issue.

Another frequently used probing technique was the *phased assertion* method (Kirk & Miller, 1986) or *bating* technique, in the words of Agar (1973). When applying this technique, the researcher used pieces of information gained through informal interviews in the field to give the impression of already knowing more about a certain issue. This, in turn, appeared to

make interviewees more comfortable talking about a topic without feeling they were revealing new facts about a sensitive issue.

In social research, applying probing techniques is considered an ethical method to gain information from respondents (Gillham, 2005; Bernard, 2006). However, the researcher needs to acknowledge the responsibility to the respondents that is created with the decision to collect certain and sometimes sensitive information by applying probing techniques. The responsibility for what is done with the data lies with the researcher and respondents must be protected from having regrets about revealing information (Bernard, 2006; Kvale & Brinkmann, 2009).

Bernard (2006) noted that sometimes it is “better to stop an informant from divulging privileged information in the first or second interview and to wait until” researcher and interviewee “have built a mutually trusting relationship” (p.223). In one case, an interviewee contacted the researcher days after a conducted interview with the request to not mention his or her name in any way and to not use any of the information gained through the interview. In this case, the respondent might have revealed too quickly information that was too sensitive.

To verify the substance of information collected through the interviews and to test whether the gained information was potentially obtained specifically due to an interest-driven bias from a single informant, the researcher crosschecked if more of the twelve key-informants could reproduce the same information by asking the same questions about a certain topic to multiple informants.

The chronology of conducted interviews, as seen in Table 2, was purposely chosen and arranged. An initial interview with an associate of a local NGO was used to give the researcher a good overview and understanding about the current situation and recent development trends within the study area. There followed the first of two conducted interviews with the developer to obtain first-hand information about the planned coastal development project on Koh Rong. With an idea of the development plans, the researcher conducted several interviews with local stakeholders including conservation groups, villagers, businesses, developers and officials from the TWG-MFMA, to evaluate potential conflicts of interest and potential environmental and social impacts in the study area, associated to the planned coastal development. Furthermore, the researcher consulted experienced members of Cambodian human rights and land rights organisations as well, to obtain their opinion on potential impacts. For the comparative assessment, an associate of

an environmental NGO in a reference area was interviewed. A second interview with the developer was conducted conclusively to discuss information that the researcher gained throughout the numerous interviews.

In order to analyse the collected data, all 13 recorded structured and semi-structured interviews were transcribed and printed out by the researcher. Different colours were then assigned to the respective sections of the printed transcriptions that touched upon different specific areas of issue. By doing so, the extraction of relevant information that was needed for the conduction of the different assessments of this study was facilitated. Appendix B contains a list of topics that were discussed within the recorded unstructured and the semi-structured interviews.

5.3 Review of Documents (Secondary Data)

Often, the data collection methods of participant observation, interviews and personal observations, as conducted for this study, are complemented by a researcher's review of relevant documents (Marschall & Rossmann, 2006). Being crucial for the performance of the research's sub-assessments shown in chapter 4.1, the researcher reviewed literature and documents regarding the demography, geography, the environment and management of the study area. The specific reviewed documents are listed in Table 3, pointing out the character of the used data, the title of the document and its source.

Table 3: List of documents reviewed by the researcher

Data	Title	Source
Biophysical and demographic baseline data	Research & Recommendations for a Proposed Marine Fisheries Management Area in the Koh Rong Archipelago	Mulligan & Longhurst, 2014
MFMA goals	Fact Sheet handed out on TWG-MFMA meeting	TWG-MFMA meeting, 2015
Seagrass distribution	Seagrass diversity and distribution in the Koh Rong Archipelago, Preah Sihanouk Province, Cambodia	Leng et al., 2014
Environmental Baseline Data	Zoning Cambodia's first Marine Fisheries Management Area.	Boon et al., 2014
MFMA Management	Sustainable Financing and Benefit-Sharing for the Koh Rong Archipelago Marine Fisheries Management Area	Hasting & Yeng, 2014
MFMA Management	Management Plan for the Koh Rong Archipelago Marine Fisheries Management Area	TWG-MFMA meeting, 2015
Demographics	Sustainable Financing for the Koh Rong Archipelago Marine Fisheries Management Area: Willingness to Pay Survey Results	Hasting et al., 2015
Socio-demographics	Summary report on Koh Rong and Koh Rong Samloem Fishing Communities	Vibol et al., 2011a

According to Jensen and Ing (2014), important information has been collected in recent years through extensive surveys of marine and coastal ecosystems around Koh Rong in line with

multiple NGO-supported projects. This collection of data, however, is often done in a not well-coordinated manner and “ends up as a pile of glossy paper reports on bookshelves” (Jensen & Ing, 2014, p.3). Due to involvement in the study area and the time spent in the field, the researcher gained access to a number of these “bookshelves” and therefore was able to gain essential data, especially important for sub-assessment 2 and 3, the baseline assessment and the conservation plan assessment.

5.4 Limitations of the Study

The limitation of the presented study concerns the inevitable potential disregard of information due to reasons that are explained in the following.

5.4.1 Language

Even though the researcher took measures to adapt to the given cultural settings along with the applied method of participant observation, the researcher was not able to communicate with the local population on their mother tongue. Information from local villagers might therefore be remained unexplored. The same issue concerns the information that potentially could have been obtained from other sources such as certain local authorities and employees of Cambodian NGOs, as the researcher had to constrain the pool of interviewees to English-speaking respondents (apart from one interview, conducted with a local villager, were a translator assisted). Written documents concerning the study area are for the most part available in English-language. However, also here some information might have been remained unexplored.

5.4.2 Sensitive Issue

To encounter the issue of missing out on information due to the sensitive character of the examined resource conflict and the presumable resulting restraint of respondents to freely discuss the issue, the researcher applied a number of strategies and methods, as explained in chapter 5. However, it is likely that not all restraints of respondents were overcome and therefore information might have stayed undiscovered.

5.4.3 Number of Conducted Interviews and Time Spent in the Field

Beyond doubt, a larger number of conducted interviews combined with a longer time spent in the field would have uncovered additional information. However, being a preparative research towards a comprehensive and extensive ESIA, the research's aim is to preliminary assess potential impacts of the planned development in order to facilitate near-term reactions.

5.4.4 Unavailability of Environmental and Social Impact Assessments

The provision of allegedly conducted ESIA's of the Royal Group's masterplan would have enabled the researcher to elaborate on more specific issues concerning the potential negative and positive effects of the planned development on the study area's environment and population. All efforts by the researcher of contacting the company that was in charge of the conducted ESIA as well as the Royal Group itself in order to trace down such assessments remained fruitless. Further details to the issue will be explained in chapter 6.3.

6 Results

6.1 Baseline Assessment

6.1.1 Biophysical Environment

The following chapters are an assessment of the status, usage, threats and existing regulations about the study area's habitats of particular ecological importance and their inhabiting species.

Coastal Forests and Mangroves

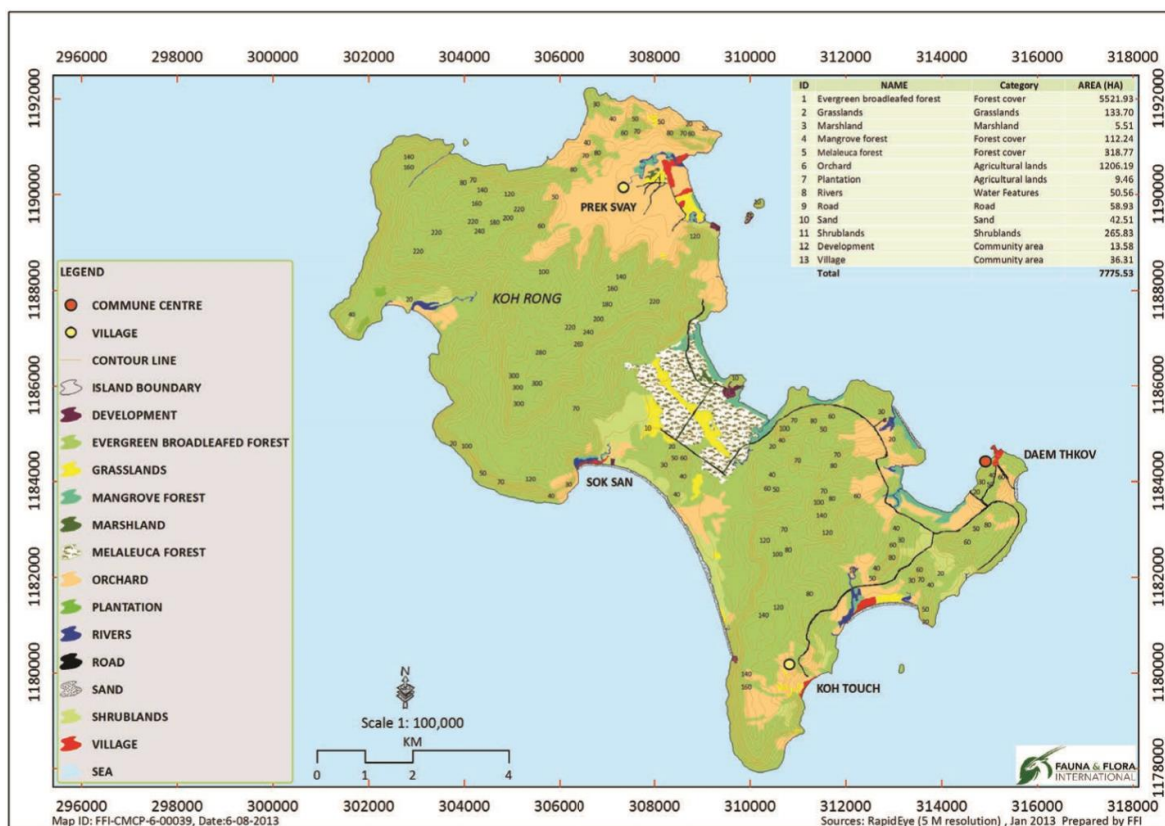


Figure 12: Land use map for Koh Rong derived from ground-truthed satellite imagery from 30th January 2013 (Mulligan & Longhurst, 2014, p.46-47)

Coastal Forests

The dominating forest of the Koh Rong Archipelago is classified by IUCN as lowland evergreen forest (BirdLife International, 2003). By using ground-truthed 5m resolution RapidEye satellite imagery, Mulligan & Longhurst (2014) estimated the total area covered by broadleaved evergreen forest in 2013 to be around 5,500 hectares, which equals to about 74% of the island, as seen in Figure 12.

The species composition of forests within the archipelago is better known for Koh Rong Sanloem than for Koh Rong. However, due to their geographical vicinity and similarity in environmental conditions, the species diversity of forests is assumed to be homogeneous (Respondent I). Table 4 lists the most dominant species of the archipelago's evergreen forest, mentioned in reports by the Koh Rong Sanloem Island Resorts Co., Ltd (KRSIR, 2011) and Mulligan and Longhurst (2014), containing species listed on the IUCN Red List as endangered, such as *Hopea pierrei* (Ashton, 1998a), and critically endangered, such as *Shorea hypochra* (Ashton, 1998b).

Table 4: Dominating species of the archipelago's evergreen and sub-evergreen forests (KRSIR, 2011; Mulligan & Longhurst, 2014)


Evergreen forest		Sub-evergreen forest	
Family	Species	Family	Species
Dipterocarpaceae	<i>Hopea pierrei</i>	Myrtaceae	<i>Syzygium</i> sp.
	<i>Shorea hypochra</i>	Malvaceae	<i>Thespesia populnea</i>
Clusiaceae	<i>Garcinia</i> sp.	Fabaceae	<i>Peltophorum dasyrrhachis</i>
	<i>Calophyllum</i> sp.	Moraceae	<i>Fucus hispida</i>
Myrtaceae	<i>Syzygium zeylanica</i>	Rutaceae	<i>Murraya</i> sp.
	<i>Urgenia</i> sp.		
Chrysobalanaceae	<i>Parinaria annamensis</i>		
Irvingiaceae	<i>Irvingia malayana</i>		
Simaroubaceae	<i>no data</i>		
Sapotaceae	<i>no data</i>		
Meliaceae	<i>Aglaia spectabilis</i>		
Fabaceae	<i>Parkia sumatrana</i>		
Myristicaceae	<i>Knema corticosa</i>		

Figure 13: Coastal forest of Koh Rong (credit: The Royal Group/photo by unknown)

Smaller sub-evergreen forests are growing on the islets around Koh Rong such as those located on the north-eastern coast (Mulligan & Longhurst, 2014). Dominating species of those are also listed in Table 4. The low-lying central plain is vegetated by around 320 hectares of melaleuca forest dominated by *Melaleuca* sp. (Mulligan & Longhurst, 2014). Selective logging of valuable timber species within Koh Rong's evergreen forests took place between 1980 and 1990, according to local reports obtained by Sophat and Reasey (2010). Additionally, forest has been "clear-cut for agricultural purposes including rain fed rice and upland crop farming" (Sophat & Reasey, 2010, p.82). Low-level opportunistic and selective logging is occasionally carried out by the local population and the wood is used locally as building material for the construction and repair of houses and piers (Mulligan & Longhurst, 2014). By combining land-cover maps from 1997 and 2013, Mulligan and Longhurst (2014)

estimated that within these 16 years the evergreen forest cover of Koh Rong decreased by approximately 20%. Figure 14 shows the forest loss on Koh Rong between 2000 and 2014 (Hansen et al., 2015). The map is part of the results from time-series analysis of Landsat images characterizing global forest extent and change, created by Hansen et al. in 2015.

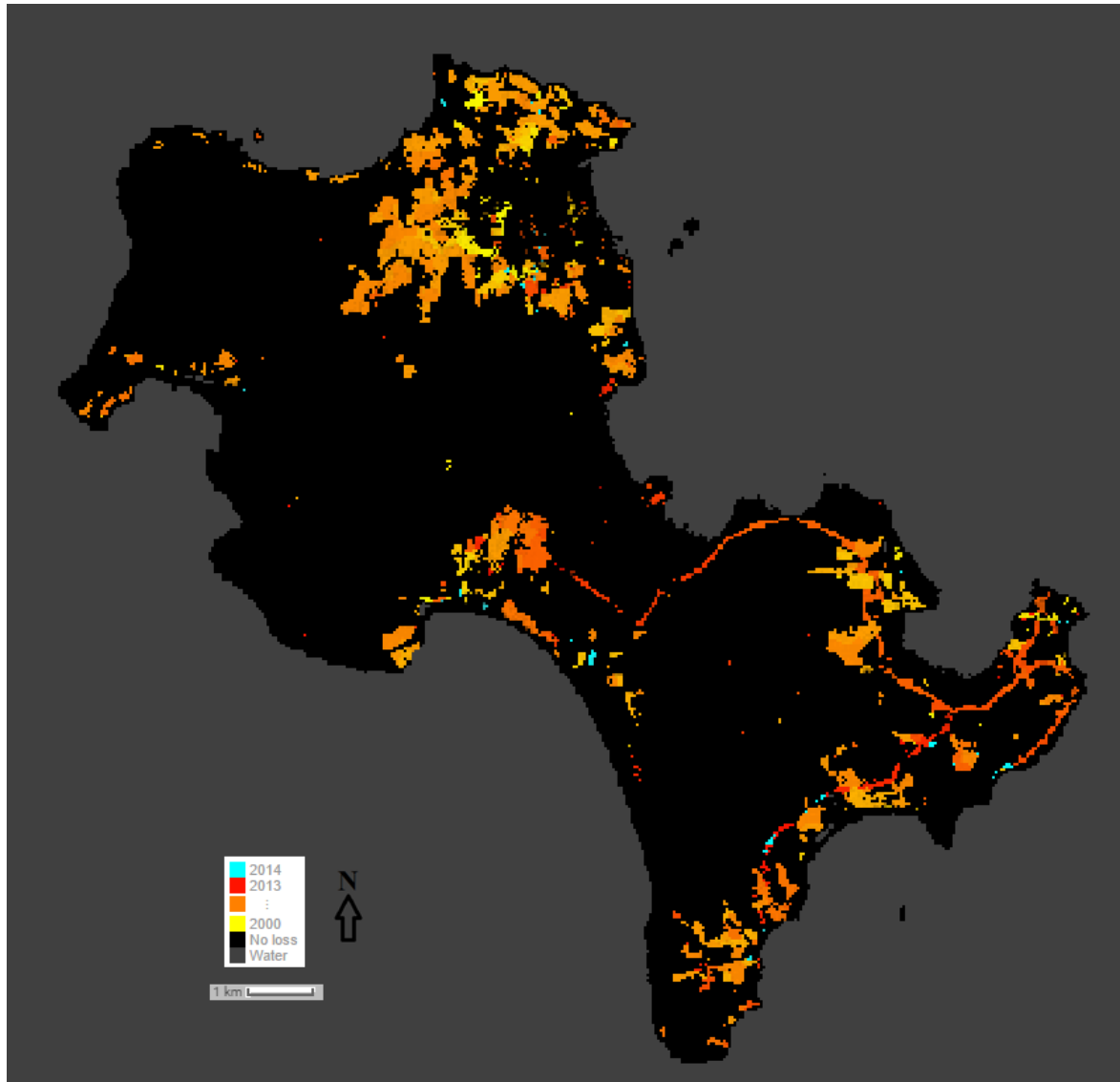


Figure 14: Loss of forest cover in the study area between 2000 and 2014 (Hansen et al., 2015)

Clearly identifiable is the conversion of forest along the south-eastern coast due to tourism related infrastructure and roadwork. Another recognisable location of increased forest loss lies around the village of Sok San situated on the west coast. Here the conversion might be connected to recent infrastructure development related to the Royal Group's activities (Respondent B). The part of the island that seemingly saw the most forest clearings in the past is the north-east. Here, it is related to the creation of field and orchards for food

production by the inhabitants of Prek Svay, the largest village on Koh Rong (Respondent D).

Mangrove forests

A number of land use maps indicating mangroves on Koh Rong are available (SCW, 2006; Sophat & Reasey, 2010; Skopal-Papin, 2011). Mulligan and Longhurst (2014) suggest that the data and indications of the available maps, however, vary greatly from each other. Mulligan and Longhurst (2014) suggest, furthermore, that important patches of mangrove have not been considered for the preparation of the existing maps and in addition, some misclassification of vegetation types falsify the given indications of mangroves.

While the overall distribution and species composition of the Koh Rong Archipelago's mangrove forests remains poorly documented, the health of the trees is thought to be good (Mulligan & Longhurst, 2014). According to information that Sophat and Reasey (2010) gained from a number of social surveys, local people identified the following six mangrove species growing on Koh Rong: *Rhizophora apiculata*, *Rhizophora mucronata*, *Avicennia marina*, *Bruguiera gymnorrhiza*, *Bruguiera sexangula* and *Ceriops* sp., as listed in Table 5.

Table 5: Species composition of mangrove trees within the study area, based on findings by Sophat and Reasey (2010)

Mangrove forest		
Family	Species	
Rhizophoraceae		<i>Rhizophora apiculata</i>
		<i>Rhizophora mucronata</i>
		<i>Bruguiera gymnorrhiza</i>
		<i>Bruguiera sexangula</i>
		<i>Ceriops</i> sp.
Acanthaceae		<i>Avicennia marina</i>

Figure 15: Mangrove trees on Koh Rong (photo by Kienitz, T.)

By using ground-truthed 5m resolution RapidEye satellite imagery, Mulligan & Longhurst (2014) estimated the extent of mangroves forest to 112 hectares on Koh Rong, as seen in Figure 12. These forests are mostly distributed in small stands along the east coast of the island and reaching further inland along most creeks (Mulligan & Longhurst, 2014).

The largest continuous block of mangrove forest is located inside a bay on the eastern part of the island and it is believed to be supported by the adjacent melaleuca forest, with *Melaleuca leucadendra* growing in the hinterland of the mangrove swamps (Mulligan & Longhurst, 2014). Small patches were cleared here in the past (Mulligan & Longhurst, 2014) presumably for charcoal production (Sophat & Reasey, 2010). The same goes for mangrove forests situated nearby the village Koh Touch (Mulligan & Longhurst, 2014).

The FiA acknowledges the ecological importance of mangroves as fish nursery areas, erosion control and protector of coral reefs and seagrass beds from siltation and eutrophication by absorbing surplus nutrient run-offs (MFF, 2013) and therefore prohibits cutting, reclaiming, digging out, clearing, burning or occupying mangrove forests with Article 28 of the 2006 Law on Fisheries (FiA, 2007a).

Even though the overall local utilisation of mangroves within the Koh Rong Archipelago is not well understood, clear-cutting or harvesting of mangrove trees, if performed in current manner, is not believed to cause significant habitat loss and is likely to continue while poorly planned coastal development poses the bigger threat (Mulligan & Longhurst, 2014).

Hydrology

Information about the island's hydrology solely exists in form of local knowledge due to the fact that so far no research has been conducted on the topic, at least none that is available for the public. However, the island's geographical and botanical characteristics such as morphology, vegetation and natural fresh water discharge rates allow the assumptions of certain hydrological properties.

According to a local villager (Respondent D), freshwater on Koh Rong is available through conventional water sources including surface water, ground water and precipitation water collected from artificial or natural surfaces. Surface freshwater is derived for human consumption from several streams and creeks originating from the elevations on the island (pers. obs.). Occasionally groundwater is made available through a number of wells. Due to the island's relatively small size and some higher elevations, the occurring vegetation presumably plays an important role in retaining precipitation water and therefore facilitating groundwater recharge. However, the water resources of islands are in general very limited and fragile with relatively short turnover times (Falkland, 2002). That seems to be the case for Koh Rong, as four respondents reported to the researcher that annual freshwater shortages occur during dry seasons, with February to April being the most critical period (Respondent A; Respondent C; Respondent D; Respondent E). Groundwater recharge through rainwater occurs between May to October with higher precipitation rates during the wet season.

Coral Reefs and Seagrasses

Coral Reefs

Cambodia's coastal zone is known to have a high abundance of fringing coral reefs (Chou et al., 2003), which are declared as protected by Article 28 of the 2006 Law on Fisheries (FiA, 2007a). The overall status and condition of this reef system, however, is poorly researched and documented (Van Bochove et al., 2012). In recent years, an increasing number of NGOs and private sector companies conducted surveys on coral reef ecosystems, using independent monitoring strategies (Thorne & Longhurst, 2013).

Thorne et al. (2015) estimated that the study area comprises 468 hectares of coral reef, which is equal to 17% of Cambodia's coral reefs. The most extensive and reliable data on coral reefs within the Koh Rong Archipelago was collected by the U.K.-based NGO Coral Cay Conservation during a research project from 2010 to 2012, commissioned by the Fisheries Administration (FiA) of the Ministry of Agriculture, Forestry and Fisheries (MAFF), to collect baseline data for the proposed MFMA (Van Bochove et al., 2012).

By applying the Reef Check methodology, CCC surveyed 87 sites around Koh Rong in order to collect data about substrate types, reef condition as well as fish and invertebrate abundance, diversity and composition (Van Bochove et al., 2012).

The dominant substrates found were rock, sand and live hard coral with hard coral cover averaging around 20% (Van Bochove et al., 2012). Figure 16 shows the percentage of hard coral cover at all CCC survey sites.

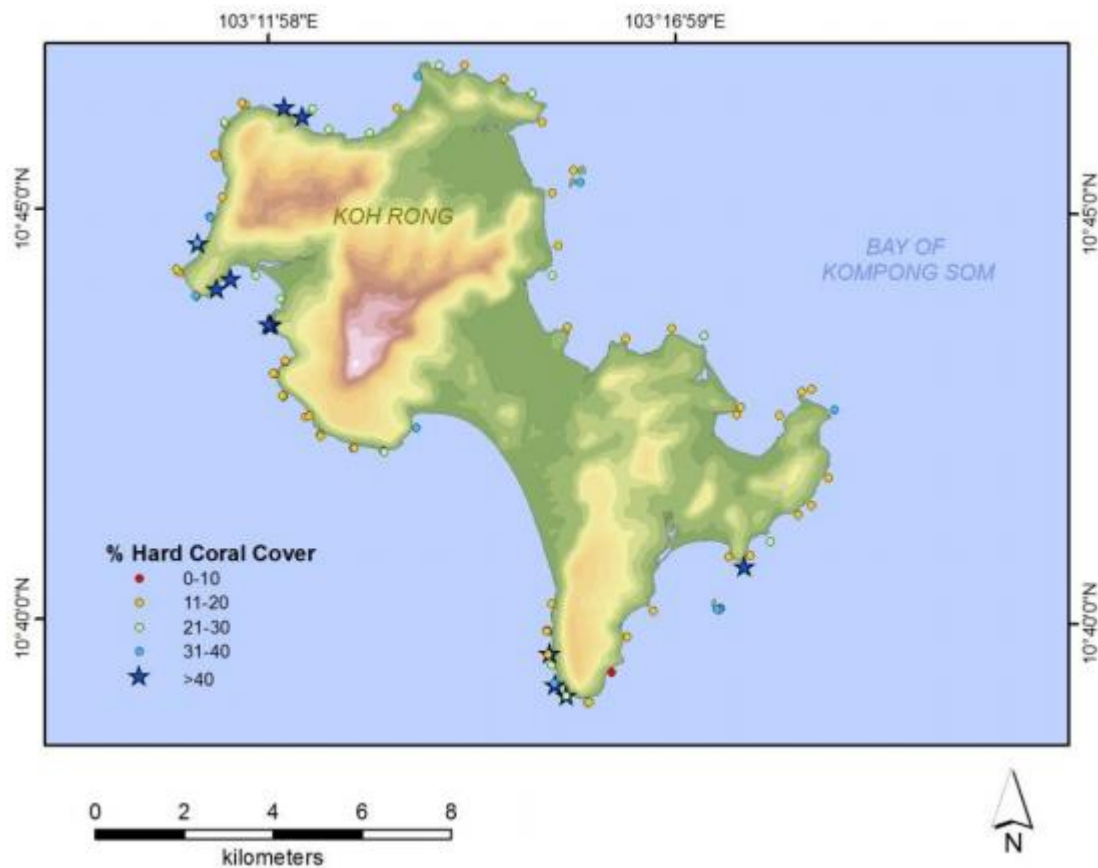


Figure 16: Hard coral cover at CCC survey sites (Longhurst & Clay, 2013, p.41, modified)

As seen in Figure 16, the north-western coast and the south-western tip of Koh Rong hold the highest live hard coral cover rates with up to 48% (Van Bochove et al., 2012). The eastern coast shows the lowest coral cover rates ranging between 7%-20%. A reason for the lower rates along the eastern coast could be that the prevailing substrate in this area is sand and therefore not suitable for the colonisation of corals (Van Bochove et al., 2012). Another factor potentially affecting coral cover on the eastern side is sediment run off from the main land, which is located approximately 20 km further to the east (Van Bochove et al., 2012). The species diversity across the reefs around Koh Rong seems to be fairly low with dominating robust massive or encrusting life forms, such as *Porites* sp., *Diploastrea heliopora*, *Favites* sp. and *Favia* sp., covering about 57% of the coral reef across all sites (27%, 13%, 10% and 7% respectively) (Van Bochove et al., 2012). Figure 17 shows common coral growth forms in the study area while Figure 18 shows a typical reef within the Koh Rong Archipelago dominated by *Porites* sp.

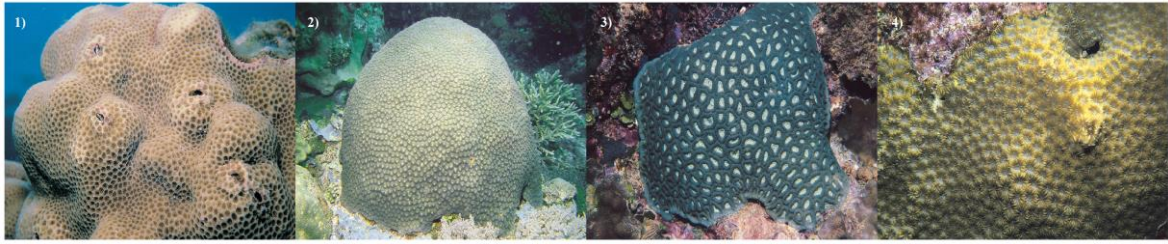


Figure 17: Common coral species within the study area: (1) *Porites* sp., (2) *Diploastrea heliopora*, (3) *Favia* sp. and (4) *Favites* sp. (credit: AIMS/photos by Stafford-Smith, M (1), Allen, G. (2) & (3) and Veron, C. (4))



Figure 18: Reef within the Koh Rong Archipelago dominated by *Porites* sp. (photo by Kienitz, T.)

While Van Bochove et al. (2012) see a potential reason for habitats dominated by massive and encrusting coral forms in high sedimentation rates, other studies associate a greater abundance of branching forms with heavy sedimentation (Rogers, 1990). However, compared to other massive coral types, *Porites* sp. is often observed to be relatively tolerant to high levels of sedimentation (Lasker, 1980; Rogers, 1990) and some species like the *Porites astreoides* were even found to be one of the most abundant species in heavily sediment run-off affected areas in Central America (Morelock et al., 1983; Cortés & Risk, 1984). Another reason for the low density of tabulate and branching coral forms could be their susceptibility to wave induced stress (Baldock et al., 2014), affecting them especially in shallower areas during the south-westerly monsoon winds dominating from April

throughout October (Krell et al., 2011). Highest coral diversities are situated in deeper areas of the north-western coast and the south-western tip of Koh Rong (Van Bochove et al., 2012). The rate of recently killed coral was found to be low around Koh Rong with less than 1% (Van Bochove et al., 2012). Similar low rates throughout the area were found for nutrient indicator algae, soft coral and sponge (2%, 2% and 7% respectively) (Van Bochove et al., 2012). Anthropogenic impacts on coral reefs are relatively low with mostly lost fishing gear and other damage- causing trash (Van Bochove et al., 2012; pers. obs.).

Diversity and abundances of fish and invertebrate species were the highest in areas of high coral cover and diversity, i.e. along the north-western coast and the south-western peninsula (Van Bochove et al., 2012). Longhurst and Clay (2013) analysed the data collected by Van Bochove et al. (2012) regarding a number of ecological indices such as coral, fish and invertebrate abundance and diversity in order to assign different areas a conservation management value and to highlight reef areas of particular biological interest around Koh Rong. By combining sites with high conservation management value and sites with particularly high values for individual indices, Longhurst and Clay (2013) were able to identify coral reef key areas of conservation interest as shown in Figure 19.

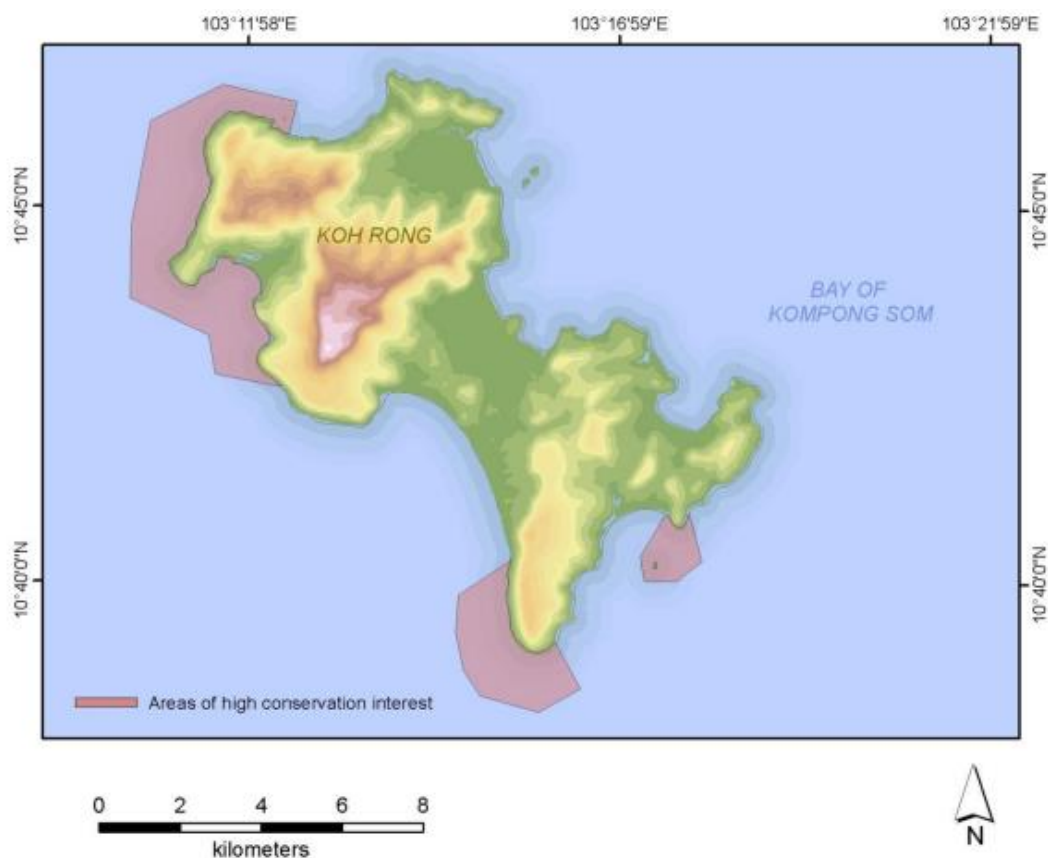


Figure 19: Areas of high conservation interest for coral reefs (Longhurst & Clay, 2013, p.42, modified)

It is important to keep in mind that the areas of conservation interest shown in Figure 19 relate only to coral reef habitats. Other habitat types such as seagrass beds or mangroves are not considered.

Seagrasses

Similar to studies about coral reefs in Cambodia, there was little research done about seagrass habitats located around the country's off shore islands (Leng et al., 2014). A report by the United Nations Environmental Programme states that according to district fisheries officials, large areas of seagrass once occurred in Kampong Som Bay, which is the location of the Koh Rong Archipelago (UNEP, 2008b). However, seagrass distribution and abundance have decreased significantly due to destructive fishing methods such as bottom trawling and push netting (UNEP, 2008b).

The same trend is seen for the seagrass beds within the study area. While seagrass distribution maps from 2006 show 94 hectares of seagrass beds around the Koh Rong Archipelago (SCW, 2006), a report by Skopal-Papin from 2011 suggests only 47 remaining hectares. The most recent data on seagrass beds within the Koh Rong Archipelago was collected by Leng et al. (2014) in line with environmental data collection efforts in preparation for the proposed MFMA. Leng and her team (2014) therefore comprehensively assessed seagrass beds within the Koh Rong Archipelago in 2013 and 2014 by conducting surveys on selected sites to evaluate distribution, abundance, and for the first time, species composition of seagrass around the islands. It was estimated that the whole archipelago contains about 18 hectares of seagrass beds located on coarse sand substrate and predominantly associated with fringing mangroves, consisting of *Halodule pinifolia*, *Thalassia hemprichii*, *Enhalus acoroides* and *Halophila minor* with *Halodule pinifolia* being the most common (Leng et al., 2014). The four species are depicted in Figure 20.

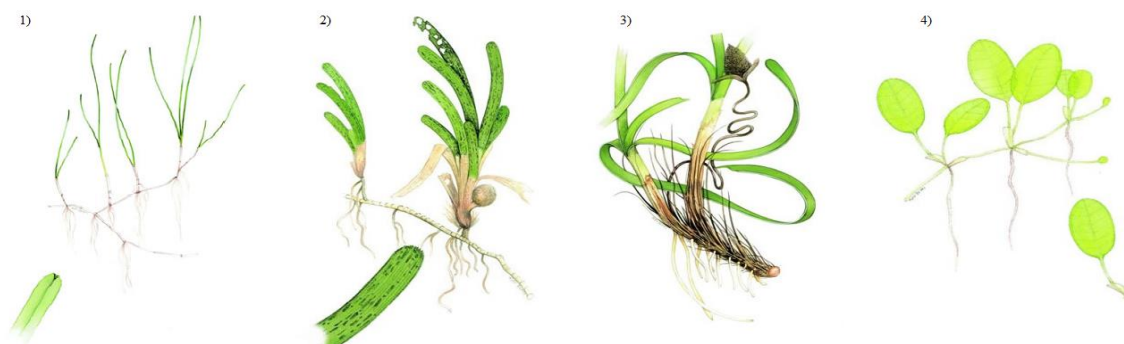


Figure 20: *Halodule pinifolia* (1), *Thalassia hemprichii* (2), *Enhalus acoroides* (3) and *Halophila minor* (4), (Seagrass-Watch HQ, 2006-2013)

Figure 21 shows the seagrass distribution around Koh Rong, as assessed by Leng et al. (2014).

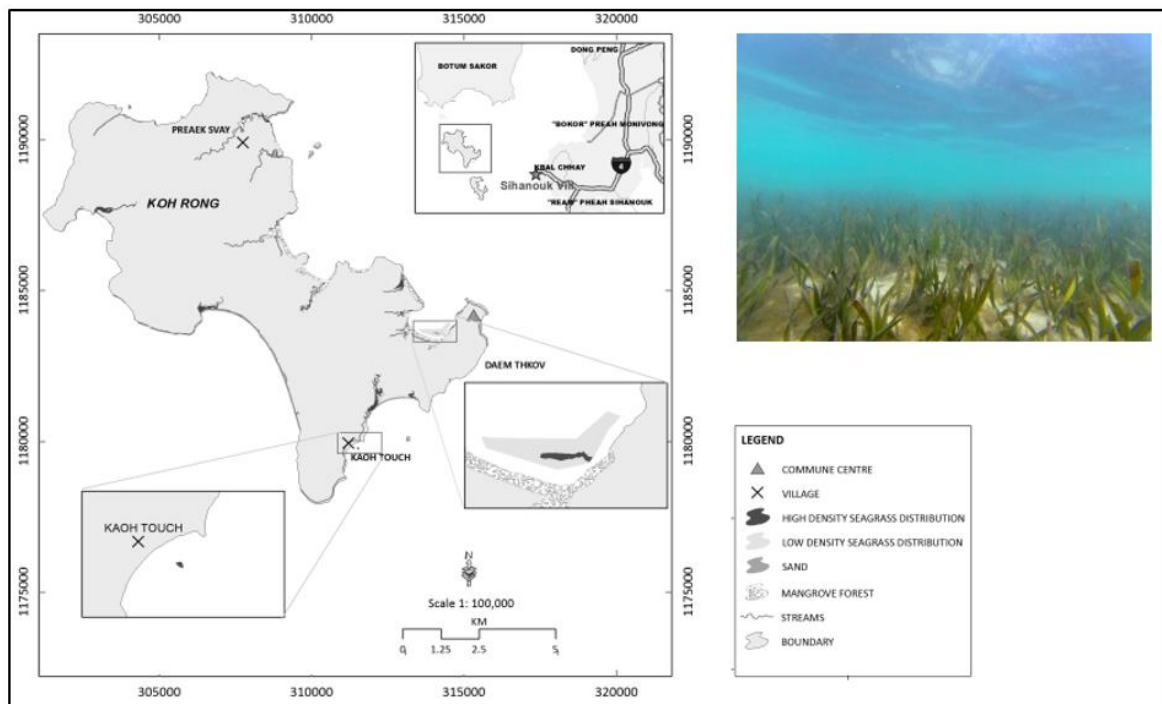


Figure 21: Estimated extent of seagrass beds (Leng et al., 2014, p.40, modified) and seagrass bed with *Enhalus acoroides* around Koh Rong (top right) (credit: Go Dive Cambodia/photo by unknown)

With an area of about 10 hectares, the largest and potentially most significant remaining seagrass bed is located in a sheltered bay on the south-eastern coast of Koh Rong, close to the village Daem Thkov, where all four seagrass species were recorded in 2013, and three species recorded in 2014, dominated by *Halodule pinifolia* (Leng et al., 2014; Mulligan & Longhurst, 2014). In general, seagrass beds within the study area are predominantly associated with fringing mangroves (Leng et al., 2014).

As mentioned earlier, anthropogenic impacts on seagrass beds seem to be high within the study area and mostly due to fishing efforts such as inshore bottom trawling (Leng et al., 2014). Mulligan & Longhurst (2014) also suggest that land based pollution may have an additional negative impact on seagrass beds, especially near the rapidly growing and developing village of Koh Touch.

Article 52 of the 2006 Law on Fisheries, implemented by the FiA, puts seagrass under protection against any destructive forms of exploitation, including imposing of high fines for damaging seagrass beds (FiA, 2007a), acknowledging their role of providing crucial habitats for several endangered and vulnerable fish and aquatic species (Sereyath &

Sokhannaro, 2003), supporting local fisheries as nursery ground for commercial valuable species (Unsworth et al., 2007), maintaining water quality by absorbing nutrients and preventing erosion by stabilising sediments and reducing wave and current energy (Short et al., 2002; UNEP, 2008b).

Terrestrial and Marine Fauna

Terrestrial fauna

Information about terrestrial fauna does almost only exist in the form of local knowledge and reports. Preliminary and superficial baseline surveys were conducted in 2011 by Fauna & Flora International, on behalf of Koh Rong Sanloem Island Resorts Co., Ltd (Lewis & Kunthear, 2010; KRSIR, 2011), the concessioner of large parts of Koh Rong Sanloem, and by a team of students from the UK and Cambodia in 2013 (Toulson et al., 2013). These surveys were conducted solely on Koh Rong Sanloem. However, due to the geographical vicinity and similarity in environmental conditions of Koh Rong Sanloem and Koh Rong, it is very likely to encounter most species on both islands.

During both surveys, 59 migratory and non-migratory bird species were identified, listed in the expedition report by Toulson et al. (2013), including the oriental pied hornbill (*Anthracoceros albirostris*), osprey (*Pandion haliaetus*) and the white-bellied sea eagle (*Haliaetus leucogaster*) shown in Figure 22.



Figure 22: (1) *Anthracoceros albirostris* (credit: IBC/photo by William, I.P), (2) *Pandion haliaetus* (credit: University of California/photo by Avise, J.C.) and (3) *Haliaetus leucogaster* (credit: IBC/photo by Taylor, D.)

The occurrence of key-biodiversity species and the globally near threatened Malaysian plover (*Charadrius peronii*) (BirdLife International, 2012), has led to the creation of the Koh Rong Important Bird Area (Koh Rong IBA) in 2003, implemented by BirdLife International as part of the BirdLife Indochina Programme (BirdLife International, 2003).

Thirteen reptile species were identified by Toulson's team (2013), also listed in the Koh Rong Sanloem Expedition Report. Personal observation by the researcher of this study, information collected from the local population and the survey results of Fauna & Flora International (KRSIR, 2011) suggest, that additionally to the species mentioned in Toulson's report (2013), reticulated pythons (*Python reticulatus*), the world's largest snakes and king cobras (*Ophiophagus hannah*), the world's largest venomous snakes occur on the islands, both shown in Figure 23, as well as other smaller cobras, kraits, vipers and tree snakes.



Figure 23: (1) *Python reticulatus* (credit: Colorado State University/photo by Lardner, B), (2) *Ophiophagus Hannah* (credit: Vickers, T./photo by Vickers, T.)

The island's streams are home to the Asian leaf turtle (*Cyclemys atripons*), as well as to a number of frogs, including the endemic Kohchang frog (*Limnonectes kohchangae*) (KRSIR, 2011), and one toad species (*Bufo melanostictus*) (Toulson et al., 2013). The only still existing larger mammals, native to the archipelago, are long-tailed macaques (*Macaca fascicularis*), common palm civets (*Paradoxurus hermaphroditus*) and the Sunda pangolin (*Manis javanica*).

Only two of the species mentioned above are listed on the IUCN Red List as threatened species. The Sunda pangolin (*Manis javanica*), is listed as critically endangered (Challender et al., 2014) and almost extinct from the archipelago due to hunting pressure (local villager, per. comm., 2015) and the king cobra (*Ophiophagus hannah*), is listed as vulnerable (Stuart et al., 2012).

Invertebrates were not considered for this study.

Marine Fauna

Due to multiple NGO-supported projects and increased effort of data collection as part of preparations for the proposed KRA-MFMA, the marine fauna of the study area is better

researched than the terrestrial fauna. This study will therefore focus solely on endangered marine fauna inhabiting the area.

According to Mulligan and Longhurst (2014), at least ten taxa (eight species, one genus and one class) of reliably recorded marine organisms within the study area are listed in Anukrat 123, a sub-decree identifying 58 taxa of different taxonomic ranks of nationally endangered aquatic organisms for increased legal protection. Table 6 shows the ten endangered taxa (eight species, one genus and one class) registered in Anukrat 123, as listed in Mulligan & Longhurst's report (2014) (p.55).

Table 6: Endangered taxa registered in Anukrat 123, as listed in Mulligan and Longhurst's report (2014) (p.55)

#	Anukrat 123 categorisation	Species records	IUCN categ. ⁵	Last sp. record
31	Dugong (<i>Dugong dugon</i>)		VU	2005
32	Humphead wrasse (<i>Cheilinus undulates</i>)		EN	2011
33	False killer Whale (<i>Pseudorca crassidens</i>)		DD	2001
36	Irrawaddy dolphin (<i>Orcaella brevirostris</i>)		VU	2009
43	Green turtle (<i>Chelonia mydas</i>)		EN	2013
44	Hawksbill turtle (<i>Eretmochelys imbricata</i>)		CR	2014
51	Giant clam (<i>Tridacna gigas</i>)		VU	2013
54	Seahorse (<i>Hyppocampus</i> spp.)	<i>H. kuda</i>	VU	Unknown
		<i>H. trimaculatus</i>	VU	Unknown
		<i>H. spinosissimus</i>	VU	2013
		<i>H. comes</i>	VU	unknown
		<i>H. kelloggi</i>	VU	2013
		<i>H. histrix</i>	VU	unknown
55	Corals and sea anemones (Anthozoa spp.)	<i>Pavona decussata</i>	VU	2014
		<i>Porites ru</i>	LC	2014
		<i>Diploastrea heliopora</i>	NT	2014
		<i>Herpolitha limax</i>	LC	2014
		<i>Ctenactis echinata</i>	LC	2014
		<i>Polyphyllia talpina</i>	LC	2014
57	Mangrove horseshoe crab (<i>Carcinoscorpius rotundicauda</i>)		DD	2014

⁵ CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC Least Concern; DD, Data Deficient (IUCN, 2012).

From the species included in Anukrat 123 and reliably recorded within the study area, one species, the hawksbill turtle (*Eretmochelys imbricata*) is critically endangered (Mortimer & Donnelly, 2008), two species, the humphead wrasse (*Cheilinus undulates*) and the green turtle (*Chelonia mydas*), which have been reported to use Koh Rong's sandy beaches as nesting ground (Tana, 1997; Try et al., 2002; Mulligan & Longhurst, 2014), are globally endangered (Seminoff, 2004) and at least ten further species are classified as vulnerable, mostly seahorses (*Hyppocampus* spp.) (see Table 6) (Mulligan & Longhurst, 2014). The three species occurring within the study area listed as critically endangered and endangered on the IUCN Red List are shown in Figure 24.



Figure 24: Critically endangered and Endangered species occurring within the study area: (1) *Eretmochelys imbricata* (credit: Marine Megafauna Foundation/photo by unknown), (2) *Cheilinus undulates* (credit: RAFY.pl/photo by Krzyzak, P.) and (3) *Chelonia mydas* (credit: Lindgren, P./photo by Lindgren, P).

Apart from the listed species in Table 6, Mulligan and Longhurst (2014) suggest that more globally significant Red Listed species within the class Anthozoa occur in the study area that are included in Anukrat 123.

Not included in the Anukrat 123 but listed in the IUCN Red List with the status of being globally near threatened are a number of shark species traded and reportedly sighted and caught within the study area, such as bamboo sharks (*Chiloscyllium* spp.), cat sharks (*Atelomycterus* spp.) and blacktip reef sharks (*Carcharhinus melanopterus*) (Mulligan & Longhurst, 2014; pers. obs., KRA/Sihanoukville, 2015). The brown-banded bamboo shark (*Chiloscyllium punctatum*) was the most frequently traded shark on local markets, which was recorded by the researcher (pers. obs., Sihanoukville, 2015). Furthermore, one shark species, listed as globally Vulnerable, the zebra shark (*Stegostoma fasciatum*), was reported to the researcher and identified using a survey guide by a group of local villagers to have been recently spotted close to the northern shore of Koh Rong Sanloem in December 2015 (local villagers, Mai Pai Bay, pers. comm., 2015).

6.1.2 Human Environment

The following chapter is an assessment of the study area's human environment, i.e. its demography, socio-economic aspects, infrastructure as well as land and resource use.

Demography

As already mentioned in chapter 3, a small population of unknown size inhabited the archipelago in the years before 1975. During the Khmer Rouge regime, the islands were evacuated. Repopulation with former inhabitants and new settlers begun in 1979 with the fall of the Khmer Rouge regime (Respondent D).

Today, the population of Koh Rong amounts to an estimated number of 1717 inhabitants, distributed to 400 households living in four villages situated along the coast, while the interior of the island is unpopulated (Mulligan & Longhurst, 2014). The four villages are Koh Touch, located in the south, Daem Thkov, located in south-east, Prek Svay, the largest village, in the north-east, and Sok San in the west, as mapped in Figure 25.

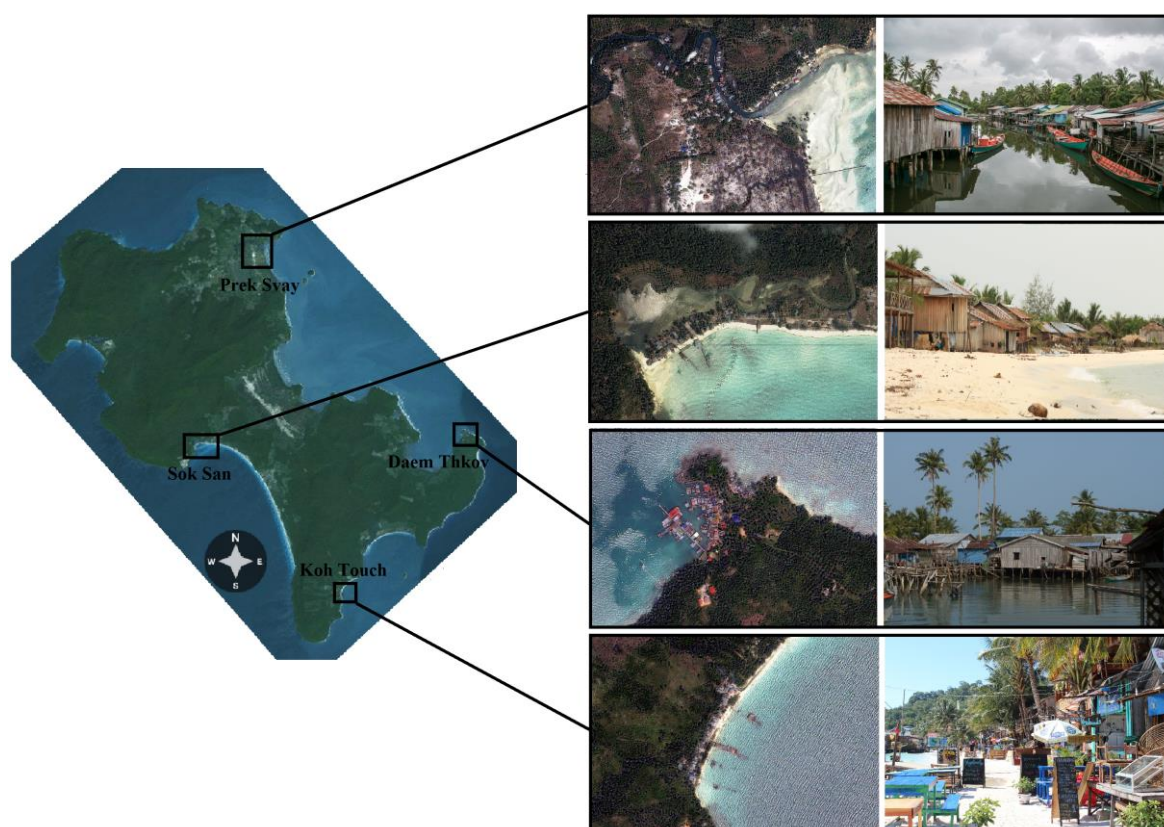


Figure 25: Location of Koh Rong's villages⁶

⁶ Map and aerial view of Koh Rong (credit: flasherarth.com/map by ArcGIS, Esri, DeLorme, FAO, NASA, USGS, Earthstar Geographics/Permalink:

All villages, except Sok San, are officially registered within Sihanoukville province's Mittakpheap district in Commune 5 (Mulligan & Longhurst, 2014). Table 7 shows how the population is distributed between the four villages, according to Mulligan and Longhurst (2014).

Table 7: Distribution of Koh Rong's population between the villages (Mulligan & Longhurst, 2014, p.63)

	KohTouch*	Daem Thkov*	Prek Svay*	Sok San**	Total
Housholds	81	89	148	82	400
Women	177	209	319		
Men	162	188	359		
Total	339	397	678	303	1717

* (Vibol et al., 2011b)

** (Diamond et al., 2012)

Since 2008, the population size of the archipelago seems to be relatively stable (Mulligan & Longhurst, 2014). According to Mulligan and Longhurst (2014), emigration to other provinces is occurring due to the decline in fish catches but growing opportunities in the tourism sector has led to outbalancing immigration numbers, especially in the fast developing and growing tourist destination Koh Touch.

The most spoken language on Koh Rong unsurprisingly is Khmer, with a few exceptions of Vietnamese and Thai (Mulligan & Longhurst, 2014). The majority of inhabitants are Buddhists (Mulligan & Longhurst, 2014). Literacy and basic education are relatively high amongst the villages of Daem Thkov, Prek Svay and Sok San with about 70% of the population having finished an average of four to five years of primary education, without great gender differences (Mulligan & Longhurst, 2014). The percentage of illiterate population with little or no education is with 50% significantly higher in Koh Touch (Mulligan & Longhurst, 2014).

In general, the population of Koh Rong is young, especially in Daem Thkov, where 45% of inhabitants are under 18 years old and another 50% between 19 and 50 years old (Mulligan & Longhurst, 2014). Similar percentages are seen for Koh Touch while Prek Svay seems to

<http://www.flashearth.com/?lat=10.70697&lon=103.255267&z=12.7&r=0&src=arc>); Photo Prek Svay (credit: Intrepid Escape/photo by Scott T.); Photo Sok San (credit: Panoramio/photo by ilraf); Photo Daem Thkov(credit: Panoramio/photo by Rohlaender, S.); Photo Koh Touch (credit: Stephanie /photo by Stephanie)

have a higher age profile with 60% of inhabitants being older than 30 years old (Mulligan & Longhurst, 2014).

Depending on weather and seasonality, the majority of inhabitants pursue multiple livelihood strategies with fishing for squids and crabs being the primary income source, followed by small-scale crop cultivation, other agricultural activities and a growing number of tourism-related activities (Mulligan & Longhurst, 2014; Respondent D). Respondent D believed that agriculture was more prevalent in Prek Svay than in the other villages, with the cultivation of cashew and coconut trees, vegetables, rain fed rice and upland crop farming. Respondents based on Koh Rong reported that tourism in the area has gained a great importance, especially for Koh Touch, as this is the main point of arrival for boats and ferries from Sihanoukville (Respondent A; Respondent C; Respondent D). Here a major shift of income source occurred in recent years (Mulligan & Longhurst, 2014). According to Mulligan and Longhurst (2014), surveys conducted in 2011 with villagers of Koh Touch showed that 90% of inhabitants were mainly involved in fishing-related activities for their income, whereas surveys conducted in 2013 found not one remaining fisher. 70% stated that they had changed their income source completely from fishing-related activities to tourism services. Declining fish stocks combined with higher income gained through tourism related jobs were the main reasons for this change of income sources reported to the researcher within informal interviews conducted with inhabitants of Koh Rong. Hereby especially young inhabitants of Koh Rong expressed to be interested in occupation within the tourism sector rather than within traditional activities such as fishing and agriculture.

Infrastructure

An interviewed local villager (Respondent D) reported to the researcher that infrastructure on Koh Rong is relatively undeveloped, with electricity being available through diesel generators and boats being the most important means of transportation for people and goods. Forest trails connect the villages but lead through rough terrain that makes the transportation of goods very difficult (Respondent D). Furthermore, the trails are often overgrown by vegetation and in the rainy season periodically impassable (Respondent D). The only significant road construction was built by the Royal Group and started in early 2010 (Respondent A; Respondent B). The unpaved road connects Koh Touch and Daem Thkov in the southern part and extends further along the east coast. Since 2012 the island has had access to the internet through an underwater fibre-glass cable to Sihanoukville as well as to

the mobile phone network thanks to the installation of telecommunication antennas in 2011, also financed by the Royal Group (Vibol et al., 2011a; Respondent B).

A number of ferries operate between Sihanoukville and Koh Rong, with Koh Touch being the main point of arrival. Depending on the choice of vessel, the crossing takes between 30 minutes to five hours. Koh Rong Dive Center is the main ferry operator with three different-sized speed ferries and carrying capacities of up to 100 tourists, running two to three times a day. Additionally, the Koh Rong Dive Center runs a number of supply boats, bringing goods and building materials to the island on a daily basis. The same boats are used to bring all sorts of waste from Koh Rong back to the mainland (Respondent G).

Water used on the islands comes from mountain streams and wells (Respondent D). An interviewed associate to a local business on Koh Rong (Respondent F) reported that guesthouses as well as residential houses in most cases have large water tanks to store water, which become especially important in the dry season. However, multiple respondents reported to the researcher that all villages experience annual water shortfalls with negative health effects for the population (Respondent A; Respondent C; Respondent D; Respondent E). According to the interviewed associates to local NGOs, the problem of water scarcity is expected to increase with the growing number of visitors on Koh Rong (Respondent A; Respondent C).

Wastewater treatment systems are non-existent (Respondent A). Residential homes and businesses either collected wastewater in cesspits or directly dump it into the sea or forests (Respondent A; Respondent D)

Tourism

In recent years, the island has increasingly become an attractive and important tourist destination for Cambodians as well as for international visitors, boosted by the fast growing tourism industry in the 20 km distant coastal city Sihanoukville (Muyhong, 2015; Respondent A). One of the main triggers for increasing tourist numbers on Koh Rong, or more specifically in the village Koh Touch, was the introduction of the first larger speed ferry in October 2013 by the Koh Rong Dive Center, carrying up to 100 tourists, and running two times a day and reducing the crossing time from over four hours to 30 minutes, while charging a relatively small price of USD 10 (Xiang, 2013a). Further smaller speed ferries were introduced in 2014 and 2015. Estimations by the Provincial Tourism Department suggest that in 2015 around 150,000 tourists may visit the Koh Rong Archipelago (Hasting

et al., 2015), while in 2011 there were only 36,000 tourists (Mulligan & Longhurst, 2014). After collecting anecdotal information, Hasting et al. (2015) suggested that 80% of the whole tourist population visiting the archipelago were backpackers, while 15% belonged to the mid-range class and 5% were luxury and high-end tourists, usually staying at the Song Saa Private Island Resort located on two small islets on the north-eastern coast of Koh Rong. In line with a WTP-survey of 1010 tourists conducted in 2014/15, Hasting and his team (2015) found that the tourist population of the archipelago consists generally of young foreign adults, travelling on a low budget with 85% under the age of 35 and 95% coming from countries besides Cambodia. Marine activities such as diving, snorkelling, swimming, recreational fishing, boating and relaxation on the beach are the most frequent activities carried out by tourists, followed by other nature-related undertakings such as hiking and jungle walks (Skopal & Ferber, 2010).

With the growing tourism industry, a significant number of foreign-run guesthouses and bungalow resorts have been settled on the island, mainly in Koh Touch (Respondent A; Respondent C). Respondent A and C reported to the researcher that this recent settlement of businesses in Koh Touch is happening for the most part in an uncoordinated and precipitous manner, due to the reason that land prices are increasing from year to year and businesses are rushing to the island in order to profit from its still pristine character. The exact number of tourism related businesses is not known, but according to anecdotal information collected from local business owners, there are about 50 guest houses, 10 diving operators and one luxury resort (Hasting et al., 2015).

Land Concession

In line with the government's efforts to promote coastal development and to attract FDIs through the resort and real estate industry, the Royal Government granted in 2008 a 99-year concession over the island of Koh Rong to the Royal Group, one of Cambodia's largest and most successful investment and development companies. The Royal Group's masterplan includes multiple resorts, casinos, marinas, golf courses and an airport and has been partially commenced with the construction of a road, the clearing of forest, the instalment of different telecommunication antennas and the connection to the internet by an underwater fibreglass cable, all laying the foundation for future development (Millennium Group, 2009; Royal Group, 2010; Respondent B). Figure 26 and Figure 27 illustrate some of the already

commenced infrastructure development. Further details of the masterplan will be discussed in chapter 6.3.



Figure 26: (1) & (3) Road construction work in 2012 (credit: The Royal Group/photo by unknown), (2) Arial view of 2012 road construction on the south-eastern part of Koh Rong, close to Daem Thkov (credit: The Royal Group/photo by unknown)

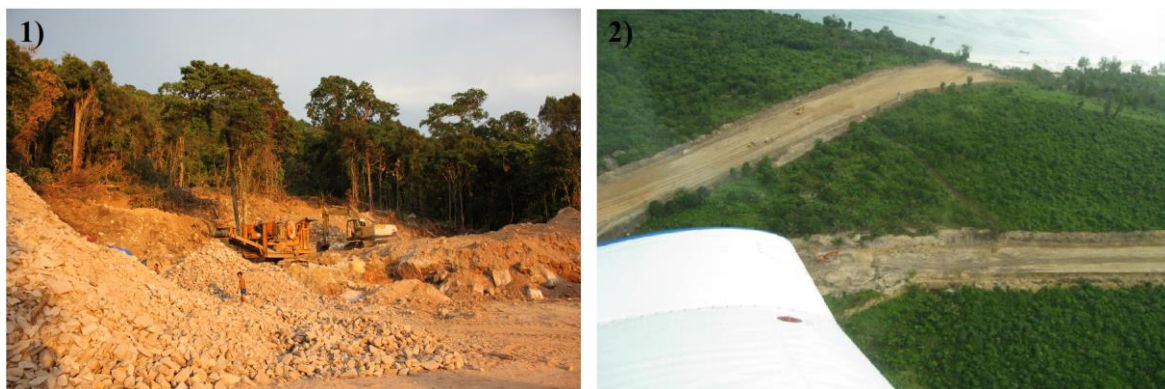


Figure 27: (1) Forest clearing in preparation for site development (credits: anonymous/photo by anonymous), (2) Initial clearing of runway (credit: The Royal Group/photo by unknown)

According to the interviewed informant associated to CBRE Cambodia (Respondent B), the Royal Group's partner company in charge of the commercialisation of the concession and the acquisition of investors, the realisation of the masterplan was announced to begin in 2009 but has been delayed due to slower than expected infrastructure development in Sihanoukville, or, more precisely, due to a lack of incoming international flights. With the announcement of opening of an international bridge through Sihanoukville in order to boost the country's coastal tourism and development in 2011 (Reuy, 2011), a number of companies have leased vast stretches of coastline. Yet, with the delay in the airport extension, Respondent B stated that the tourism-related infrastructure was also bottled up. However, the Sihanoukville airport is currently undergoing major upgrades which are expected to be completed by the end of 2015, allowing the arrival of international flights from Thailand,

China, Vietnam and other Asian countries, directly boosting coastal tourism (Laurenson, 2015a), letting concessioners once more be ready to start with the realisation of their masterplans (Respondent B).

Land Disputes

The land rights and landownership situation in the study area is a controversial subject involving all parties, namely local villagers, foreign businesses and the concessioner.

For example, it was not possible for the researcher to find out the exact legal area and size of the villages. Different maps showing areas of varying sizes allocated to the communities were presented by different informants, but always with the request of not using these maps for the purpose of this study due to their doubts of the map's validity.

According to numerous respondents, locals on Koh Rong in most cases do not hold secure land rights in form of hard land titles⁷ to ensure their ownership to the land they inhabit or cultivate, even though in some cases they have done so for over 20 years (Respondent A; Respondent C; Respondent D; Respondent E; Respondent G). The case seems similar for most foreign tourism-related businesses, especially along the southern coast, as, according to Respondent B, C and G, many of these businesses do not hold proper licences to operate on Koh Rong but rather have agreements with local authorities and are tolerated by the concessioner for the time being. Respondents reported that this situation results in discouragement of newly established businesses to invest in costly infrastructure such as renewable energy sources or sewage treatment systems (Respondent A; Respondent F). Enhancing this trend even more are reports of already affected foreign-owned businesses that have been shut down, their owners evicted and their premises demolished (Laurenson, 2015b).

The informant associated with CBRE Cambodia confirmed that the concessioner claims having land rights over the whole island with the exception of community land of around 197 hectares and some areas around Koh Touch that might be owned by local Oknhas⁸ (Respondent B).

⁷ A hard land title in Cambodia is the strongest form of property ownership certificate provided by the Land Management and Planning office, containing information that has been recognised and certified at a national level with the Ministry of Land and a cadastral office (realestate.com.kh, 2015).

⁸ Oknha is a honourable Cambodian title for an especially rich and successful businessperson (Verver & Dahles, 2014; Respondent B, CBRE, pers. comm. 2015)

These very nebulous landownership conditions unsurprisingly lead to inevitable occasional conflicts between the concessioner, business owners and locals. The most recent cases reported by media sources have been the stoppage by local authorities of the construction of dozens of apparently unlicensed bungalows belonging to local Oknhas in June 2015 (Channyda, 2015). Another recent case that made it in the national headlines was that of local villagers of Koh Touch, blocking excavators and bulldozers used by the concessioner to build a road through their village in July 2015 (Figure 28.1) (Sokha, 2015) and accusations by villagers that the Royal Group's bulldozer destroyed vital farming sites and crops in August 2015, affecting over a hundred families (Figure 28.2) (Laurenson, 2015b).

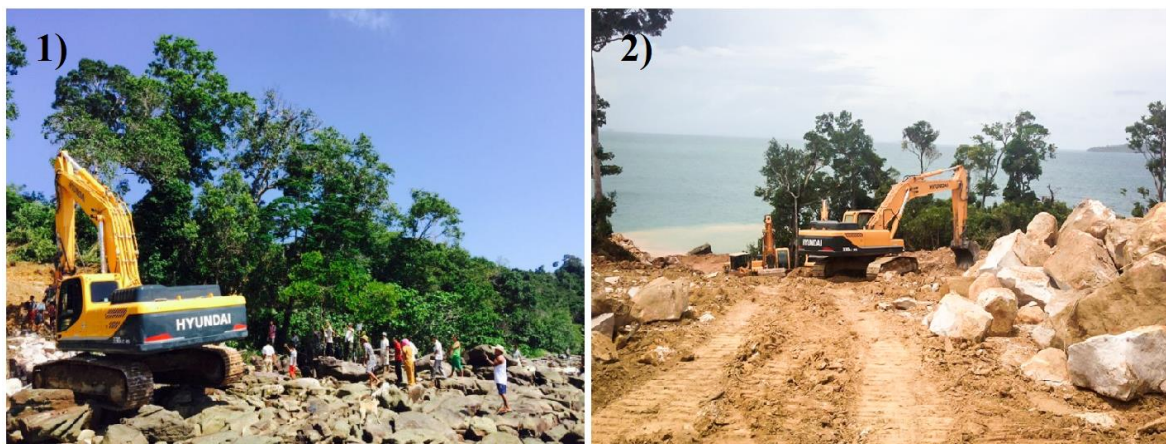


Figure 28: (1) Villagers blocking construction work of a road in July 2015 (credit: Phnom Penh Post/photo by unknown), (2) Clearing of forest in August 2015, allegedly destroying farming sites and crops (credits: Khmer Times/photo by unknown)

The ongoing land disputes on Koh Rong are reflecting the general sensitive land rights and ownership situation in Cambodia, as discussed earlier in this study (chapter 2.2), which is characterised by uncertainty and opaqueness.

6.1.3 Management and Uses

The Koh Rong commune is a relatively new commune, officially established in 2000 (Touch, n.d.) as a new commune in the Meattapeap district of Sihanoukville municipality. Therefore it is managed by the Sihanoukville governor and the Navy authority (Touch, n.d.).

Promoting community-based natural resources management in the area, the Ministry of Agriculture, Forestry and Fisheries (MAFF) authorised the four registered fishing communities of the Koh Rong Archipelago to establish CFis (Vibol et al., 2011b; Mulligan & Longhurst, 2014). By authorizing the establishment of CFis, parts of the fisheries domain that are under the jurisdiction of the Ministry of Agriculture, Forestry and Fisheries (MAFF)

are allocated to communities living in or around the fisheries domain (Mulligan & Longhurst, 2014). A CFi is a cooperative arrangement between the Ministry of Agriculture, Forestry and Fisheries (MAFF) and one or more communities in which the community obtains its own status, internal regulations and management plan (Mulligan & Longhurst, 2014). According to the 2006 Law on Fisheries (Article 59), a CFi has the purpose to enable a community to participate in the sustainable management of resources in its own areas and to actively take part in protection, conservation, development and utilisation decisions of fishery resources (FiA, 2007b).

Three CFis have been established within the Koh Rong Archipelago. Figure 29 shows the area of each CFi.

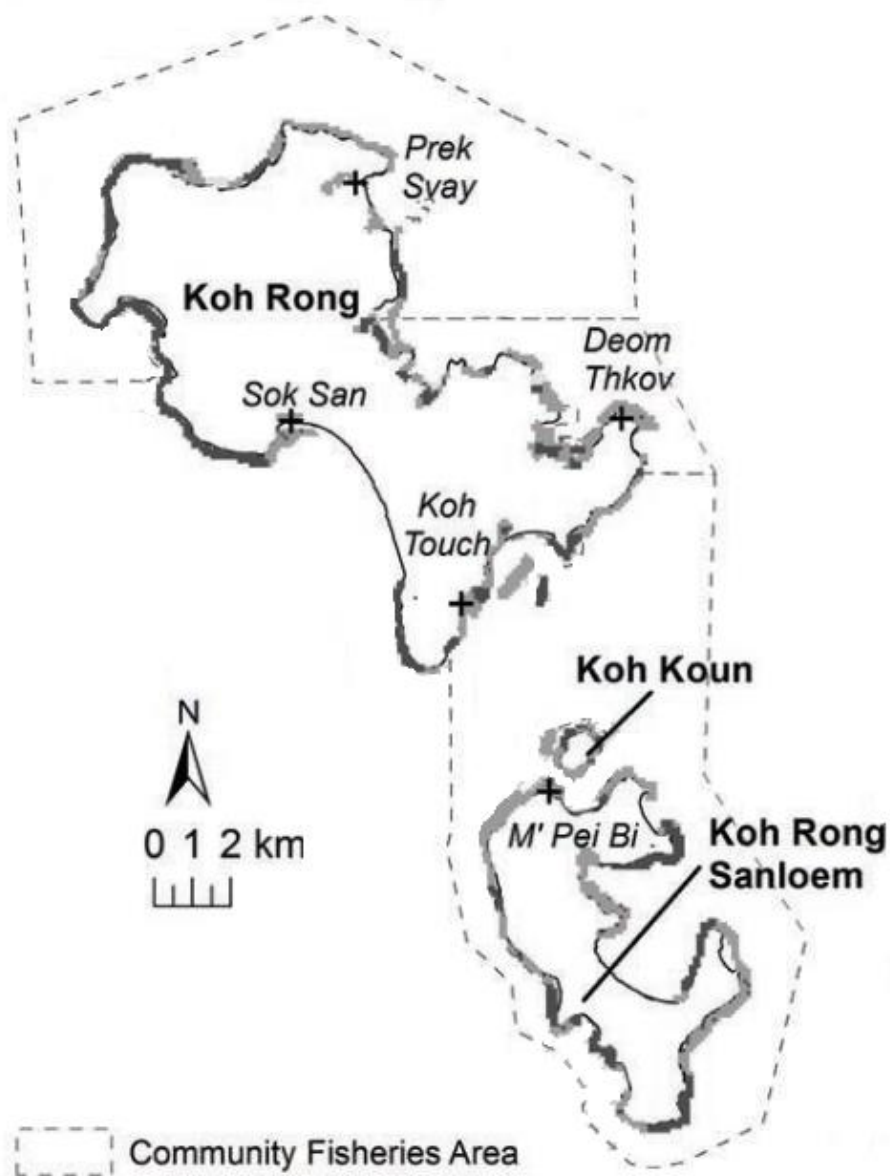


Figure 29: CFis of the Koh Rong Archipelago (Boon et al., 2014, p.60, modified)

The Prek Svay CFi comprises the water around the northern part of Koh Rong. The Koh Rong Sanloem CFi is managed by two villages, namely Koh Touch and M’Pei Bei, and extends over the waters around Koh Rong Sanloem and the waters in between both main islands as well as along the south and south-eastern coast of Koh Rong. The Daem Thkov CFi is the smallest and lies between the Prek Svay and the Koh Rong Sanloem CFis on the east coast of Koh Rong. Altogether, the three CFis cover an area of 18,672 hectares, “including the majority of fringing coral reefs and mangrove, and all of the known seagrass beds within the archipelago” (Mulligan & Longhurst, 2014, p.70).

An elected Community Fisheries Management Committee manages each CFi (Yeang, 2014). The general structure of a Community Fisheries Management Committee is shown in Figure 30 by Yeang (2014).

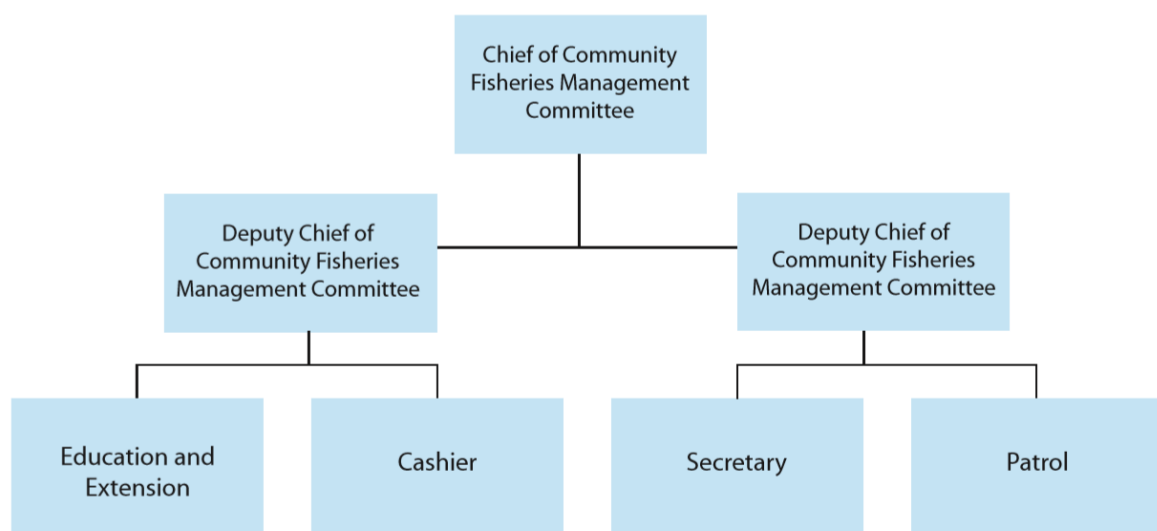


Figure 30: Structure of a Community Fisheries Management Committee (Yeang, 2014, p.70)

Detailed roles and responsibilities of each committee member within each individual CFi are further defined in the CFi internal rules/regulations (Yeang, 2014).

The CFis of the Koh Rong Archipelago have been supported and equipped with training and materials by multiple projects on behalf of private sector companies as well as from development organisations such as the Danish development assistance programme and the Food and Agriculture Organization of the United Nations’ Regional Fisheries Livelihood Programme (Mulligan & Longhurst, 2014). These efforts of building and strengthening the communities are not restricted to marine issues such as training in patrolling/boat handling,

the use of GPS and the installation of crab banks⁹, but also focus on other activities such as the training in fruit and vegetable farming, chicken rearing and family planning (Mulligan & Longhurst, 2014).

6.2 Conservation Plan Assessment

Besides the promotion of sustainable community-based natural resources management through the authorisation of CFis and the legal protection of mangrove forests, seagrass beds and coral reefs systems by Articles 28 and 52 of the 2006 Law on Fisheries (FiA, 2007a), the Cambodian government agreed to an additional number of environmental protection measures for the country's coastal and marine areas. By signing the Convention on Biological Diversity for example, different targets were set, including the conservation of at least 10% of the coastal and marine areas of particular importance for biodiversity and ecosystem services by 2020, through an effective and equitably managed, ecologically representative and well-connected system of protected areas and other effective area-based conservation measures (RGC, 2014). Another commitment to the protection of coastal and marine ecosystems was done with the implementation of the Strategic Planning Framework for Fisheries in 2010, which includes targets such as the protection of at least 7,000 hectares of seagrass, 840 hectares of coral reef and the rehabilitation of 1,000 hectares of mangrove forest by 2019 (MAFF, 2010). A third agreement on environmental protection that needs to be mentioned in this context is the National Action Plan for Coral Reef and Seagrass Management, that aims to put at least another 840 hectares of coral reefs and 9,000 hectares of seagrass under an appropriate form of sustainable management by 2016 (Vibol et al., 2012).

To meet these ambitious goals and targets that are set for the near future, the Fisheries Administration (FiA) of the Ministry of Agriculture, Forestry and Fisheries (MAFF) of the Royal Government of Cambodia is currently seeking for appropriate coastal and marine areas to put under protection (Boon et al., 2014). The area that until now has attracted the most attention for the purpose of protection is the Koh Rong Archipelago. Here, since 2012 the FiA has been working with a range of national stakeholders and international NGOs to

⁹ Crab bank operation in Cambodia is a community-based undertaking and has been used as a tool for stock enhancement by keeping gravid (carrying fertilised eggs) female crabs alive in cages until they release their larvae into the water, before being sold to markets (FAO-RFLP, n.d.)

create the country's first MPA, which in Cambodia is named MFMA, around the islands of Koh Rong and Koh Rong Sanloem (Boon et al., 2014), with the vision to create "[...] a model MFMA for conservation of marine biodiversity, sustainable fishing and tourism, contributing to poverty reduction" (Mulligan, & Longhurst, 2014, p 79).

To support strategic planning, governance and management of the implementation process, the Technical Working Group for the Koh Rong Archipelago MFMA (TWG-MFMA) was established, comprising of representatives of the different parties involved (Mulligan, & Longhurst, 2014).

The specific goals and objectives of the MFMA touch upon the archipelago's biophysics, socio-economy and governance (Mulligan & Longhurst, 2014). Biophysical goals and objectives include amongst others the restoration, maintenance and protection of ecosystem functions, the protection of ecological processes essential to habitat existence and the elimination or minimisation of unnatural threats and human impacts within the MFMA. Socio-economic goals and objectives include amongst others the maintenance of traditional family fishing practices, the improvement of the public's understanding of environmental and social "sustainability" and the food security, income and livelihoods benefits of the MFMA which are felt equally by all members of the community. Governance related goals and objectives include amongst others the enhancement of people's willingness to respect and comply with the zoning scheme, the enforcement of local and national laws and regulations and the strengthening of the communities' organisation and participation in the MFMA management. A complete list of all MFMA goals and objectives was provided to the researcher by a member of the TWG-MFMA and is available with Appendix A.

The design and zonation of the proposed MFMA has been under consultation since 2012 and is based on on-site community consultations, provincial and private sector consultations, national consultations through the Fisheries Administration (FiA) and the Ministry of Agriculture, Forestry and Fisheries (MAFF) as well as on the compilation and incorporation of biophysical data (Boon et al., 2014; Mulligan & Longhurst, 2014). Figure 31 shows the draft zone map of the Koh Rong Archipelago MFMA, presented in the research and recommendations report by Mulligan and Longhurst (2014).

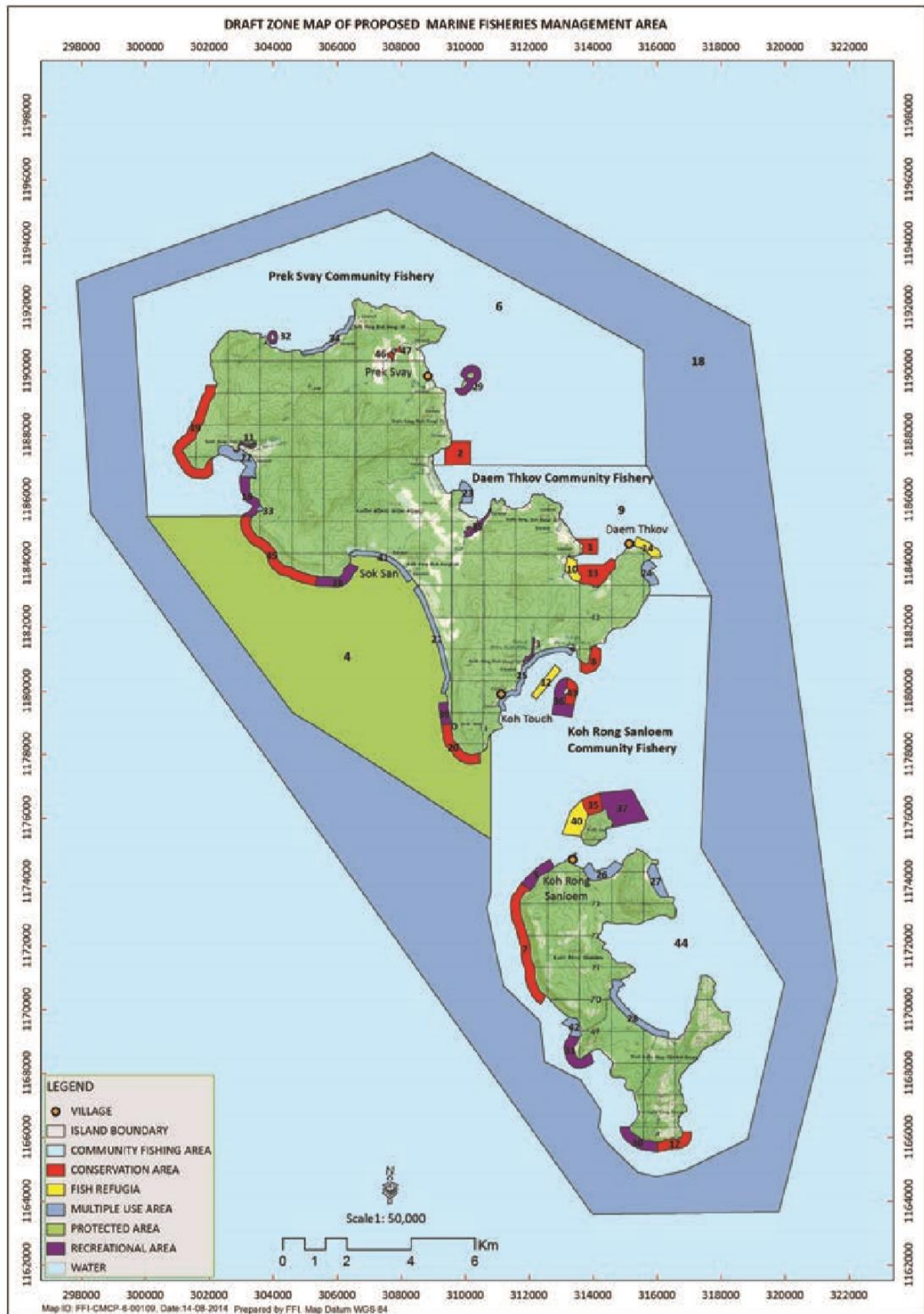


Figure 31: Proposed zoning map for the Koh Rong Archipelago MFMA (Mulligan. & Longhurst, 2014, p.84)

The proposed MFMA covers a total area of ocean of approximately 400 km² (Mulligan & Longhurst, 2014). As seen in Figure 31, the existing management structure of CFis, as discussed in chapter 6.1.3, is integrated in the MFMA design. This is expected to support the CFis through the improvement of their management effectiveness in order to encounter ongoing resource declines (Boon et al., 2014). Furthermore, the map illustrates a multiple-use zoning scheme of areas, assigned for different purposes. As stated by Mulligan and Longhurst (2014), these zones include

- *Community Fishing Areas*, as defined by the 2006 Law on Fisheries (FiA, 2007a); they are managed by the fishing communities and intended for subsistence fisheries,
- *Conservation Areas*, as defined by the 2006 Law on Fisheries (FiA, 2007a), in which any activity that has a negative effect on any fishery resources, or more precise on any marine organisms, living or non-living fauna and flora such as fish, mollusc, amphibian, insect, reptile, mammal and other invertebrate that get fertilised in water, planktons, seaweed, sea grass, coral reef, inundated forest including mangrove etc., is strictly prohibited except for permitted scientific research,
- *Fish Refugia*, a concept introduced by the Regional Working Group on Fisheries (RWG-F) and the Southeast Asian Fisheries Development Center (SEAFDEC) with the aim of sustaining important species during critical stages of their life cycle (Paterson et al., 2013), whose restrictions and potential temporary closure still needs to be defined,
- *Multiple Use Areas*, as defined in the guidelines for the establishment and management of coral reef ecosystems in the Kingdom of Cambodia, where coastal development is allowed, provided it does not destroy reefs,
- one *Protected Area* with the same restrictions as the *Community Fishing Areas* and
- *Recreational Areas*, which are proposed to function as no-take zones in which recreational activities such as diving are allowed.

The draft zone map of the MFMA was consigned to the Ministry of Agriculture, Forestry and Fisheries (MAFF) for further consideration. According to information obtained in early 2015 through interviews with different members of the TWG-MFMA, the draft-zoning map reportedly needed only one last approving signature to enable its implementation, which would be the signature of the prime minister himself, an act to happen at any time soon (Respondent C; Respondent H; Respondent I).

6.3 Development Plan Assessment

The Royal Group, led by one of Cambodia's most influential businesspersons Neak Oknha¹⁰ Kith Meng, president of the Chamber of Commerce and personal advisor to Prime Minister Hun Sen, is one of Cambodia's largest and most successful investment and development companies, holding a 99-year concession on the island of Koh Rong. The Royal Government granted the 7,893 hectares concession to the Royal Group in 2008, as part of a larger land reclassification campaign that occurred between 2008 and 2010 and involved other 27 islands off the Cambodian coast (ADHOC, 2013).

The masterplan presented within this study, as shown in Figure 32, is a version provided by the interviewed associate to CBRE Cambodia (Respondent B). CBRE Cambodia, which is the Cambodian branch of the world's largest commercial real estate services firm, had an advising role in designing the masterplan and at present is responsible for the commercialisation of the island, attracting investors and bringing venture partners to produce the vision of the Royal Group.

The masterplan at hand is not the final version, as the detailed, final version was not permitted to be handed out. However, the researcher was allowed to examine the final version of the masterplan on site while conducting the interviews. Except for minor changes of land use attributions, the character of the final version does not vary significantly from the one presented in this study, as noticed by the researcher and confirmed by Respondent B, who remarked that the major difference of both plans is an additional marina planned inside a bay located on the eastern coast, close to Daem Thkov. This being said, for the purpose of the preparative study in hand, the version presented here is sufficiently dimensioned.

¹⁰ Neak Oknha is a honourable Cambodian title for an especially rich and successful businessman who makes substantial financial contributions to national development projects (Verver & Dahles, 2014; Respondent B, CBRE, pers. comm. 2015)

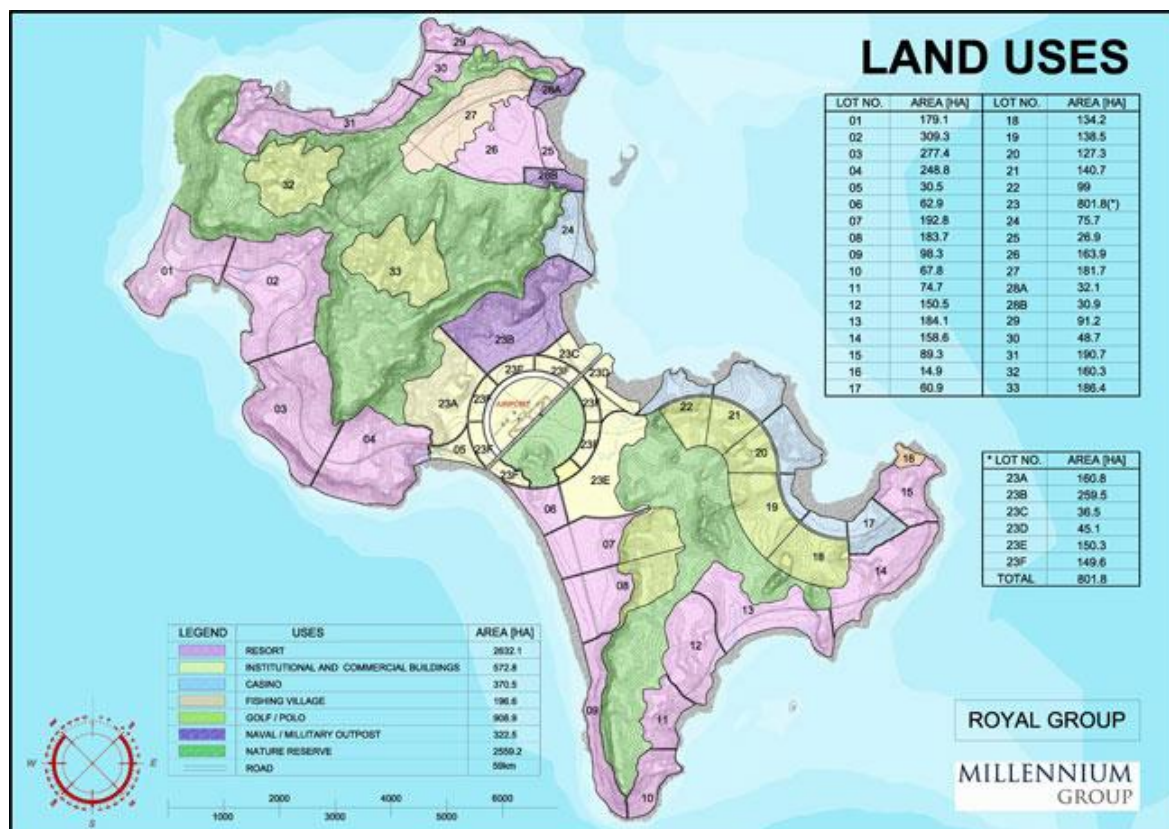


Figure 32: Masterplan of the Koh Rong Development (Respondent B, CBRE, Phnom Penh, 2015)

As can be seen in Figure 32, the masterplan includes 33 lots assigned for the development of multiple resorts, casinos, commercial buildings, marinas, golf courses, two fishing villages and one airport, amounting to an area of around 5,300 hectares. Around 2,550 hectares (~30%) of the island, mainly located around higher elevations, are classified as nature reserve and remain undeveloped. Respondent B reported that the masterplan has been partially commenced with the construction of a road, the clearing of forest, the instalment of different telecommunication antennas and the connection to the internet by an underwater fiberglass cable, all together laying the foundation for future development. From the already existing accommodations in Koh Rong, Respondent B pointed out that only one is linked to the Royal Group, which is a resort, located close to the village Sok San on the west coast. This resort was built in connection with the production of an international TV-series. Another resort, that according to two other respondents can be connected to the Royal Group is the first and only high-end luxury resort in the archipelago and was reportedly established with the assistance of the Royal Group's CEO Kith Meng (Schneider, 2015; Respondent C; Respondent D). According to Respondent B, most of the other bungalow resorts and guesthouses don't have permission to operate on Koh Rong but are accepted for now, as

long as they keep Koh Rong active on Internet portals with good reviews about the area, don't do any damage to the environment or affect the Royal Group's development plans.

As explained in chapter 6.1.2 of the baseline assessment, the development of Koh Rong was announced to start in 2009 but has been delayed due to slower than expected infrastructure development in Sihanoukville. However, this delayed development is currently catching up at fast pace, especially with the completion of the airport expansion announced for the end of 2015, which will substantially increase the number of incoming international flights. This expected increase in tourists is stimulating coastal development, by letting concessioners revive paused development schemes. Respondent B confirmed that the Royal Group has also planned to resume construction at the latest in 2016 with the realization of a first phase, including hotels and possibly some private residences to sell. "Especially for capital in China the development on Koh Rong seems to be a quite interesting option" (Respondent B), noticeable in a number of interested Chinese investors who currently are consulting with CBRE Cambodia to evaluate their opportunities. According to Respondent B, interest in the Koh Rong investment has never been greater than at present. The completion of the entire masterplan is expected take around 25 years (Respondent B).

Respondent B explained to the researcher that the potential of Koh Rong lies in the current efforts of the government to promote the country's coastline as the new Indochinese Riviera, adding a major travel destination for national and international tourists to the temples of Angkor Wat and Phnom Penh. However, Respondent B continued, the main target group for the Koh Rong development are Asian tourists, especially the wealthy Chinese upper class. According to Respondent B, this is because the key to the attraction of Chinese tourists is gambling, as seen in the casinos of Phnom Penh, which have an exclusive status in the gambling mega world, while gambling is banned in China and Cambodia's neighbouring countries Thailand and Vietnam (Cohen, 2014). Therefore, Respondent B assured that "Koh Rong will have a gambling licence, facilitating multiple casinos located along the east coast". Respondent B also pointed out that in total four marinas are planned for the transportation of visitors, staff and goods, although only three are represented in the masterplan shown in this study (Figure 32). As mentioned earlier, a fourth marina is planned inside a bay located on the eastern coast, close to Daem Thkov. There will be no docking access along the west coast (Respondent B), thus all four marinas will be located along the east coast, as, presumed by the researcher, it is the more sheltered side of the island with lower currents, wind and wave action. The two smaller marinas located on the north eastern coast are expected to be

used for guest transportation and private boats, while an additional marina of 250.5 hectares, planned on the central east coast adjacent to the planned airport, intended for logistics and supplies (Respondent B). The fourth planned marina, is expected to be located within the sheltered bay close to Daem Thkov on the eastern coast, designed to accommodate “ships with a capacity of up to a few hundred people” (Respondent B). However, “the idea is to eventually have big cruise ships coming to the island” (Respondent B), while the size of cruise ships was not defined.

An additional means of transportation will be via airplane. Therefore, as it can be seen in Figure 32, a centrally located airport, with a roughly 7.200 m² airport terminal and a 2.650 metres runway are planned, accommodating airplanes with carrying capacities of up to 200 passengers such as the Airbus A321 (Xiang, 2013b).

According to Respondent B, the long-term goal is to bring international flights from all over Southeast Asia directly to Koh Rong, while in the short-term, it will already serve as a hop over to access the island from closer destinations like Siem Reap or Phnom Penh.

Respondent B reported that the Royal Group is planning to implement a two kilometre exclusion zone around Koh Rong to render the island more commercially viable, referring to an already installed fishing exclusion zone around a small resort island nearby the Koh Rong Archipelago that was put in place by the respective developer. Respondent B argued that “the exclusion zone would provide the concessioner and venture partners complete control of access to the island, giving them authority to stop boats from docking or to charge docking fees”. According to Respondent B and second hand information gained from Respondent C, this exclusion zone has been under negotiation with the central government at the time of the interviews.

In the opinion of Respondent B, the planned development is a great opportunity for the local population of Koh Rong, which was estimated by the Respondent to be in the few hundreds. Respondent B also noticed that not only the population inhabiting the island at present will benefit but also a significant number of additional inhabitants, brought to the island as employees for the tourism infrastructure. Respondent B reasoned that “the main benefit [for the population] is the potential employment opportunities in the initial construction phase and ultimately in the facilities such as hotel complexes, leisure facilities or transportation” and that “locals would benefit from better infrastructure such as roads, electricity, telecommunication and water supply”.

According to Respondent B, in theory there should not be any land-rights related issues with the local population due to the fact that the population is only recently established on the island. However, Respondent B also admitted the following:

[...] some locals might pop up with documents, that can cause legal issues as those have managed to register soft land titles¹¹ for certain parts of Koh Rong. They were issued by local authorities. These are not particularly secure, but might cause some transitional issues and holding ups of constructions (Respondent B).

However, Respondent B continued to argue that “ultimately, the central government issued the concession to the Royal Group and employment opportunities will be enough encouragement for people to not hold up constructions”. Marty Kaye, CEO of the Millennium Group, the Royal Group’s former partner in the Koh Rong project, used the following words when asked in 2008 by the Guardian reporters Levy and Scott-Clark about the land rights situation on the island:

[...] what most of them [villagers] don't understand is that even if they have papers, they are not worth anything. All of them are registered only locally, not in Phnom Penh, so they will have absolutely no case. Others are just squatters with no papers at all (cited in Levy & Scott-Clark, 2008).

Respondent B reported that an ESIA has been commissioned by the Royal Group in 2010. According to multiple respondents, the assessment, however, neither included the participation of the local communities nor has it made available for the public (Respondent C; Respondent D; Respondent G). Respondent B could not provide information about the conducted EIA such as by whom it was conducted or where could be found due to the fact that the respondent had never seen the assessment, despite the fact of being in charge of the consultation of potential investors. Respondent B, however, assured to track down the conducted ESIA in order to provide the assessment to the researcher. Due to unknown reasons this was never put in practice, even after repeated efforts of request from the researcher. According to multiple press releases from 2010 and the Royal Group’s website, the ESIA was conducted by the Malaysian branch of the U.K. based engineering consultant company Scott Wilson (CAAI News Media, 2010; Royal Group, 2010). Scott Wilson’s offices in Kuala Lumpur, however, had undergone reorganisations along with the company’s

¹¹ Soft titles are the most common form of ownership and the most common Cambodian land titles, provided by the local Sangkat or District office. Soft titles are not registered at a national level (realestate.com.kh, 2015).

take-over by the U.S. firm URS Corporation in 2010 (URS, 2015), the same year of the conducted ESIA, and a further take-over of URS Corporation by another U.S. firm in 2014, namely the AECOM Technology Corporation (AECOM, 2014). All efforts by the researcher of contacting the three mentioned companies as well as the Royal Group itself in order to track down the ESIA conducted in 2010 remained fruitless. In the opinion of Respondent B, “whatever the investors will deliver on Koh Rong, will be environmentally sensitive” and that “most development that is likely to take place on Koh Rong, most probably wants to be sealed as environmentally conscious”. Respondent B assured the researcher that “sustainability is a big priority for their [the investors] branding and corporate image”. It is not for nothing that the Royal Group is advertising the Koh Rong development as the “world's premier eco resort island planned from the ground up” with slogans such as “Paradise forever”, “Responsible luxury” and “Planned to preserve perfection” (Royal Group, 2010).

6.4 Perception Assessment

To increase the viability of estimated consequences related to the planned Koh Rong development, the researcher obtained perceptions, not only from the concessioner, as briefly discussed in the previous chapter, but also from other local stakeholders and interest groups towards the Royal Group's masterplan.

6.4.1 Local Authorities

The local government officials of the Sihanoukville municipality and the Koh Rong commune management, including the provincial governor, publicly expressed their endorsement of the Royal Group's masterplan (Channyda, 2015; Respondent C). The researcher also learned that authorities responsible for the implementation of the KRA-MFMA and therefore authorities with interests in the protection of coastal and marine habitats, as discussed in chapter 6.2, are likewise backing the terrestrial development planned by the Royal Group. Respondent H for example, an official involved in the organisation of the proposed MFMA, expressed during an interview conducted by the researcher, a strong support of the masterplan. This support is mainly based on the belief and trust in the advantages and benefits of the announced development, arguing that the tourism development planned by the Royal Group will bring a significant amount of financial means

to the area, which in turn will facilitate the protection of marine habitats and bring benefits to the archipelago in general. Respondent H used the following words to express the endorsement of the masterplan:

[...] [an employee of the Royal Group] showed me the plans. Everything they will do will be a benefit to the MFMA. They do good things. [...] They bring a lot of money (Respondent H).

Furthermore, Respondent H stressed that the local communities on Koh Rong will benefit from improved infrastructure.

6.4.2 Local Population

According to Respondent A and C, both associated to local NGOs, as well as Respondent D, an interviewed villager, the local population is aware of the Royal Group's masterplan, mostly by word of mouth communication. However, all three respondents also stated that details such as the expected beginning of construction work, its timeframe or the location of construction sites is not known due to the fact that the local population has until now neither been involved in nor consulted about the planned development, a situation that reflects the country's widespread secrecy surrounding land concessions and their development (Subedi, 2012). Interviews with representatives of different stakeholder groups (Respondent C; Respondent D; Respondent E; Respondent G) as well as personal communications with villagers of the Koh Rong communities showed that the local population is concerned about their future in regards to the Royal Group's development plans. Fear of forced evictions and relocations due to the unclear land rights situation, as well as negative impacts on their livelihoods due to deforestation, loss of agricultural land and habitat destruction were the main concerns reported to the researcher by Respondent D and Respondent E.

When the researcher asked Respondent D and E about the possible benefits of the Royal Group's development project for Koh Rong's population, job opportunities and improved infrastructure in the form of roads, electricity and waste management were mentioned the most. Job opportunities were expected to be especially high on construction sites (Respondent D). However, Respondent D and an associate to a local business (Respondent F) believed that once the constructions are completed, the local villager's chances to generate more income from the employment within the operational resorts and facilities will be little. This belief was based on the fact that the planned luxury resorts will presumably employ for the most part skilled and trained staff recruited from professional service schools in

Sihanoukville or Phnom Penh. Along with informal interviews conducted with local villagers, the example of the Song Saa Private Island Resort, located on a small islet just off Koh Rong's coast, was pointed out (local villager, Koh Rong, pers. comm., 2015). The Song Saa Resort has been the first high-end luxury resort within the study area, opened in 2011 and believed to be established with the assistance of the Royal Group's CEO Kith Meng (Schneider, 2015; Respondent C; Respondent D). The resort employs around 140 staff members, which are lodged in a staff village on Koh Rong. According to a former employee of the resort, only a small part of the staff actually comes from Koh Rong, while most come from service schools in Sihanoukville (former employee; Song Saa; pers. comm., 2015). Respondent D reported to the researcher that in some cases, villagers from Prek Svey had accepted financial compensation from the Royal Group in order to cede agricultural land:

The Royal Group is trying to buy something already. Some families sold land to them already if they have farmland. One hectare around USD 7000. Now they stop farming and only live in the village (Respondent D).

This was the case for Respondent E, who stated the following reason for having sold the farmland:

We sold [the land] only because they [the Royal Group] will take it anyways later. So at least we got some money for it (Respondent E).

The lack of consultation of the local population and the consequent unsupportive attitude towards the Royal Group's intentions is reflected in occasional conflicts between villagers and workers employed by the Royal Group to clear forest for construction, as mentioned in chapter 6.1.2 of the baseline assessment.

The researcher has learned that issues related to the Royal Group were sensitive matters and that the villagers often either did not like to discuss the topic or tended to get quickly agitated. Respondent D and C believed that all four of Koh Rong's communities would oppose any development by the Royal Group that threatened their villages, livelihoods or culture. Improvements to the island's infrastructure, such as roads, electricity and water treatment in connection with reasoned and transparent tourism development and related opportunities for income generation, however, were mentioned within numerous informal interviews conducted with local villagers, to be endorsed and supported by the archipelago's population (local villagers, Koh Rong, pers. comm., 2015).

6.4.3 Local Businesses

Interviews and personal communications with different owners of local businesses revealed that many businesses were aware of the Royal Group's concession, but similar to the local population's state of knowledge, did not have information about the masterplan's details, such as expected beginning of construction work, its timeframe or the location of construction sites. Respondent F, an associate to a local business operating in Koh Touch, stated that the majority of business owners on Koh Rong generally do not support the Royal Group's intentions but many see it as an inevitable development, pointing out the development of tourist destinations in the neighbouring countries. When the researcher asked about Respondent F's contract duration for operating the business on Koh Rong, the respondent answered the following:

We don't know for sure. One year is safe but we don't know what about in two or three years. Maybe nothing will happen and we are still here in ten years. We hear many different things from the businesses here around (Respondent F).

Respondent F reported that this situation of uncertainty was resulting in discouragement of newly established businesses to invest in costly infrastructure such as renewable energy sources or sewage treatment systems. Media reports of already evicted foreign-owned businesses were considered to enhance this trend even more (Laurenson, 2015b).

According to Respondent A and Respondent C, land used by small local businesses has often been rented from larger local businesses and affiliated local Oknhas, which were claiming the land for themselves, reflecting once again the country's unclear landownership situation. Respondent G reported to the researcher that the larger local well-established businesses strongly oppose the Royal Group by discrediting the masterplan, compromising its feasibility and emphasising their own strength and increased influence in the area. Respondent G used the following words to describe the situation:

[...] this people [the Royal Group], they don't even know the reality. They sit somewhere in Phnom Penh [...] but they don't know nothing. [...] They promised the government that in five years they will make roads, they will make schools, they will make this and that. All they did is a couple of roads. Nothing. [...] Your project needs to be realistic. [...] Look at the masterplan. I know, they say it's going to be the first environmentally sustainable resort island [...]. But they dream and they lie. [...] They would destroy everything [...] because they don't know and don't care. [...] It won't really happen the way they are thinking (Respondent G).

Respondent G reported that in order to raise their claim and bring on an opposition to the Royal Group, the larger local well-established businesses work together with local Oknhas to buy land on Koh Rong and rent this land out to various smaller businesses. An associate to a local investor who joined the interview conducted with Respondent G, made the following statement regarding the issue:

[...] we bought everything [sections of land along the coast of Koh Rong] and sell piece by piece to very big people. We bought the beach, the land, everything. [...] This is about politics. This is our strategy. [...] We sold some pieces to very big people. Very big, strong guys. And these guys protect their money. They will not lose their money. [...] Some [land] we keep for ourselves. If it is only ourselves, we cannot protect the land. But these people are very big. [...] Now we are big [...] and we got involved very big people in it. So there are many big people against this group [the Royal Group] now. [...] I think, The Royal Group is gone. Finished. In this island, they have no more power. They lost (associate to a local investor, Sihanoukville, pers. comm., 2015).

Furthermore, Respondent G confirmed that some businesses are putting an effort in organising the process of granting secure land titles for the local population of Koh Touch, the village where they are operating, and impeding the Royal Group's claim on the southern coast.

6.4.4 NGOs and Human Rights Organisations

The interviewed respondents associated to local NGO's reported that their state of knowledge regarding the planned development is likewise fragmented and imprecise, attesting the general state of disinformation found throughout the archipelago (Respondent A; Respondent C). However, Respondent C, who is associated to an environmental NGO, expressed concerns regarding the planned terrestrial development on Koh Rong. While stating that the current uncontrolled development on Koh Rong, mainly around Koh Touch, is already putting a great pressure on local coastal and marine habitats, especially due to insufficient waste and wastewater treatment, the planned land use changes are believed by both respondents to threaten terrestrial and marine ecosystems on a larger scale (Respondent A; Respondent C).

One respondent associated to a NGO also expressed concerns regarding the Royal Group's plans, while at the same time denouncing the current uncontrolled development in the study area, pointing out tourism-related problems such as pollution, overcrowding, drug abuse and cultural alienation (Respondent A).

Respondent J and Respondent K, both employed with nation-wide operating human rights organisations, did not know about the Royal Group's intentions on Koh Rong, except from vague rumours. When confronted with the masterplan, however, both respondents independently stated that they see a high potential for land rights issues, if the Royal Group would implement the masterplan.

6.5 Comparative Assessment

Contributing to the estimation's viability of potential consequences related to the development assessed within this study, the researcher has reviewed the consequences of a similar coastal development project with comparable character and features that are in the process of construction or have already been completed.

6.5.1 Dara Sakor Seashore Resort

Located along the Cambodian coastline at approximately 10 km distance to the north of Koh Rong, a luxury Chinese tourism project, the Dara Sakor Seashore Resort and a Chinese port construction are currently under development by the Tianjin Union Development Group. The real-estate company from northern China was granted a 36,000 hectares concession over 99 years by the Cambodian government in 2008 (ODC, 2015d), the same year that the concession over Koh Rong was granted to the Royal Group. Just like the planned Koh Rong development project, the Dara Sakor Seashore Resort is often publicly labelled as an eco-tourism project (David, 2014) and advertised by the company as “an effort to create a catalyst for economic improvements in the region, without compromising the area's natural assets or the traditional lifestyle of the local people” (Union Group, 2011a).

In 2011, an additional concession of 9,100 hectares was granted to the company on adjacent land, in order to develop a water reservoir and a power plant (ODC, 2015e; Santasombat, Y., 2015). On a larger scale, but similar to the Royal Group's masterplan for Koh Rong, the masterplan of the Union Group project comprises multiple luxury resorts and hotels, golf courses, casinos, marinas, yacht clubs, a deep sea port with railway connection, a four lane and 68 km long highway, artificial islands and an international airport (Union Group, 2011a; Harbinson, 2015; Respondent L). Just as planned on Koh Rong, extensive casinos and gambling facilities are under construction to attract the desired visitor target group from China (Harbinson, R., 2015), underlining this intention by publicly announcing on their

website that the “property will become a new tropical beach paradise for the rich Chinese” and a place for “extravagant feasting and revelry” (Union Group, 2011a). The difference between the two projects is, besides their scales, that the Union Group’s development is further ahead with already built resorts, golf courses, highways, while other infrastructure is being under construction, such as the airport (Pheap, 2015b), the deep sea port and railways (Union Group, 2011a).

Another similarity to the Koh Rong concession is that the Union Group’s concession is likewise located in an area, recognised as critical for the conservation and protection of the environment (Santasombat, 2015), due to its worldwide unique, rich and diverse wildlife (Royan et al., 2009). More precisely, the concession is located in the coastal area of Cambodia’s biggest national park, the Botum Sakor National Park, which has been protected under royal decree since 1993, aiming to develop opportunities for the local population and promote a sustainable future. Furthermore, the coastal waters of the Botum Sakor National Park are in close proximity to the planned KRA-MFMA and are themselves under consideration to become the country’s second large MPA with the aim of creating a network of MPAs across the northern part of coastal Cambodia (Savage et al., 2014; Respondent L). Besides the similarity of the project’s character as a luxury tourist development and the environmental conditions of the area, also the socio-economic situation of the affected local population within the concession resembles the situation on Koh Rong. The 12 villages located in the area were established before 1960s and evacuated during the Khmer Rouge regime (Santasombat, 2015), repopulated in the 1980s and officially recognised by the government in the 1990s (Santasombat, 2015); that formally makes them slightly older than the Koh Rong commune. According to a report by the UN’s Special Rapporteur on the situation of human rights in Cambodia, district officials involved in the assessment of the occupied land stated that the concession could affect 1.163 families inhabiting the area (Subedi, 2012), of which the majority’s livelihood depends on fishing and therefore to access to the sea (Santasombat, 2015). Within a newspaper article by Titthara & Boyle (2014b), it is stated that the Union Development Group invested USD 10 million in the relocation and compensations of the affected communities.

As with any large-scale project, a publicly accessible ESIA including the participation of affected communities was required by law. However, according to the UN’s Special Rapporteur, the reportedly undertaken EIAs and SIAs did not consider any community consultation, nor has it been available for public review (Subedi, 2012). The non-

involvement/consultation of affected communities soon has led to a number of serious human rights issues. After numerous unsuccessful protests and complaints against the project, in October 2011, about 1000 families of the 12 communities had accepted compensations and left their villages to move into one 4,000 hectares relocation site located several kilometres inland (Subedi, 2012), where, according to the Phnom Penh Post authors Titthara & Boyle (2014a), the Union Development Group had placed hundreds of identical kit homes in a mountainous area, next to a newly finished four-lane highway. Subedi (2012) writes in his report that some villagers stated to have accepted the relocation under pressure or threat through the presence of armed forces, lack of information or lack of alternatives while some other families rejected the compensations at all and remained in their villages. Additional newspaper articles covering the issue reported that by the end of 2013, a large number of villagers had abandoned the relocation site and returned to their former villages (Seangly, 2014). According to Subedi (2012), many stated that the land and the compensation given to them did not correspond with the negotiated terms, while various newspapers reported about a lack of basic infrastructure such as electricity, water supply, toilets and adequate housing on allocated land plots that were smaller than agreed combined with a scarcity of options for income generation through unfertile land and the distance to the sea that made the site uninhabitable (Narim, 2014; Reaksmey, 2014; Seangly, 2014).

A wave of forced evictions within the concession area hit the headlines of multiple national newspapers once again in 2014, when military forces and armed security guards working for the Union Development Group reportedly attacked villages with stones, axes and knives, threatened villagers with assault rifles and burned down their houses and farmland (Reaksmey, 2014; Titthara, 2014; Vida, 2014). Some hundreds of families still refuse to leave the area and have resisted eviction so far, hoping that eventually, the Union Development Group cuts the areas out of their project site and let them stay (Reaksmey, 2015). During meetings in mid-2015, villagers met for the first time with both the company and government officials after several years-long land disputes. However, the meetings were fruitless and the issue far from being solved (Reaksmey, 2015).

Apart from these unsolved social issues resulting from the development, several negative environmental impacts related to the concession are reported to have occurred within the protected area of the Botum Sakor National Park. Extensive clear-cutting of protected forests within the concession area is readily identifiable on Landsat satellite images published by Hansen et al. (2015). Especially mangroves seem to have been degraded to such an extent,

that they are almost non-existent throughout the park (Hansen, 2015). Habitat fragmentation, mainly caused by the completed highway, is believed to negatively affect arboreal species populations such as the endangered pileated gibbon (*Hylobates pileatus*) (Royan, 2010). Of great environmental and social concern is also the construction of the deep-sea port, as it is being built within a Community Fishery area, which is locally managed by the Koh Sdach fishing community. The effects on marine habitats have not yet been studied, but Respondent L, who was involved in the organisation of the Koh Sdach CFI, informed the researcher that the construction has a severe negative impact, especially on coral reefs in the area.

7 Prediction of Potential Impacts

Background researches on the topic, combined with particular researches done within and about the study area, allowed the researcher to give fair estimations about potential consequences of the planned development. However, it is important to keep in mind that these are entirely estimations with the purpose of delivering the basis for further in-depth studies on specific issues in order to obtain greater certainty.

7.1.1 Environmental Impacts

The environment of the study area consists of multiple diverse ecosystems, which can be distinguished from each other due to their significant differences in properties. While to a casual observer the different ecosystems may appear like separate realms, the wellbeing of every single one is dependent on multiple factors influenced by other ecosystems, as they are bonded together in unexpectedly powerful ways (Zimmer, 2012). Complex chains of interactions connect the constituents of the different ecosystems, both directly and indirectly as well as vertically and horizontally, through trophic, informational and abiotic linkages (McCauley et al., 2012). McCauley et al. (2012) hypothesise that these ecological chains of interaction between different sub-systems might be especially long and rich in linkages within isolated environments, such as island ecosystems.

The higher the complexity of these interaction chains and the higher the number of links between the different sub-systems, the more fragile and vulnerable these are to disturbances, as alteration or elimination of any of the links in an ecological interaction chain can negatively affect and destabilise wider ecosystems and their functions (Wootton, 1994; Tylianakis et al., 2004; Bascompte, 2009). The planned terrestrial development on Koh Rong will unavoidably have an influence on many of the occurring ecosystems by different means such as habitat conversions, pollution and potentially the introduction of alien species. Land cover and land use change, however, is the influencing factor that was considered by the researcher in the first place due to the reason that it is the basis for the entire planned development. Its impacts therefore do not depend on the site-specific design of infrastructure, which for the most part was neither available to the researcher, nor needed for the purpose of a preparative research.

According to the Royal Group's masterplan, around 5,300 hectares (70%) of Koh Rong's surface area are assigned for development and therefore expected to gradually undergo some

kind of land-cover and land-use changes over the course of the project's expected life, meaning until 2035.

In the following section, potential consequences of land-cover and land-use changes in the prevailing ecosystems as well as inseparable issues of the island's hydrology will be discussed. The researcher chose to address potential impacts by examining the different sub-systems one by one. However, the interconnectedness between the different systems, as explained earlier on, will become clear to the reader.

Land-Cover and Land-Use Change

Evergreen broadleaved forests

Most of the surface area targeted for development will undergo a conversion of evergreen broadleaved forest, as this is, with 5,522 hectares the most commonly occurring vegetation type.

Loss of evergreen broadleaved forest cover could lead to significant change in the island's hydrology, or more precise, to a decrease in quality and quantity of available water resources. Dense forest cover has an important ecological function as watershed, by facilitating the generation of groundwater through the retention of precipitation, enabling groundwater infiltration and preventing rainwater runoffs (Lele, 2009). With an increase of sealed and impervious soil surface, through infrastructure and treeless areas, such as golf courses, water runoffs would increase during peak water discharges following rainfall events but decrease during dry seasons, when water is needed the most (Watson et al., 2000). Given that, according to Respondent A, C and D, water resources on the island are already scarce, leading to annual shortfalls with negative health effects for the population a further decline in the water supply would be a serious threat.

Another problematic result of evergreen forest loss is that soils of cleared forest areas will be exposed to wind and direct sunlight. Consequently, these soils dry out and therefore are easily eroded, especially during high precipitation events, as cohesive root systems, extensive litter, stems and trunks are missing to prevent the soil from being washed away (Watson et al., 2000). Progressing deforestation will intensify and spatially extend the discharge of these sediment-carrying overland flows into the sea, enhancing near-shore siltation, nutrient concentrations and water turbidity with negative impacts on coral reefs and seagrass beds through sediment deposition (ISRS, 2004). Sediment intrusion rates into the marine ecosystems are especially high during site clearings and construction phases, as

recently teared up soils and sediments lie loose and exposed at the surface. Figure 33 shows such recently cleared patches with high potential of sediment runoff into the sea along the south-western coast of Koh Rong.



Figure 33: (1), (2) & (3) Recently cleared construction sites with high potential of sediment runoff into the sea along the south-western coast of Koh Rong (photo by local villager)

A considerable effect of deforestation is, furthermore, the disruption of the forest's nutrient cycle. Soils of tropical forests are nutrient-deficient as most nutrients are stored in biomass that is overlying the soil's surface, such as litter. A loss of forest would result in fewer available nutrients within the environment of the island, as remaining nutrients in the soils would quickly be washed out or carried away, along with eroded material (Vitousek, n.d.). This could have an effect on the fertility of adjacent agricultural land, cultivated by villagers. Lastly, the loss and fragmentation of vast areas of evergreen broadleaved forest would likely result in the further decline in species diversity, as the evergreen forest is the largest terrestrial ecosystem on the island and is inhabited by most occurring species. Affected species would be, amongst others the Sunda pangolin (*Manis javanica*), which is listed as critically endangered on the IUCN Red List (Challender et al., 2014) and reportedly already almost extinct from the archipelago (local villager, Koh Rong, pers. comm., 2015), as well as the king cobra (*Ophiophagus Hannah*), which is listed as vulnerable (Stuart et al., 2012). Both species are highly dependent on dense forest habitats (Stuart et al., 2012; Challender et al., 2014).

As mentioned earlier, most of the surface area targeted for development will affect evergreen broadleaved forest, as this is the most commonly occurring vegetation type. However, its prevalence, especially on elevations and central parts of the island, are the reason for evergreen broadleaved forest being almost the only vegetation type remaining preserved within the 2,550 hectares (~30%) of the island that are classified as nature reserve, although the 2,550 hectares will be fragmented in two patches of similar size. One, larger patch on the northern part of the island with around three kilometres of coastline, and another one, smaller patch in the southern part, without access to the sea. Other vegetation types, with a

lower distribution range, are likely to be gradually superseded until their complete disappearance, as explained in the next section.

Melaleuca forests

Melaleuca forests, whose distribution is entirely limited to the central plain of the island, will be significantly affected directly, due to site clearing for the planned airport, surrounding commercial buildings and the adjacent marina for logistics and supplies. A small patch of melaleuca trees might remain in between the airport and the commercial buildings, assuming that the trees would not be damaged during the construction phase. However, even if a patch of melaleuca forest will remain intact, it will be isolated from surrounding vegetation types and therefore it is unlikely to survive on its own, due to the fact that melaleuca forests are often standing in close relation to mangrove forests and vice versa (Saenger, 2002). Furthermore, the low-lying area, with high levels of soil moisture, swamps and occasional seawater penetrations (Mulligan, & Longhurst, 2014), will presumably be drained prior to the infrastructure development, which probably will adversely affect the extent of the naturally occurring melaleuca forest (Brophy et al., 2013). The species composition of melaleuca forest on Koh Rong has not yet been studied (Mulligan, & Longhurst, 2014). However, Mulligan and Longhurst (2014) mention the occurrence of *Melaleuca leucadendra*, which according to Brophy et al. (2013), belongs to the tallest species of melaleucas, with heights between 10 and 20 metres and in some cases of over 40 metres, as measured in northern Queensland, Australia. The trees' height therefore could also lead to the intentional removal of remaining trees due to their proximity to the planned airfield.

With the loss of melaleuca forest, an entire vegetation type could disappear from the archipelago, as such a forest is almost non-existent on Koh Rong Sanloem and other neighbouring islands. The loss of melaleuca forest means the loss of habitat for a wide range of insects, birds and animal species (NSW, 2011), with further consequences for other forests and vegetation types occurring within the area. The nectar-rich flowers of melaleucas for example are a food source of high importance for flying foxes and fruit bats (Hall & Richards, 2000), which in turn are of extraordinary ecological and economic importance, due to their essential role as forest pollinators and seed dispersers (Fujita et al., 1991).

Clearing and draining areas of melaleuca forest, as well as other coastal and sub-coastal tree swamps, can also lead to a severe soil acidification and consequent problems of aluminium toxicity in case the soil type of the cleared area includes acidic sulfate soils (Joyce, 2005;

Bobbink et al., 2007; Safford et al., 2009). Acidic sulfate soils are a common and naturally occurring soil type in tropical areas of high soil moisture (Dear et al., 2002), such as the swamps inhabited by mangroves and melaleuca associations on Koh Rong. Estuarine bacteria within these organic substrates, commonly called marine mud or mangrove mud, turn sulfates under anaerobic conditions into iron sulfides, mostly pyrite (Joyce, 2005). Once exposed to air through forest clearing, dredging or draining, the iron sulfides react with oxygen and form sulfuric acid, which can lower the soil's pH-value down to two, causing significant environmental and economic impacts, such as the poisoning of aquatic species and even the degradation of concrete and steel structures (Joyce, 2005; Campbell, 2009). A low pH-level furthermore increases the solubility of heavy metals, resulting in a release of metal cations such as aluminium, lead, copper and cadmium into the water (Kemker, 2013). The occurrence of two larger creeks in the area and the occasional penetration of seawater during high tides facilitate the infiltration of potential acidic and toxic sediments into adjacent marine habitats (Russell, 2011).

Two respondents reported to the researcher that parts of the melaleuca and mangrove assemblage, in the area of the planned marina, have already been affected and degraded through the recent construction of a road, which presumably has led to a change in the local hydrology (Respondent D; Respondents I; Mulligan, & Longhurst, 2014).

Orchards and plantations

Agricultural lands, such as orchards and plantations, on Koh Rong are cultivated by the local population as part of their multiple livelihood strategies. The total area of agricultural land in the study area amounts to about 1,215 hectares (Mulligan, & Longhurst, 2014) and for the most part is composed of cashew and coconut trees as well as vegetable, rain fed rice and upland crop farming (Respondent D). Most of these agriculturally-used areas will be gradually claimed for infrastructure development, except for some remaining orchards in the north-east and southern tip of Koh Rong. Being less biodiverse than other vegetation types found on Koh Rong, the direct environmental impact of the conversion of orchards and plantations will be lower than that of naturally occurring vegetation types. However, the decrease of existing agricultural area will have major consequences for the local population, as agriculture is an important source of income. This, in turn, might force villagers to seek for new areas to clear and convert to agricultural land, which in the end inevitably will lead

to a further loss of evergreen broadleaved forest within the areas designated as nature reserves, with consequences as explained earlier on.

Grasslands and shrublands

Grasslands and shrublands occur in low-lying and coastal areas of Koh Rong and amount to around 402 hectares, which almost all will gradually be affected by infrastructure development, except a small patch located at the centre of the island. However, a loss of forested areas in line with site clearings for development purposes is likely to result in newly emerging grasslands and shrublands within and between patches assigned for development, as well as along forest edges (Cavalier et al., 1999; Dawson, 2012).

Hydrology

A change in land-cover and land-use can have altering effects on an area's hydrology, with numerous adverse effects, especially on small islands (Falkland, 1991; Falkland, 2002), such as Koh Rong. Respondent A, C, D and E reported that the island's freshwater resources are already becoming scarce on an annual basis and are expected to further decline in quantity and quality due to the future development's effects on the island's hydrology.

As mentioned earlier, the removal of dense forest and other vegetation types is likely to reduce the reaccumulation of groundwater by increasing precipitation runoff, especially when land cover is converted from vegetation to sealed and impervious surfaces and infrastructure (Lele, 2009). Apart from groundwater resources that are likely to be affected by land cover changes, also surface waters such as the several streams and creeks, are likely to be affected by altering surface runoff mechanisms related to the conversion of forests and other vegetation types. Stream flows might increase significantly during precipitation events while carrying high amounts of eroded sediment (Watson et al., 2000). During dry periods without or little precipitation, especially between January and May, flow rates of major streams might experience a significant further decrease, resulting in changed or dried-out streambeds. Less stream flow within creeks might also lead to saltwater intrusion and higher salinity levels.

The mentioned potential consequences of altered hydrological properties could have numerous negative effects on the environment. Species composition of the islands vegetation, especially along creeks, would be likely to change, with loss of mangroves due to higher salinity levels and sediment deposition, leading to additional saltwater intrusions and loss of fresh groundwater storages. Faunal species depending directly on these

freshwater habitats, such as the endemic Kohchang frog (*Limnonectes kohchangae*) or the Asian leaf turtle (*Cyclemys atripons*), would be at risk.

High sediment yields of surface runoffs and streams related to precipitation on cleared catchments are other major problems for water supplies on the island, by rendering them non-potable for days after heavy rainfall (Falkland, 1991; Falkland, 2002).

Furthermore, high turbidity and sediment loads caused by land use changes have often adverse impacts on near marine habitats (ISRS, 2014).

Mangrove forests

Presumably, all estimated 112 hectares of mangrove forest on Koh Rong will gradually be affected by infrastructure development, as they all lie within or along areas assigned for development. The largest continuous block of mangrove forest, which is located inside a bay on the eastern part of the island, will have to be cleared to make space for the planned marina, designed for logistics and supplies. An additional large block of mangroves within a sheltered bay close to Daem Thkov on the south-east of Koh Rong will have to be cleared for another marina, designed for the accommodation of tourist ferries. The remaining patches of mangroves that are located along the coastline are likely to be removed by the respective investor to create open beaches, along with resort development. Even if mangroves located along creeks might not be cleared, it is unlikely that these will remain intact. According to Respondent D and Respondent I, roadbuilding on Koh Rong has already led to the degradation of mangrove forest, presumably due to a change in the local hydrology (Mulligan, & Longhurst, 2014). Planned road building, along the creek that is running through the village of Prek Svay, is likely to affect the mangroves growing along its edges in a similar way. Another factor that, in the long term, is likely to affect remaining mangroves, especially those located along creeks, is the potential change of the island's hydrology, due to the loss of dense forest cover. As explained earlier, land cover change from forest to infrastructure or less dense vegetation types can have altering effects on the creeks' stream flow, salinity, sediment yield and other flow properties (Watson et al., 2000). Increasing salinity due to a decreased flow rate and resulting seawater intrusion, for example, would harm the present mangrove assemblage, leading to vegetation loss. Decreasing flow rate or the diversion of freshwater flows could furthermore lead to mangroves drying out. Increased erosion and the resulting increase of fluvial transported sediments can overcome the mangrove forest's filtering ability, leading to the forest being smothered (WWF, 2015).

A loss of mangroves within the study area would have multiple adverse environmental effects. An important ecosystem function that mangrove forests provide, for example, is their important role as natural coastal protection against erosion from wave action, especially during storms and rough seas (Othman, 1994). Without mangroves, erosion of streambanks and coastline is likely to set in, changing the courses of creeks and streams, as well as the geomorphology of the parts of the coast, where mangroves used to grow. Furthermore, saltwater is likely to reach further inland along cleared areas with an effect on freshwater reservoirs (Falkland, 2002). Apart from the negative effects on other terrestrial ecosystems, the loss of mangroves is just as threatening to close-by marine habitats, such as coral reefs and seagrass beds, as they significantly improve the coastal water quality by filtering, removing and cycling nutrients, pollutants and particulate matter before these can reach further seawards and affect the functions of marine ecosystems (Alongi, 2002).

Moreover, the loss of mangroves would eliminate an important foundation of the highly complex marine food web, as mangroves deliver the ingredients for the detrital food cycle, which provides nitrogen rich detritus material consumed by species of the lower trophic levels such as worms, snails, shrimp, molluscs, mussels, barnacles etc. (Odum, & Heald, 1975). A direct effect of mangrove loss on terrestrial and especially aquatic species that occur within the study area, including commercial fish and crustaceans as well as the critically endangered hawksbill turtle (*Eretmochelys imbricata*) (Gaos et al., 2012), would be the loss of habitat, nursery and feeding grounds (Alongi, 2002). An elimination of these critical habitats is likely to threaten the local abundance of fish and shellfish populations.

Beaches

The coastline of Koh Rong is equipped with around 28 beaches, amounting to a length of ca. 44 km. The clearing of mangrove forests is likely to increase the total length of sandy beaches. However, once the masterplan is realised, no beach will stay unaffected by the planned development, as all existing beaches will be claimed by resorts or converted into related infrastructure. In fact, the entire 71 km of coastline are situated within patches intended for development, except from an about three kilometres long rocky stretch located along the northern coast.

Increased human activity and related noise in areas of sandy beaches is very likely to negatively affect the occurrence of sea turtles within the archipelago due to the disruption of their breeding grounds. Green turtles (*Chelonia mydas*) for example have been reported to

use Koh Rong's sandy beaches as nesting ground (Tana, 1997; Try et al., 2002; Mulligan, & Longhurst, 2014). Another species reported to inhabit the archipelago is the hawksbill turtle (*Eretmochelys imbricate*). Both species are listed as globally endangered and critically endangered on the IUCN Red List (Seminoff, 2004; Mortimer & Donnelly, 2008) and furthermore listed in Anukrat 123, a sub-decree identifying nationally endangered aquatic organisms for increased legal protection (Mulligan, & Longhurst, 2014). Another species that depends on quiet sandy beaches as habitat and breeding ground and therefore is threatened by the loss of those, is the globally near threatened Malaysian plover (*Charadrius peronii*) (BirdLife International, 2012), a key-indicator species that has led to the creation of the Koh Rong Important Bird Area (Koh Rong IBA) in 2003.

Land – Sea Connection

As indicated in the introduction to this chapter and confirmed throughout the impact assessment of land-cover and land-use changes of the different sub-systems, the alteration or elimination of certain ecosystems might trigger a whole chain of reactions, affecting directly or indirectly multiple other ecosystems. These chain reactions do not stop at the transition from terrestrial ecosystems to marine ecosystems, as implied earlier by, amongst others, emphasising the importance of mangrove forests for the marine environment. Indirect influences from terrestrial land-cover and land-use changes as well as direct effects from coastal infrastructure on the most economically and ecologically important marine ecosystems, will be explained in the following.

Coral reefs

Presumably, all coral reefs around the island of Koh Rong will consecutively be affected by sedimentation and siltation related to the influx of eroded material exposed through loss of cohesive and protective vegetation such as the different types of forests occurring on the island. Sedimentation rates will be especially high during construction phases, as explained earlier. The only corals that might be less affected by sediment runoffs are those located along the north-western edge of Koh Rong, due to the fact that this coastal stretch of about three kilometres long will remain undeveloped.

Pollution and nutrient runoffs related to coastal infrastructure, once it is in place, are likely to further negatively affect coral reefs especially without the natural water filtering mechanisms of mangroves.

Direct degradation of coral reefs will presumably occur through the construction of the four marinas along the east coast of Koh Rong as those are planned in areas where reefs are occurring. Furthermore, dredging activities to create shipping lanes are likely to directly destroy additional reef systems and create further stress by stirring up sediments from the seabed, leading to siltation.

The loss of coral reefs has some direct effects on nearby habitats and ecosystems. Their natural function as buffer zone and wave breaker reduces coastal erosion and protects coastal infrastructure during storm events (Wilkinson, 2008). Therefore, degradation of coral reefs in the study area is likely to increase physical pressure on the coastline. Furthermore, coral reefs are highly biodiverse and of vital importance for all marine species occurring in the study area, as they are used as habitat, spawning and nursing grounds as well as refuge and feeding areas (Wilkinson, 2008). Several of the coral reef-dependent species occurring in the study area are under legal protection and internationally recognised to be critically endangered, as explained within the baseline assessment (chapter 6.1). A loss of coral reefs would be a direct threat to abundance and diversity of marine life with further effects on local fisheries.

Seagrass beds

Similar to coral reefs, seagrass beds in the archipelago are predominantly associated with fringing mangroves (Leng et al., 2014) and dependent on the sediment runoff-preventing functions of terrestrial forests. Deforestation is therefore likely to affect seagrass beds through siltation and eutrophication. Future pollution related to coastal infrastructure is expected to create additional pressure. The largest and most significant patch of seagrasses within the study area is located within a sheltered bay on the south-eastern coast of Koh Rong, close to the village Daem Thkov. This approximately 10 hectares seagrass bed lies in the same area as the planned marina, which is designed to accommodate visitor ferries up to the size of cruise ships. Inevitably, seagrass in the area will be destroyed by the construction and related dredging activities for the creation of a shipping channel. The degradation of the seagrass bed next to Daem Thkov village will, in the long run presumably lead to the total elimination of seagrasses from the island's coast, as the only other known seagrass bed located around Koh Rong was estimated to be as small as 20x20 metres and already threatened through pollution and siltation due to its proximity to Koh Touch (Leng et al., 2014).

Seagrass beds provide similar ecosystem services as coral reefs. They reduce wave energy and coastal currents and therefore function as natural coastal protection (Ondiviela et al., 2014). Furthermore, they stabilise the sea bottom sediments and therefore prevent siltation (Ondiviela et al., 2014). A loss of this natural and cohesive buffer zone is likely to increase wave action and siltation within the sheltered bay of Daem Thkov, with negative effects on adjacent ecosystems. In addition to the mentioned features of coastal protection and improvement of water quality, seagrass beds are highly biodiverse and a crucial habitat for a wide range of marine species occurring in the study area, including commercially viable fish and legally protected species such as green turtles (*Chelonia mydas*), seahorses (*Hippocampus* spp.) and dugongs (*Dugong dugon*) (Sereyath & Sokhannaro, 2003; Unsworth et al., 2007). A loss of seagrass habitats therefore would result in the loss of abundance and diversity of species within the Koh Rong Archipelago.

General Impacts of the Planned Development

Apart from environmental impacts related to land-cover and land-use change, a range of additional influencing factors that presumably will be caused by the future infrastructure and its operation are likely to affect the study area's ecosystems and their function. The issues that are the most probable to emerge will be discussed within the next sections.

Water consumption

The tourism industry is generally known to have a high demand for fresh water, required for the operation of hotels and related infrastructure such as swimming pools and golf courses, as well as to satisfy tourists with mostly higher water consumption patterns than the local population (Cole, 2012; Gössling et al., 2012). Often criticised for having an especially high impact on water resources is golf tourism (Thompson, n.d.). According to Cole (2012), who did research on the water demand of tourists in Bali, Indonesia, hotels associated with golf courses consume up to 1 million m³ of water per year. Another regional example of high water consumption by the operation of golf courses comes from Thailand, where according to Thompson (n.d.) an average golf course per year uses as much water as 60,000 villagers. The masterplan for Koh Rong includes two golf courses located on the northern part of the island, amounting to an area of about 350 hectares.

Additionally to the estimated decrease of the island's natural water recruiting ability due to land-cover change, the presumably high freshwater demand of future tourism-related infrastructure on Koh Rong is likely to severely stress or even exceed the island's water

resources capacity, mainly given the fact that water becomes scarce already during dry months. Furthermore, pumping for groundwater within a small island environment can potentially lead to saltwater intrusions into groundwater reservoirs, if pumping systems are operated excessively or if these are not designed for the specific hydrological properties (Falkland, 1991; Falkland, 2002).

An alteration of the island's hydrology would presumably affect most of the ecosystems within the study area in different ways, as explained earlier.

When asked about the possible issues related to the island's water scarcity, the interviewed informant associated to CBRE Cambodia (Respondent B) mentioned the potential installation of seawater desalination plants. This option had yet to be evaluated and was not included in the existing masterplan. In case desalination plants will be installed, some pressure could be relieved from naturally occurring water resources. However, several negative environmental impacts are associated with the operation of desalination plants, such as the local increase of seawater temperature, salinity, water currents and turbidity (Al-Mutaz, 1991; Roberts et al., 2010).

Waste outputs

The future infrastructure development and its operation will inevitably result in significantly higher amounts of solid waste, wastewater and sewage with the potential of negatively affecting the natural environment.

Increased precipitation runoff along with an increased area of sealed surfaces and loss of vegetation is likely to increase the influx of solid waste, chemicals and other polluting materials into the marine environment. Furthermore, the afore mentioned increase of water consumption will automatically lead to an increase of sewage and wastewater, which is likely to directly affect terrestrial and especially marine habitats, depending on where the sewage is pumped or treated. Davies and Cahill (2000) also noted leaching of nutrients from septic systems of tourism infrastructure as a significant polluting factor, "accelerating eutrophication of adjacent waterbodies and depleting dissolved oxygen supplies" (p.vi). Another source of significant pollutant and nutrient runoff that could trigger eutrophication are the two golf courses included in the masterplan. According to Thompson (n.d.), an average golf course in a tropical country of Southeast Asia needs 1500 kg of chemical fertilisers, pesticides and herbicides per year.

The extent of environmental impacts caused by solid waste, wastewater and sewage depends largely on the decision of the respective site developer of whether sewage treatment systems and waste management facilities will be installed and if so, how efficient these will be.

Noise pollution

Noise pollution in the study area will presumably increase significantly caused by airplanes, road traffic, resorts and casinos, boat traffic and recreational vehicles such as dirt bikes and jet skis. Numerous species within the study area will most likely be affected by noise pollution, causing distress, changes in their natural activity patterns (UNEP, n.d.). Especially threatened through noise pollution are noise-sensitive species inhabiting beaches, such as the Malaysian plover (*Charadrius peronii*), and marine turtles, which suffer both terrestrial noise pollution during nesting periods and marine noise pollution along, with boat traffic and other tourism-related activities.

Invasive species

The introduction of floral and faunal invasive species by human activity can have disrupting effects on an ecosystem. Isolated ecosystems such as islands are especially prone to dramatic changes caused by invasive species, which easily can result in the extinction of endemic species (CBD, 2015). A reason for that is, amongst others, the lack of natural competitors and predators as well as the availability of ecological niches that have not been occupied, all together increasing the probability of successful invasions (CBD, 2015).

Along with the tourism-related development on Koh Rong, visitor attractions such as artificial green spaces, gardens and presumably the occasional exhibition of living animals implies the high probability of such an introduction of non-native species to the island, with possible devastating effects on the ecosystems through the potential introduction of diseases into native populations, predation, competition, and habitat manipulation (Platenberg, 2007).

7.1.2 Social Impacts

The implementation of the Royal Group's planned large-scale tourism development on Koh Rong will presumably implicate a number of beneficial changes for the island's population such as the improvement of basic infrastructure including electricity supply, road systems and supply of goods as well as the possible opportunities for income generation and access to healthcare. However, it is likely that the realisation of the masterplan will also lead to a number of unwanted negative impacts that could result in conflicts between the different

stakeholders. The main potentially occurring negative impacts will be discussed in the following sections.

Local Population

Land disputes

As explained in chapter 6.2.1 of the baseline assessment, disputes over landownership between villagers, businesses and the Royal Group are already occurring on Koh Rong. For different reasons, the number and dimension of land disputes, however, is very likely to intensify along with the progressing implementation of the masterplan.

According to the Royal Group's masterplan, presented in chapter 6.3, about 197 hectares are assigned as fishing village and therefore reserved for the local population. These 197 hectares are split into two lots. Lot number 16 measuring 14.9 hectares is located in the area of Daem Thkov. The second lot, no. 27, measuring 181.7 hectares, is located roughly in the area of Prek Svay, which means that two out of the four villages are not represented on the masterplan. The area of both villages, Sok San on the western coast and Koh Touch on the southern coast, instead is assigned for resorts and commercial buildings. According to the masterplan, lots no. 04 and 05 will replace Sok San, while lot no. 11 will replace Koh Touch. In total, 642 villagers of 163 households would be displaced, with a need for alternative space and relocation sites. However, from the sighted masterplan it does not become clear where on Koh Rong the 642 people would be relocated. Estimations about the size of Koh Rong's population, as reported to the researcher by the informant associated to CBRE Cambodia (Respondent B), were in the few hundreds instead of 1717 as estimated by Mulligan and Longhurst (2014). This either indicates an underestimation based on a lack of knowledge or can be interpreted as a purposeful repudiation of the villager's land rights. However, the researcher repeatedly was told during conducted interviews that eventually the Royal Group's plan is to reorganise and relocate all villages in the area of Prek Svay (Respondent C; Respondent D; Respondent G). This information was not confirmed by CBRE Cambodia's informant (Respondent B). However, some factors could indicate such plans. Firstly, lot no. 27, which on the masterplan is allocated as fishing village in the area of Prek Svay, is 181.7 hectares relatively larger compared to the 14.9 hectares allocated to Daem Thkov with lot no. 16 and the non-existing allocations for Sok San and Koh Touch. The larger lot size, therefore, might be chosen for the purpose of reorganising and relocating all four villages in one area. Secondly, the area around Prek Svay is less commercially viable

due to a lack of sandy beaches. Thirdly, Prek Svay is with 678 inhabitants, the largest village on Koh Rong. In case of relocation, Prek Svay's inhabitants would not have to be moved far away and therefore a relocation would be easier to manage. Furthermore and explained later on, the village of Prek Svay is to some extent already used as a showpiece village for guests of the Song Saa Private Island Resort, the country's first high-end luxury resort, which is located on a small islet just off the coast of Koh Rong (Schneider, 2015; Respondent C; Respondent D).

However, due to the local population's strong disfavour towards the Royal Group's intentions, compliance with relocation arrangements cannot be expected, a situation that in a Cambodian context easily ends with the forced evictions of villagers. Respondent C stated the following when asked by the researcher about the villager's opinion on eventually happening relocations:

The main clashes, they [the Royal Group] will have with the people. This will be even more difficult for them to tackle than the environmental problem. [...] People won't leave or move voluntarily (Respondent C).

Relocation site

Assuming that a successful relocation of all 1320 villagers from Sok San, Koh Touch and Prek Svay to lot no. 27 took place and the 397 inhabitants of Daem Thkov would be able to remain living in lot no. 16, further impacts on the population would be likely to emerge.

Villagers of Daem Thkov would lose important agricultural land as well as access to forest resources to nearby resort and casino constructions.

Within lot no. 27, the 678 inhabitants of the former nearby village Prek Svay would have to share the remaining arable land as well as the already scarce boat parking spaces with an additional number of 642 villagers from Sok San and Koh Touch, which would have lost vast areas of agricultural land to resort construction on lot no. 26 and boat parking spaces to privatised coastline.

The high population density in lot no.27 combined with a loss of agricultural land, access to forest resources and boat parking spaces will presumably generate tensions within the population. The situation for both lots allocated to villagers is likely to be further complicated by the decrease of fresh water resources through the high water demand of the tourism related infrastructure, and in the case of lot no. 26 especially through the two nearby-located golf courses, namely lots no. 32 and 33.

Livelihoods

With the loss of agricultural land, villagers would lose an important source of income and food within their multiple livelihood strategy. Fishing and tourism-related income would therefore automatically gain importance. However, marine resources are in decline and presumably will decline even more rapidly along with the environmental impacts on the marine habitats, as discussed in chapter 7.1.1. Employment in activities related to tourism development is therefore in the long term likely to become the main income source.

Job opportunities for the local population are likely to increase during the construction phase of the project, as villagers could work on the construction sites. However, due to lack of professional training, income opportunities for the local population within the operational phase of the tourism infrastructure would presumably be limited to low-income jobs, while higher positions would for the most part, be covered by skilled personal, trained in service schools on the mainland. As mentioned earlier, this trend is seen in the only already established luxury resort within the study area, the Song Saa Private Island Resort, where according to respondent D, most of the 140 staff members living on Koh Rong are recruited from service schools on the mainland.

Another emerging issue could be the job level friction, due to the fact that Respondent E reported that the income disparity between nationalities at the Song Saa Resort is already causing discontent amongst some employees and villagers. The statement of Respondent E was confirmed to the researcher in an informal interview conducted with a former employee of the Song Saa Resort (former employee, Song Saa, pers. comm., 2015).

The extent of potential benefits for the local population in terms of improved livelihoods and sources of income will mainly depend on the Royal Group's efforts to have villagers involved in the project. However, the widespread disinformation and non-existing communication between the local population and the Royal Group, as well as the strong underestimation of Koh Rong's population size by CBRE Cambodia's informant (Respondent B) suggest that involvement of the local population is not a priority.

Commercialisation of local culture

A reason for the expected minimal offer of livelihood improvement was believed by Respondent A to be the Royal Group's potential intention of commercialising local culture characterised by artisanal activities, and using the planned fishing village in lot no. 27 as a tourist attraction. That the commercialisation of local culture is not uncommon is shown by

the very similar development project of the Dara Sakor Seashore Resort, presented in chapter 6.5. On the project's website, a fishing village is advertised as a tourist attraction along with other entertainment facilities such as a 54-hole golf course, a large water entertainment center, a jungle spa club (Union Group, 2011b). Within the study area, the commercialising of local culture is already practiced by the Song Saa Private Island Resort. Guests of the luxurious five-star resort are offered "added experiences" to their visit, including a beach picnic, scuba diving and speedboat tours (Song Saa, 2015b). Along with these entertaining resort activities, an island safari is offered featuring a village-walk through Prek Svey in order to see how villagers live and participate in monk blessings and other arranged cultural and religious ceremonies (Song Saa, 2015b). Jason Brighton, a Senior Travel Consultant from Ackerfeld & Goldberg Travel Associates, promotes the village-walk through Prek Svey with the following comment in an interview with Travel Associates:

"I urge guests to visit the local village and school to see the local way of life. It [...] reminds you, just how lucky we are in Australia. The Song Saa staff will take you through the village and transport you back, all of which is complimentary" (Brighton, 2015).

A local villager noted within an informal interview that such an experience for the resort guest could not be possible if the villagers of Prek Svey would have the means to modernise their daily life (villager, Koh Rong, pers. comm., 2015).

The Song Saa Resort puts a lot of effort in its reputation of altruistically helping the community of Prek Svey to become more resilient by promoting itself with the initiation of programs such as a floating education centre named "boat of hope", a sericulture showpiece-project and paid village clean-ups to clean the village from solid waste (Song Saa, 2013; former employee, Song Saa, pers. comm., 2015). However, these projects seem for the most part being put in place without much agreement between the resort management and the community (Governor, 2013); This gives the collaboration between both parties a strong top-down character (pers. obs.). Two informants furthermore confirmed within informal interviews that the Song Saa Resort has declared a ban on gambling and alcohol consumption in public, to improve the resort guests' experience of the Prek Svey village-walk (former employee, Song Saa, pers. comm., 2015; villager, Koh Rong, pers. comm., 2015).

With the expected relocation of local villages in an area where local culture is already used as a tourist attraction by a luxury resort, that reportedly has been established with the involvement of the Royal Group's CEO (Schneider, 2015; Respondent C; Respondent D), a

future imposed increase of the local culture's commercialisation along with the planned development is likely to occur. Such commercialisation of local culture often results in an artificially reconstructed ethnicity, a term used in the anthropology of tourism for the condition of a local population, whose culture has been turned into commodities by the reduction of religious traditions, local customs and festivities to a stage where their main purpose is to conform to tourist expectations (Grünewald, 2006).

Economic inequality

Along with the planned transformation of Koh Rong into a luxury resort destination, the economic inequality between tourist population and the local population is likely to become even more distinct than it is already prior to development. The lowest price for a regular stay at Song Saa Private Island Resort, the only already established luxury resort within the study area, amounts to USD 1.440 per night during low season (Song Saa, 2015c). The salary of a service-school trained Cambodian staff member averages around USD 150 per month (former employee, Song Saa, pers. comm., 2015). In other words, a resort guest, staying during low season in the cheapest available lodging, spends in one week as much money as a Cambodian staff member earns in five and a half years. The difference in income is even greater between local villagers and resort guests. Villagers are aware of this great disparity (local villagers, Koh Rong, pers. comm., 2015).

The planned tourism development aims to specifically attract wealthy guests by promoting Koh Rong as a luxury resort destination. Increasing visitor numbers inevitably results in increasing exposure of the local population to the tourists' holiday-lifestyle and consumer-behaviour. Along with a pronounced contrast of the luxury tourist facilities to the basic village infrastructure, social and sometimes ethnic tensions could be provoked (Ashley et al., 2007). According to the Royal Group's masterplan, both lots assigned as fishing village will face such a contrast between luxurious tourist facilities and basic village life. Lot no. 16 will be surrounded by land assigned for resorts and lies at the entrance to the planned cruise ship-harbours marina. Lot no. 27 is less surrounded by resorts but lies in close proximity to the two planned golf courses.

Loss of public access

For the local population, one beneficial effect of the planned development is the improvement of the road infrastructure, which will enable villagers to use a reliable road system instead of being dependent on boat rides around the island. However, along with the

development, about 65% of the island will be privatised, not including the 30% space assigned as nature reserve. Therefore, apart from the community land that will be claimed by development, the local population will most likely lose access to spaces which prior to development, were of great importance. Especially the loss of access to agricultural land and forest resources would have a strong restricting effect on the villager's livelihood strategies. Another problem could emerge due to privatisation of the coastline, of which around 95% will be claimed, mostly by resorts. The four existing villages on Koh Rong are fishing villages and most of the population, therefore, is accustomed to go to the sea, using their own long tail boats. Assuming that three of the four villages, namely Koh Touch, Sok San and Prek Svey, would be relocated in lot no. 27, as the masterplan suggests, the access to the sea of the 1320 villagers would be limited to the north bank of a small creek. Even though the village of Prek Svey, with its 678 inhabitants (Mulligan & Longhurst, 2014), is located at the mouth of the mentioned creek, boat parking space is becoming already scarce for the reason that boat owners used to park their boats between the small islets of their coast, especially during storms in the months of November and January (Governor, 2013; villager, Koh Rong, pers. comm., 2015). Since the small islets, however, are claimed by the Song Saa Private Island Resort, local fishing boats have to keep a 200 metres distance to the site. This 200 metres exclusion zone was implemented for reasons of marine conservation and supposedly with the hidden agenda to guarantee the resort guests' privacy, an assumption that becomes confirmed by the following statement that a member of the resort's own Conservation and Community Program once reported to an interviewer, when asked about the boat parking issue:

[...] the problem is the boat parking would need to be quite near to the islands. [...] it [the resort] is supposed to be quite a lot about personal space and intimacy. So if you have a lot of boats parked around the island of just random people then it is intruding quite a lot [...] (cited in Governor, 2013, p.106).

Consequently, with implementation of the 200 metres exclusion zone around the Song Saa Resort, boat owners lost access to the protecting natural harbour. In case of a relocation further inland, boat owners from Prek Svey instead would have to share the north bank of the creek with boat owners from Koh Touch and Sok San, which most likely would lead to conflicts amongst villagers.

While referring to the Song Saa Resort's model of marine exclusion zone, Respondent B reported in an interview that the Royal Group is likewise planning to implement such an exclusion zone, however, with two kilometres around the whole island of Koh Rong, significantly larger than the Song Saa Resort's one. What consequences such an exclusion zone would have for the local fishers did not result from the interview, as the exclusion zone with all its details at that time were still under negotiation with the central government (Respondent B).

Another loss of access to public space comes along with the development of lot no. 26, which lies in the same area as the island's largest pagoda and the school of Prek Svey.

Local Businesses and NGOs

Only two of the approximately 50 - 60 local businesses located on Koh Rong (Hasting et al., 2015) can be linked to the Royal Group. The remaining, mostly foreign-run business were established in recent years along with improved boat transportation and growing tourist numbers, especially around the village of Koh Touch and along the southern coast. According to the Royal Group's masterplan and information provided by Respondent B, these businesses eventually will have to leave the island, as the coastline will gradually be claimed by resort construction. However, a number of local and in the meantime well established businesses are claiming the coast for themselves (Respondent C; Respondent G). Land has been rented out and even sold under unclear circumstances, often without the knowledge of the Royal Group (Respondent C).

News agencies reporting recent clashes between local businesses and authorities, including the provincial governor, regarding the stoppage of the construction of several allegedly unlicensed bungalows (Channyda, 2015; Laurenson, 2015b) indicate that conflicts between local businesses and the Royal Group about landownership will most likely only increase during implementation of the masterplan. According to Respondent F, an associate to a local business in Koh Touch, the unclear land rights situation discourages a number of smaller businesses from investing in more sophisticated infrastructure such as sewage treatment systems. As long as the landownership issues are not clarified, this trend will most likely continue and put additional pressure on the environment.

Apart from the mentioned businesses, the work of at least two NGOs, one environmentally- and one socially-focused, will be affected by the planned development. The socially-focused NGO has been based for two years in Koh Touch and involves community capacity

development and education (project manager, NGO, Koh Rong, pers. comm., 2015) but, according to the masterplan, eventually will be forced to leave the area. The environmentally-focused NGO is located in Daem Thkov and is, therefore, less affected by eviction, as lot no. 16 is assigned to the village. However, the main project of the NGO is the deployment of artificial reefs structures close to the village with the aim of surveying sequence of species settling amongst the structures. At the time of conducting the research, about 177 reef components had been deployed within a period of 27 months (manager, NGO, Koh Rong, pers. comm., 2015). Environmental impacts from the planned development are likely to affect the continuation of the project, especially impacts related to the planned marina located next to Daem Thkov, as the artificial reef structures will most probably have to be removed due to dredging activities.

7.1.3 Impacts on Existing Management Structures

Community Fisheries

The three CFis located in the study area and presented in chapter 6.1.3 of the baseline assessment, were authorised by the Ministry of Agriculture, Forestry and Fisheries (MAFF) in order to promote community-based natural resources management (Vibol et al., 2011b; Mulligan & Longhurst, 2014). As stated in the 2006 Law on Fisheries (Article 59), the purpose of this community-based natural resources management program is to enable the respective community to participate in the sustainable management of resources in its own areas and to actively take part in protection, conservation, development and utilisation decisions of fishery resources (FiA, 2007b). Furthermore, Article 10 of the sub-decree on CFi management stipulates, amongst others, that a CFi organisation has the responsibility of establishing fish conservation areas and restore the habitats and ecosystems in their respective area (Blomley et al., 2010).

Considering the numerous potential negative environmental impacts of the planned development on marine habitats, it will presumably be difficult for the Koh Rong Archipelago's CFis to meet their responsibility of restoring and sustainably managing these. According to Article 10 of the sub-decree on CFi management, for example, the Daem Thkov CFi is, amongst others, responsible for the restoration of the archipelago's largest known seagrass bed and mangrove forest, both located within the sheltered bay on the east coast and both very likely to perish along with the construction of a large marina in the same area. The Prek Svey CFi, on the other hand, would be managed by the assemblage of

relocated villagers of lot no. 26, who lost proper access to the sea due to the land inwards location of the site. Furthermore, it is not possible for Koh Rong's CFIs to participate in the sustainable management of the archipelago's resources and to actively take part in protection, conservation, development and resource utilisation decisions, as it is provided for by the 2006 Law on Fisheries (Article 59), if decisions about major resource utilisation, such as the Royal Group's masterplan, are made without the CFIs consultation. Ultimately, the implementation of the development plan is likely lead to the failure of the archipelago's three established CFIs.

7.1.4 Impacts on Measures of Conservation

Proposed Marine Fisheries Management Area

The proposed KRA-MFMA, presented in chapter 6.2 of the baseline assessment, is being planned since 2012 and at the time of data collection for this research, is reportedly on the brink of getting signed by the central government (Respondent C; Respondent H; Respondent I). Once established, the MFMA would be the country's first of its kind and therefore supposed to function as "[...] a model MFMA for conservation of marine biodiversity, sustainable fishing and tourism, contributing to poverty reduction" with specific goals and objectives, touching upon the archipelago's biophysics, socio-economy and governance, as listed in Appendix A (Mulligan & Longhurst, 2014, p.79).

However, while studying the design, goals and objectives of the proposed MFMA, the researcher found a number of factors that most likely will collide with the implementation of the Royal Group's masterplan and therefore compromising the MFMA's effectiveness. This finding was confirmed by the fact that only one out of the twelve respondents, an official involved in the organisation of the proposed MFMA (Respondent H), stated that the MFMA and the Royal Group's intention could be implemented simultaneously without compromising each other. The respondent associated to CBRE Cambodia (Respondent B) could not comment on the issue due to the fact that the proposed MFMA was not known to the respondent. The remaining eleven respondents believed that the proposed MFMA and the Royal Group's intentions of development would not be compatible. Hereby direct degradation and disruption of coastal ecosystems such as mangrove forests, seagrass beds and coral reefs during construction work as well as indirect impacts such as eutrophication, siltation, pollution in line with the future operation of tourism facilities were believed by the

respondents to be the main reasons for the incompatibility of the proposed MFMA zoning plan and the Royal Group's masterplan.

The researcher found that the most outstanding and most presumable conflicting factors of the MFMA design concern the areas assigned as Conservation Areas. The definition of the term Conservation Area in the context of the proposed MFMA and as defined by the 2006 Law on Fisheries, is that any activity that has a negative effect on any marine organisms, living or non-living fauna and flora is strictly prohibited except for permitted scientific research (FiA, 2007a). Therefore, it is likely that the areas assigned as Conservation Area along Koh Rong's coastline will experience noncompliance along with coastal development. Especially problematic are the two largest Conservation Areas (no. 2 and 23), due to the fact that they are assigned by the TWG-MFMA in the exact same location where the Royal Group plans to develop the two largest marinas. Furthermore, most areas assigned as Multiple Use Areas are likewise prone to miss their aim, as in the context of the MFMA they are defined by the guidelines for the establishment and management of coral reef ecosystems in the Kingdom of Cambodia, meaning that coastal development is allowed, provided it does not destroy reefs (Mulligan & Longhurst, 2014). Due to the high coral cover within some areas assigned as Multiple Use Areas, especially along the north-western coast, coastal infrastructure development most likely will have negative effects on the adjacent reefs.

8 Discussion

The respective sub-assessments of the preparative study conducted by the researcher provide a comprehensive insight into the current situation within the study area, regarding the biophysical and human environments, management and uses, proposed measures of conservation and, for the first time, the planned tourist infrastructure development.

8.1 Findings of the Preparative Research's Sub-assessments

8.1.1 Findings of the Baseline Assessment

The baseline assessment revealed that the study area's environment is composed of multiple individual but interconnected terrestrial, coastal and marine ecosystems. The high number of different ecosystems facilitates a high biodiversity, including numerous globally endangered and nationally protected as well as some endemic species. However, little is known about the study area's terrestrial environment, due to the fact that little research on the topic has been conducted so far and knowledge about the terrestrial ecosystems almost only exists in the form of local expertise. Marine ecosystems, on the other hand, have recently attracted more interest and attention from the government and several national and international NGOs in preparation of the country's first MFMA, which aims to protect important marine habitats, the inhabiting species, as well as the livelihood of the about 1700 villagers, while bringing forward sustainable tourism. In recent years, the relatively undeveloped island has attracted large numbers of tourists with its pristine and natural character. With the growing popularity of Koh Rong amongst tourists, tourism is becoming an important source of income for the population, in addition to subsistence fishing and agricultural activities.

Along with the growing tourism industry in the area, a significant number of guesthouses settled on the island. Most of the newly established guesthouses, however, lack basic infrastructure such as sewage treatment systems or waste management facilities, compromising the wellbeing of the visitor-attracting environment they rely on.

This situation is rooted mainly in the largely uncoordinated rush of many businesses to settle on the island before it loses its pristine character through development and before land prices increase many times over due to the island's growing prominence. On the other hand, the unclear landownership situation between operating businesses and the concessioner is holding businesses back from investing in long lasting and environmentally-friendly infrastructure.

8.1.2 Findings of the Conservation and Development Plan Assessments

Conservation and development interests within the study area lie very close together.

After around four years of planning the country's first MFMA, in the late 2015, a thoroughly elaborated multiple-use zoning map, aiming to facilitate the accomplishment of a number of MFMA goals, is on the brink of being approved by the central Cambodian government. Multiple on-site community consultations, provincial and private sector consultations, as well as national consultations, combined with the compilation and incorporation of biophysical and socioeconomic data, collected via extensive surveys conducted by local and international researchers, scientists and consultants, together lay the foundation for "[...] a model MFMA for conservation of marine biodiversity, sustainable fishing and tourism, contributing to poverty reduction" (Mulligan, & Longhurst, 2014, p 79).

At the same time, the concession holder of Koh Rong has made ambitious plans to transform the biggest island within the proposed MFMA into a luxury resort island, by converting around 70% of the surface area into high-end tourism infrastructure, supported by the government's effort to promote the country's coast as the new Indochinese Riviera.

Both plans are expected to be implemented simultaneously.

8.1.3 Findings of the Perception Assessment

The perception assessment of the representatives of four different stakeholder groups towards the concessioner's development vision has revealed that there is a widespread discontent with the planned development. Support for the project was found to be low – the local population is afraid of being evicted from their villages, local businesses group together to oppose the concessioner and local environmental NGOs fear for the archipelagos ecosystems. However, it has also become clear that improvement of the island's infrastructure, in connection with reasoned and transparent tourism development and related opportunities for income generation would be endorsed by the local population.

The only stakeholder that shows support for the development plans are the local authorities, hoping that the advantages and benefits of the announced development will bring a significant amount of financial means to the area and provide an improvement of infrastructure.

8.1.4 Findings of the Comparative Assessment

The assessment of a similar but more advanced tourism infrastructure development project within a protected area, that aims “to create a catalyst for economic improvements in the region, without compromising the area’s natural assets or the traditional lifestyle of the local people” (Union Group, 2011a) has shown that situations in Cambodia, in which conservation and development interests lie very close together, do not always accomplish the desired goals. The assessed on-going tourism infrastructure development of the Tianjin Union Development Group has had a number of negative unwanted environmental and social consequences, especially concerning the local population, even though EIAs and SIAs were conducted and large amounts of money had been invested in the relocation and compensations of the affected communities (Titthara & Boyle, 2014b).

8.2 Discussion of the Potential Impacts

The information collected about the study area’s environment, the different intentions of resource utilisation and the stakeholders’ perception towards the planned infrastructure development, combined with the analysis of a similar situation of conflicting interests allowed the estimation of potential environmental and social impacts related to the planned development on the study area’s environment, its population, management structures and effort of conservation.

The outcome of the preparative research implies that besides the potential benefits of improved basic infrastructure and the potential creation of tourism-related income opportunities, the Royal Group’s large-scale infrastructure development project is expected to have a number of negative environmental and social impacts within the study area, if implemented as planned. These impacts affect the environment, as well as the area’s population, potentially leading to serious human rights issues and compromising existent management structures. Furthermore, the implementation of the masterplan most likely will impede the achievement of many of the MFMA’s goals, once the MFMA is established.

The researcher considers that the most plausible reason for the expected adverse environmental and social impacts are rooted in the seemingly non-existent communication between the concessioner and the vast majority of stakeholders. The Royal Group's failure to involve the local population in their intentions, for example, has resulted in disinformation regarding the planned development, and leaving the population in suspense and uncertainty about their future, while fuelling the rumour mill of imminent peril. Sporadically happening and unannounced site clearings in the proximity of villages, therefore, have given rise to protests and turmoil within the population.

Mutual non-consideration and non-communication of their intentions between the concessioner and the TWG-MFMA was found to be the major reason for the expected conflict between the two projects. Furthermore, the lack of communication leaves already collected biophysical and socioeconomic data unnoticed and unused, even though it would be useful for project planning and design. Data about Koh Rong's demography, available to the TWG-MFMA, for example, would be useful for CBRE Cambodia and the Royal Group in order to integrate existing villages in the masterplan, therefore avoiding and preventing stir-causing evictions. Likewise, biophysical data about the island's environment could be used by the CBRE Cambodia and the Royal Group to revise some potentially inadequate planned infrastructure. *Vice versa*, sharing the information about the planned infrastructure could enable the TWG-MFMA to incorporate that information within the design of multiple use-zoning map. However, at the time being, the concessioner and the majority of stakeholders are working against each other, by impeding each other's intentions and by holding back information that is crucial for a future sustainable development with mutual benefits for the conservationist and the developer.

9 Management Recommendations and Suggestions for Future Research

9.1 Stakeholder Meetings (Level the Playing-Field)

To prevent the potential unwanted adverse environmental and social impacts within the study area that are mainly a result of lack of communication between stakeholders and insufficient knowledge about each other's intentions, urgent stakeholder meetings are needed to bring together the different interest groups, in order to set the stage for future sustainable development. The focus of these stakeholder meetings should be the reciprocal and transparent presentation of the respective stakeholder's interests, intentions and plans, in order to remove any ambiguity and to locate conflicting interests as well as common goals. Furthermore, all parties ideally should agree to share existing biophysical and socioeconomic data, in order to facilitate first adjustments in both conservation and development plans due to the possible early recognition of partially unfeasible project design.

To effectively implement the suggested conditions of stakeholder communication, the meetings should create and utilise a Structured Decision Making framework approach (Gregory et al., 2012). This approach is known as an inclusive, participatory decision-making process apt to increase the transparency by which decisions are made, and provide an opportunity for trade-offs to be discussed in a tangible way, and promote consensus building.

Since all stakeholders, namely representatives of the local communities, businesses, authorities, as well as local and international NGOs are already coming together in monthly-arranged TWG-MFMA meetings, the stakeholder meetings, which include representatives of the Royal Group as the concessioner and CBRE Cambodia as the concessioner's advisor and marketer of the island, would not have to be organised from scratch.

9.2 Revising, Rescaling and Synchronising

Once the situation is clarified and any doubts about the respective stakeholder's intentions are eliminated, the points of major conflicts and impacts can be addressed in order to revise and rescale the development plan, as well as to synchronise it with the conservation plan.

The following steps that should influence the adjustment of the masterplan are recommended by the researcher:

- Clarification of the land rights situation with the local population, as well as the landownership situation with operating businesses,
- Involvement of the local population and possibly operating businesses in the planning process of development and conservation,
- Setting of targets for the reduction of preliminary assessed environmental degradation and
- Synchronisation with the proposed MFMA.

9.2.1 Acknowledgement and Involvement of the Local Population

In order to guarantee the success of long-term sustainable eco-tourism it is crucial for the development to have the endorsement and support of the local population (Moyle et al., 2011). Competition for space, infrastructure and key resources can quickly turn into resentment towards the developer and the tourists themselves (Moyle et al., 2011). The potential for friction is especially high within island environments due to the temporal and spatial boundaries in which the developer, visitors and locals interact (Moyle et al., 2011). Therefore, it is recommended to acknowledge existing villages and their inhabitants as well as to assure their priority access to important common-pool resources, such as forests, agricultural land and fishing grounds. Furthermore, it is of great importance to empower the local population by actively involving them in the development and management of the new economic development of Koh Rong. The members of communities should be involved in the planning process, and they should be given access to improved infrastructure such as healthcare, education and public transportation (as they become available). Long-term income opportunities should be created with the aim to modernise and improve their livelihoods. The villagers informed the researcher that eco-tourism developments, along with opportunities for income generation and improved infrastructure, generally would be endorsed and Koh Rong's population would support the development project, provided that the mentioned conditions were created. Once the communities' rights are secured and the population is involved in the development, even the potential relocation of villages might become a debatable topic.

9.2.2 Clarification of Landownership between Concessioner and Operating Businesses

The unclear landownership situation on Koh Rong has resulted in a number of adverse environmental impacts, especially along the southern coast, as businesses were reported to be discouraged from investing in new, more sophisticated infrastructure. A clear decision and agreement about which businesses are allowed to operate in and where on Koh Rong, followed by a clear demarcation of land allocated to the concessioner and land used by other operators, is needed to stop the uncoordinated settlement of mostly foreign owned businesses, smoothing out disputes and enabling planned long-term development. Initially, the concession over the entire island was granted to the Royal Group. However, the interviewed informant from CBRE Cambodia (Respondent B) has informed the researcher that the areas in which businesses started to operate in recent years might be cut out of the concession, in order to avoid lengthy conflicts. This can be seen as a first possibility of coming to an accommodation. Along with the clearly defined and legally fixed land ownership, the researcher recommends introducing binding environmental standards for infrastructure building and use, valid for all future businesses as well as for already existing ones.

Furthermore, it is recommended to integrate the already established businesses in the overall development plan of Koh Rong, as they possess important local knowledge and operate already existing transportation infrastructure for visitors and for the supply of goods between Koh Rong and the mainland. The advantage for already operating businesses of cooperating with the Royal Group should be, amongst others, the access to a wider customer range, benefits from improved island infrastructure and the qualitative improvement of their sales pitch.

9.2.3 Reconsideration of Environmental Impacts and Feasibility of Planned Site Development

With the newly gained biophysical data about the island's environment obtained through the suggested initial stakeholder meetings, the feasibility of planned site development and land use should be verified. Golf courses, for example, could turn out not to be feasible under the given environmental circumstances, even without conducting extensive studies and expensive measurements on the island's hydrological properties. Early identification of such

potential unfeasible planned site developments would contribute to a future better flow of project implementation.

Furthermore, site development with direct and obvious adverse environmental impacts should be reconsidered. For example, site-specific cases, like the construction of a marina on top of the archipelago's largest known seagrass bed, should be reconsidered, as should larger cases, such as the conversion of 70% of the island's surface area, as both will have obvious negative impacts on Koh Rong's natural environment, the flagship of the island. Reducing the area of converted evergreen forest would also suit better the Royal Group's advertisement of "the green dream island" (Royal Group, 2010).

9.2.4 Synchronisation with the Proposed MFMA

In order to be mutually beneficial to each other, the development plan and the proposed multiple-use zoning map of the MFMA need to be synchronised. Therefore, it is recommended that the Royal Group as well as CBRE Cambodia actively take part in the TWG-MFMA meetings. If the stakeholder meetings, suggested in chapter 9.1, are well arranged, the Royal Group will benefit from intact ecosystems and their services, while the TWG-MFMA will be provided with increased financial means available for MFMA management, through collected visitor and concession fees, for example.

9.3 Proactive Implementation of Environmental and Social Impact Assessments

As soon as the aforementioned factors have been taken into consideration and incorporated in the revised masterplan, an EIA has to be conducted as required by the Cambodian law under Chapter 3, Article 6 of the 1996 Law on Environmental Protection and Natural Resource Management, by following the requirements of the 1999 Sub-decree on the Environmental Impact Assessment Process. However, instead of applying the 1996 Law in combination with the 1999 Sub-decree, the researcher recommends the Royal Group to adapt an exemplary function, by Cambodian standards, by proactively applying the current fifth draft of the Law on Environment Impact Assessment. As stated in chapter 2.3.3 of this study, the Law on Environment Impact Assessment is still in the process of development but, according to Schulte and Stetser (2014), if implemented, its most current fifth draft has the potential of being the most robust EIA law within the Mekong Sub-region. By doing so, the Royal Group would credibly emphasise its intention of developing "the world's premier eco

resort island planned from the ground up” by applying “the highest standards of ecological sustainability” in order “to create a truly ecologically sustainable large-scale resort community” (Royal Group, 2010). The EIA should, therefore, be implemented as early as possible, in order to guide the further design of the masterplan, by identifying additional opportunities and constraints within the island’s biophysical and human environment and by continuing to accumulate data throughout the entire project cycle, monitoring the implementation process and, if necessary, suggesting mid-course corrections. The presented research can be used as the basis for such a comprehensive and extensive EIA conducted in the future.

9.4 Establishment of Research Facilities

Due to the so far little conducted research about Koh Rong’s marine and especially terrestrial and coastal ecosystems, the researcher recommends to dedicate greater attention to this issue by using the presented study as an avenue for future research. Furthermore, due to the fact that Koh Rong offers particularly suitable conditions for, amongst others, the research on island ecology, endemic species, links between terrestrial and marine ecosystems, effects of human interaction, as well as on the effects of the MFMA’s marine zonation on habitats, it is suggested to incorporate into the masterplan an island’s own research park, including research and education facilities for the accommodation of local and international research groups, field courses and educational classes. Model research stations could be, for example, the Heron Island Research Station¹², located on the Great Barrier Reef, the Korallion Lab¹³, located in the Maldives as well as the famous Charles Darwin Research Station¹⁴, located on the Galapagos Islands, all attracting both tourists and researchers. That the Koh Rong Archipelago already attracts the interest of such international research teams is seen for example with the one month Expedition Sanloem 2013, organised by students of the universities of Exeter and Falmouth, UK, that focused on the terrestrial and coastal habitats of Koh Rong Sanloem (Toulson et al., 2013). Another UK-based team that visited the archipelago was the CCC research team that collected data in a two-year lasting project about

¹² <http://www.uq.edu.au/heron-island-research-station/>

¹³ <http://www.korallionlab.com/korallion-lab/>

¹⁴ <http://www.darwinfoundation.org>

the archipelago's marine habitats (Van Bochove et al., 2012). Moreover, with Koh Rong's location in the heart of the country's future first MPA, the establishment of a research station would very likely be highly supported and welcomed by the government. In the end, devotion to science would be the most effective promotion of the Royal Group's vision of "creating an environmentally aware paradise" (Royal Group, 2010).

10 Conclusion

As expected, the present research has provided evidence of a particularly distinct dilemma of exploitation versus conservation within the Koh Rong Archipelago, where a planned large-scale tourism infrastructure development, advertised as ecologically sustainable and environmentally aware, was found to most likely have numerous adverse effects on the environment and the local population, jeopardising the natural setting it is built on and, therefore, challenging its feasibility and full implementation. The dilemma is intensified by the fact that the development is planned to take place in the heart of a soon-to-be established MPA, which aims to conserve the ecosystems that inevitably will be negatively affected. Briefly said, both intentions of resource utilisation are impeding each other, as well as themselves from being successfully implemented. A lack of knowledge about local circumstances as well as unintentional or, to some extent, possibly intentional non-communication and disinformation were found to be the main reasons for this no-win situation. However, by conducting the research it has also become clear that both sides, the developer and the conservationist, share common goals, such as sustainable tourism development, the provision and benefit of valuable ecosystem services, as well as a smoothly running project implementation. Building on these common goals and making use of shared knowledge, skills and ideas, by working together instead of against each other, both parties will get closer to the successful implementation of their intentions.

The study has also shown that the tool of ESIA is a suitable instrument of linking the conservationists' and the developers' interests, by creating and disseminating knowledge about specific environments, their populations and the impacts that modifications will have on both, as well as by detecting unrecognised opportunities and alternative options. In the case of Koh Rong, the researcher was able to provide information about identified potential unwanted consequences of the planned development and the current situation in general,

which all together could form the basis for a future convergence between the developer and the conservationists.

With the concession of Koh Rong, the Royal Group has the opportunity to adopt a vanguard role by breaking with the present trend of environmental degradation, loss of ecosystem services and rising human rights issues that are connected to the majority of development efforts in Cambodia and internationally. This study indicates that the proactive application and compliance with available ESIA standards would be a major strategic measure for the Royal Group's realisation of sustainable development.

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Appendix A

KRA-MFMA Goals and Objectives

Biophysical:

- Marine fisheries resources sustained
 - Population of target species for extractive or non-extractive use restored to or maintained at desired reference points
 - Populations of target species for extractive and non-extractive use protected from harvest at sites and/or life history stages where they become vulnerable
 - Over-exploitation of living and/or non-living marine resources minimized, prevented or prohibited entirely in Conservation Areas
 - Catch yields improved or sustained in fishing areas adjacent to Conservation Zones
- Biological diversity protected
 - Ecosystem functions protected, restored and maintained
 - Rare, localised or endemic species protected
- Habitat protected and restore
 - Habitat quality and/or quantity restored or maintained
 - Ecological processes essential to habitat existence protected
 - Unnatural threats and human impacts eliminated or minimized inside the MFMA

Socioeconomic:

- Food security maintained
 - Households have enough food to feed all members throughout the year
 - Households have enough seafood for home consumption
- Livelihoods enhanced and diversified
 - Total household income is maintained or increased
 - Range of livelihood activities diversified
 - Relative importance/proportion of income from tourism increased
 - Traditional family fishing practices maintained
- Benefits from MFMA equitably distributed

- Food security, income and livelihoods benefits are felt by all members of the community
- Poorer and traditionally marginalised members of the community are adequately represented governance/decision-making structures & processes
- Environmental awareness & knowledge enhanced
 - Increased local knowledge about the impact of waste
 - Understanding of marine biological processes and MFMA impacts improved
 - Understanding of fisheries by-laws for CFi and MFMA improved
 - Public's understanding of environmental and social 'sustainability' improved

Governance:

- Effective legal and management structures and strategies maintained
 - Rules for resource use and access clearly defined and enforceable
 - Compatibility between national and local (CFi) arrangements maximised Human and financial resources sufficient and used efficiently and effectively
 - Periodic monitoring, evaluation and effective adaptation of management plan ensured
 - Adequate legislation exists and is compatible with international, national and local rights and obligation
- Effective stakeholder participation and representation ensured through co-management
 - Representativeness, equity, and efficacy of collaborative management systems ensured.
 - CFi membership capacity effectively built in order to be able to participate in management
 - Community organising and participation strengthened and enhanced
- Resource user compliance to MFMA regulations enhanced
 - Participatory surveillance and monitoring of MFMA improved
 - Willingness of people to respect and comply with zoning scheme
 - Local and national laws and regulations are adequately applied and enforced
 - Management plans are simple and accessible

Appendix B

Main topics discussed within the recorded unstructured and semi-structured interviews

Main topics discussed within recorded unstructured interviews:

- Respondents' involvement and role in the study area
- Observations of general development and changes within the study area in the past
- Situation today in the study area (population, environment, local businesses etc.)
- Knowledge about proposed MFMA
- Perception towards proposed MFMA
- Knowledge about planned development
- Perception towards planned development
- Opinion on general perception of other stakeholder towards planned development and proposed MFMA
- Opinion on potential social and environmental impacts on the study area, related to the planned development (positive and negative)
- Suggestions for improvement of the masterplan implementation
- Simultaneous realisation of MFMA and masterplan?
- General situation in Cambodia regarding land concessions and related issues

Main topics discussed within the recorded semi-structured interviews:

CB Richard Ellis (Cambodia) Co., Ltd.:

- Role of CBRE in the Koh Rong development plan
- Details on the concession granting (date, circumstances, agreements, authorities involved etc.)
- Situation today in the study area (population, environment, local businesses etc.)
- The Royal Group's vision of Koh Rong
- Design of latest masterplan
- Details of the masterplan (land use, design of planned infrastructure)
- Implementation stage of masterplan
- Role of local businesses
- Role of local population
- Obstacles along the realisation
- Land rights of the local population
- Land disputes with local businesses
- Conducted EIA
- Environmental impacts related to the planned development (positive and negative)
- Social impacts related to the planned development (positive and negative)

- MFMA
- Simultaneous realisation of MFMA and masterplan?

Local Business:

- Involvement and role of the business within the study area
- Situation today in the study area (population, environment, local businesses etc.)
- Knowledge about planned development
- Perception towards planned development
- Environmental impacts related to the planned development (positive and negative)
- Social impacts related to the planned development (positive and negative)
- Land rights of the local population
- Land disputes with the Royal Group
- Potential collaboration with the Royal Group
- Knowledge and perception towards MFMA
- Simultaneous realisation of MFMA and masterplan?

Human Rights NGO:

- Human rights issues related to land concessions in Cambodia
- Knowledge about the study area and the Koh Rong concession
- Similar cases (concessions granted for coastal tourism infrastructure development)
- Estimated consequences for the local population related to the planned development (positive and negative)
- Possible development approaches that could be beneficial for the local population

Environmental NGO:

- Environmental degradation related to land concessions in Cambodia
- Knowledge about the study area and the Koh Rong concession
- Similar cases (concessions granted for coastal tourism infrastructure development)
- Estimated consequences for the environment related to the planned development (positive and negative)
- Possible development approaches that could be beneficial for study area`s environment



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