

Local Involvement in Marine Conservation, Motivating Factors, and the Potential
for Co-management in Koh Lipe, Thailand

by

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Abstract

This thesis examines the impact of tourism on marine conservation in Koh Lipe, an island in southern Thailand. The objectives of this study were to (1) understand the social and environmental changes that occurred on Koh Lipe in recent decades and how these changes are impacting the marine environment; (2) investigate ongoing conservation efforts, and how local stakeholders are involved and envision a form of marine conservation responsive to their needs; (3) determine the values motivating and driving local-level engagement in marine conservation-related activities; and (4) explore the implications of the case study findings on conservation-development in Koh Lipe and reef-based tourism. The factors observed to contribute to marine degradation included overfishing, island infrastructure development and tourism activities. Community-based and co-managed conservation approaches have emerged to address these issues but local involvement is limited. Management implications aim for biodiversity conservation to be improved and linked to sustainable local livelihoods.

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Chapter 1

Introduction

1.1: Introduction

This case study focuses on understanding the role of the local community in the management and conservation of the marine environment on Koh Lipe, a small island in southern Thailand. It aims to identify the social and environmental changes that have occurred since the creation of a national marine park and the introduction of mass tourism, explore how the local community is addressing related marine conservation issues, and understand the factors motivating them to do so. Chapter 1 will provide background information on the research topic, state the purpose and objectives of the study, and report the significance and limitations of the study.

1.2: Background

Some of the most species-rich and productive marine ecosystems in the world exist on the Andaman Coast of Thailand (Bennett and Dearden, 2013; Juntarashote, 2005; Project IMPAACT, 2015; World Heritage Nomination Document, 2010). Climate change, world population growth, and globalization place this region under a wide range of pressures that are threatening the health and productivity of coastal ecosystems (Bennett *et al.*, 2014a). These pressures, which will only increase over time, include overharvesting, pollution, the extraction of specialty products, erosion, eutrophication, increased ocean water temperatures and acidification, as well as extreme weather events (Bennett *et al.*, 2014a; Berkes *et al.*, 2006; Juntarashote, 2005). For coastal communities that rely on healthy coastal ecosystems to sustain their livelihoods, whether it be for tourism, commercial, or small-scale fishing, failure to respond to these pressures through conservation efforts could pose major problems for future generations (Bennett *et al.*, 2014a; Project IMPAACT, 2014).

Koh Lipe is a small island located in the southern portion of the Andaman Coast in the Satun Province of Thailand. It is the most southern island in Thailand and one of ten islands that compose the Adang Archipelago. Over the past several decades, Koh Lipe has undergone rapid changes as it transformed from a quiet and undeveloped destination for local Thai people, to an international tourist hot spot (“The Chao Ley,” 2005; Wongbusarakum, 2002). The island has gained popularity for tourists due to its pristine, “untouched” beaches and its location next to Tarutao National Marine Park, a nationally protected area of over 1500 km² with 50 uninhabited islands (“Tarutao National Park”, 2015; Wongbusarakum, 2002). The national marine park is rich in biodiversity and offers many incredible SCUBA diving and snorkeling sites (“The Chao Ley”, 2005). On Koh Lipe, SCUBA diving is one of the largest industries with twelve local businesses offering diving certification and tours in the marine park.

Like other coastal communities around the world, Koh Lipe is experiencing global pressure related to climate change, fisheries declines, and general environmental degradation (Bennett et al., 2014a; Bennett et al., 2014b). On the Andaman Coast of Thailand, where Koh Lipe is located, the deterioration of marine ecosystems and fisheries has already begun as a result of pollution, coastal development, overfishing, and destructive fishing practices (Project IMPAACT, 2015; Bennett *et al.*, 2014b; BOBLME, 2011). On Koh Lipe, with development for tourism occurring at such a high rate, the risk of related impacts such as natural resource depletion, waste and pollution generation, fresh water reduction, critical habitat destruction, and consequential loss in biodiversity, are very high (Fennell, 2008; Wong, 2004; Shaw and Williams, 2002; Wongbusarakum, 2002). Prior to this study, published literature and articles showed Koh Lipe had begun experiencing issues related to waste management, biodiversity conservation and fresh water supply due to a lack of prior management or conservation planning (“The Chao Ley”, 2005,

Wongbusarakum, 2002). Considering the biological importance of this region and the livelihoods on Koh Lipe upon which it depends, it is very important to address these resource management issues and aim for effective and sustainable management.

1.3: Purpose and objectives of research

This research followed the objectives of the Community Conservation Research Network (CCRN), an international network of researchers that engages in local-level and community-based research activities and capacity building in 11 study sites around the world. The study adopted one of the CCRN's main research goals, "to better understand and support community engagement in solving local level environmental challenges and ensuring sustainable local livelihoods" (CCRN, 2014; n.p).

With the majority of people living on Koh Lipe relying on fishing or marine-based tourism for their livelihoods, the main goal was to understand how the local marine environment is being affected by changes related to mass tourism and the role of the local community in resolving related issues and managing marine resources. By exploring these topics, I aimed to determine if and how Koh Lipe may approach simultaneous conservation and sustainable development, including building sustainable local livelihoods.

The main objectives of the research are:

1. Understand the environmental and social changes that have occurred on Koh Lipe in recent decades and how these changes are impacting the marine environment;
2. Investigate ongoing conservation efforts and how local stakeholders are involved and envision a form of marine conservation responsive to their needs;
3. Determine the values motivating and/or driving Koh Lipe community members to engage in activities that aim to conserve and protect the local marine environment; and

4. Explore the implications of the case study findings on conservation-development in Koh Lipe and reef-based tourism.

1.4: Research significance and limitations

This study will contribute to the CCRN's efforts to build knowledge concerning the involvement of local communities in conservation activities. The project involves one of the CCRN's main themes: motivations for conservation. By examining motivations, we can understand what motivates people to conserve, who is motivated to conserve, and how motivations for conservation are linked to concerns for sustainability, livelihoods and economies (CCRN, 2014).

The results of this study will be made known to community, non-governmental organizations (NGOs) involved in this region, and provincial leaders with hope it might contribute to addressing environmental management problems, developing the area more responsibly, improving livelihoods, and creating a more resilient future for the community of Koh Lipe. The findings of this project could potentially be applicable in other coastal communities that are currently or may in the future be placed under similar developmental pressures.

1.5 Organization of thesis

This thesis has been organized into six chapters, this being the first. Chapter Two describes the study area and methods used to collect and analyze research data. Chapter Three provides a review of the literature to familiarize the reader with theoretical concepts and case study examples that relate to this research. Chapter Four is based on the first research objective and aims to outline environmental and social changes that have occurred on Koh Lipe in recent decades and how these changes are impacting the marine environment. Chapter Five is based on the second and third research objectives of this study and describes how individuals and groups

in the Koh Lipe community are making efforts to address marine conservation issues, the values motivating their engagement in conservation activities, and how they believe marine conservation efforts on Koh Lipe could be improved. Chapter Six discusses the research findings and their implications on conservation-development in Koh Lipe and reef-based tourism in general.

Chapter 2

Study Area and Research Methods

2.1: Introduction

The first chapter has provided the background information, purpose, objectives, study area information, significance and an outline of the research methods. Chapter two provides a detailed description of the research methods utilised for the research project. It will summarize the philosophical worldview that guided the research, the research design, strategy of inquiry, data collection methods, sampling technique, verification of data, and how the data was analyzed. This chapter will also outline limitations of the study and a summary of the ethics procedures

2.2: Study Area

This study took place in Koh Lipe, Thailand. Koh Lipe is located in the southern portion of the Andaman Sea at 6°29'14.8"N latitude and 99°18'15.9"E longitude (Figure 2.1). The island is 60 kilometers west from the mainland of Thailand and has an area of approximately four kilometers squared (Wongbusarakum, 2002). It is the most southern island in Thailand and one of ten islands that compose the Adang Archipelago (Figure 2.2). Aside from Koh Lipe, the islands in the Adang Archipelago are located inside a nationally protected park called Tarutao National Marine Park. Tarutao National Marine Park was created in 1974, is 1500 km², and includes 50 islands. Koh Lipe is the only island in Tarutao National Park inhabited by people, other than those where official staff of Tarutao National Park are required to live.

At the time of this study, the population of Koh Lipe was approximately 1400, with 800 being members of the Chao Ley community (Pakbara, pers. comm., 2016). An inventory of local businesses on Koh Lipe from 2013 showed there to be 170 different establishments including but not limited to resorts, hotels, restaurants, bars, SCUBA diving companies, and general stores.

Thailand was selected as the research country based on my own previous experience doing marine conservation work in Koh Tao, Thailand. Koh Tao, a bigger and more populated island than Koh Lipe, has very effective community-based management of coral reef resources. Prior to this study, little information about conservation efforts on Koh Lipe was available (in English); however, it was known to be a popular destination for SCUBA divers due to its location in the species-rich Andaman Sea. Considering the importance of the Andaman Sea for global biodiversity, the success of community-based marine conservation efforts on other islands in Thailand, and the fact that the population of Koh Lipe relies so heavily on the coral reefs for their livelihoods, both for fishing and tourism, there appeared to be potential for community-based conservation or co-management to help achieve simultaneous development for tourism, protection of the coral reefs, and sustainable livelihoods. Additionally, with little available information about this unique island community (in English), this study presented an opportunity to fill a gap of knowledge.

The island of Koh Lipe also came recommended as a research site by Dr. Philip Dearden, a Community Conservation Research Network member who has 30 years of experience doing research in Thailand. Dr. Dearden visited Koh Lipe prior to 2015 and found strong support for a study of this nature after speaking with community members and conservation organizations in the area.

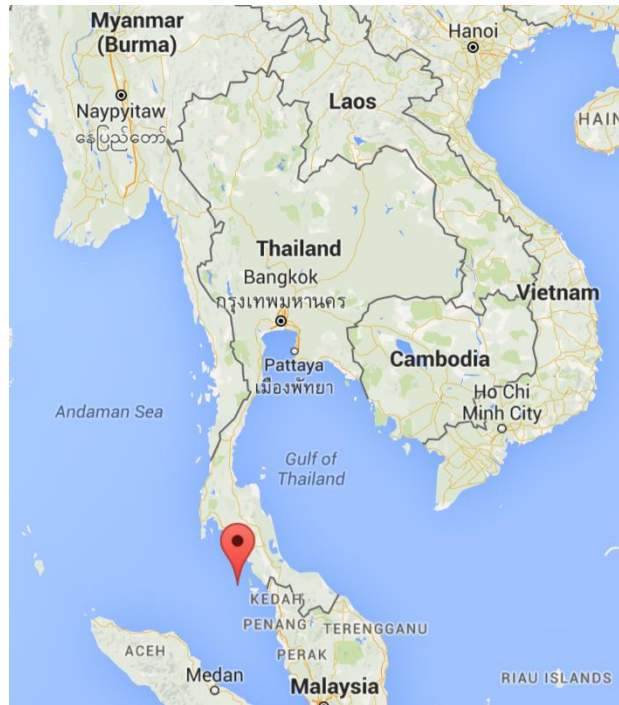


Figure 2.1: Location of Koh Lipe in Thailand (Google Maps, 2015)

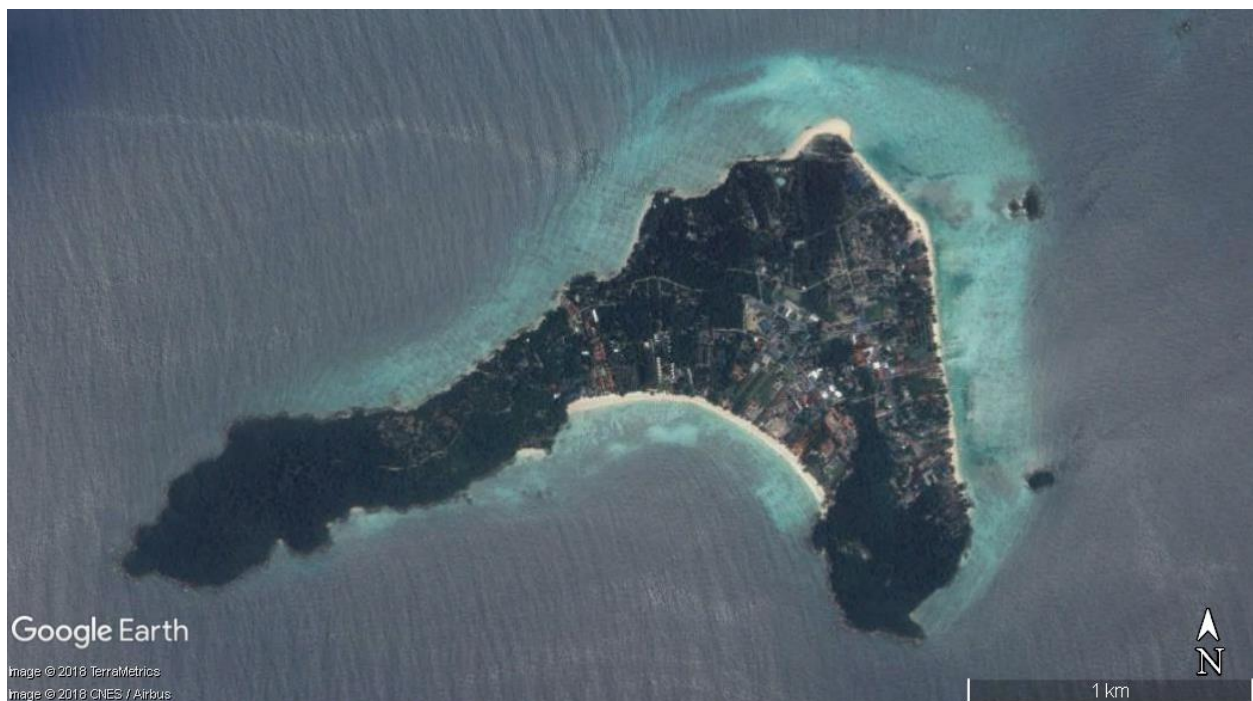


Figure 2.2: Island of Koh Lipe (Google Earth, 2018)

2.3: Philosophical worldview

This study was largely guided by principles of the constructivist worldview; however, elements of the transformative worldview also became applicable. Social constructivists assume that individuals “seek understanding of the world in which they live and work,” (Creswell, 2009; p. 8). Therefore, each individual’s experiences allow for understandings and meanings to be developed towards certain objects, things, or environments (Creswell, 2009). In research guided by this worldview, the goal is to rely on participants’ views of the situation being studied (Creswell, 2009). Participants construct a meaning of the situation through open-ended questions, interviews and discussion and the researcher interprets these meanings based on their own experiences and background (Creswell, 2009). In this study, where I aimed to understand social and environmental changes that have incurred as a result of tourism introduction, ongoing conservation efforts, motivations for conservation, and changes community members wish to see in terms of marine conservation, a constructivist approach to research was ideal. I relied on discussion with community members to understand varying views of the situation and interpreted the information by identifying patterns and developing theory.

Though it was not planned, elements of a transformative worldview emerged during this study. The transformative worldview holds that in addition to gaining an understanding of a situation, the research inquiry should also incorporate an action agenda so that social oppression, at whichever level it is occurring, is effectively confronted (Creswell, 2014). It focuses on the needs of individuals or groups that are marginalized and has an agenda that may change the lives of participants, the institutions in which participants are involved, or the life of the researcher (Creswell, 2014). The research provides a voice for participants and aims to advance an agenda to improve their overall wellbeing (Creswell, 2014). In this study, participant views of social and environmental changes that emerged as a result of tourism introduction revealed that many people

living on Koh Lipe feel they have and continue to experience inequality, dispossession and limited access to resources. By giving a voice to participants who have experienced oppression, I aim to raise awareness and encourage action and change in regard to these issues in Koh Lipe, and prevent similar issues from occurring in the future, thus fitting into the transformative worldview.

2.4: Research Design

The research design and research objectives are linked. In this study, the objectives focused on identifying social and environmental issues, learning of ongoing conservation efforts, and understanding the values, motivations and drivers of conservation held by members of the Koh Lipe community. These findings helped me, and in turn the community, to understand how conservation can be improved at the community, industry, and government levels, and within civil society organizations. To meet these objectives, the research design for this project was qualitative. Qualitative research is “a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem” (Creswell, 2009; p. 4). Instead of testing theories and examining relationships between variables, as is done in quantitative research, qualitative research allows for the researcher to discover, interact with participants, understand their experiences, and determine how meanings are shaped through a culture (Corbin and Strauss, 2008; Creswell, 2009). Qualitative methods allow for the researcher to develop a deep understanding of all aspects related to the research problem within a limited time frame (Creswell, 2003).

2.5: Strategy of Inquiry

The strategy of inquiry that guided this exploratory research project was a case study. A case study “investigates a contemporary phenomenon within its real-life context and is especially useful when boundaries between the phenomenon and its context are not clearly evident,” (Fridlund, 1997; p. 3). Further, a case study looks at a particular issue in a specific setting and time

frame and utilises a diverse set of data collection methods, specific to the local environment, that enable the researcher to develop a deep understanding of activities, practices and processes that occur (Creswell, 2009). Given that this research aimed to examine an issue specific to Koh Lipe, a case study was deemed an appropriate strategy of inquiry.

2.6: Sampling Technique

Based on the purpose and research objectives of this study, purposeful samples were taken for data collection. In purposeful sampling, the researcher actively selects samples they believe will be able to answer their research questions (Marshall, 1996). Based on known information about the study area, observations made during the course of the study, and any available literature about the community, I approached community members and invited them to participate in the research (Marshall, 1996). I purposefully selected community members who were known or observed to have key roles in the community, specific experience, or particular expertise on the research topics.

The snowball sampling technique was also be used. Snowball sampling occurs when existing samples help recruit future samples from their own social group to participate in the study (Mack *et al.*, 2005). The technique allows the researcher to discover samples that may be difficult to locate or access (Mack *et al.*, 2005). The technique is similar to rolling a snowball in that an initially small sample group will grow with each sample (Golafshani, 2003). In this study, some individuals that were purposefully selected recommended that I contact specific people for the study (Marshall, 1996). Several individuals also volunteered to participate when they heard about the project and wished to contribute.

2.7: Data Sources

Prior to carrying out this study, I was only able to locate a few published articles about Koh Lipe (in English) regarding its population, resource management approach, environment, or economy. Due to this lack of secondary information, this study provided the primary source of data.

The study data can be grouped into the following three categories:

1. Interview data, collected using semi-structured interviews, key informant interviews and photo elicitation
2. Observational data, collected using participant observation
3. Secondary data, collected by reviewing online and published articles

Interview data was collected using a handheld recording device and hand-written notes. The interviews were transcribed to a digital file on a personal laptop computer. Observational data, including thoughts and impressions of each interview, were recorded in the researcher's field notebook. The field notebook was stored on a personal laptop and paper notebook. While in the field, I aimed to record field notes every day, with more detailed accounts on days with a lot of activity. I also kept a personal journal in order to separate thoughts from emotions once out of the field. Photographs were also used to record observations when the situation permitted. Secondary notes were reviewed on a personal laptop computer.

2.8: Data Collection Methods

Three types of data collection methods were utilised for this study: participant observation, photo elicitation, and semi-structured interviews.

2.8.1: Participant Observation

Participant observation was the first data collection method utilised. Participant observation describes a method where the researcher seeks to understand the multiple perspectives that exist in a study area through observation of and participation in the community's daily activities (Mack *et al.*, 2005). As Bernard (2000) writes, "...participant observation gets you in the door so you can collect life histories, attend rituals, and talk to people about sensitive topics" (p. 344).

By becoming a part of daily life for those living on Koh Lipe and allowing community members to feel comfortable in my presence, more accurate information could be collected. Being a Canadian and having limited knowledge of the culture and language, the participant observation period was a critical time for me to develop relationships and rapport with community members and determine who could possibly contribute to the research project. For the first two months, I relied on participant observation and informal discussion with community members to become oriented, build relationships with individuals in various social groups, and increase my understanding of the activities that took place in Koh Lipe each day. Examples of activities for which participant observation was utilised included tourist snorkeling trips, NGO organized events, biological monitoring activities, Chao Ley fishing trips, stakeholder meetings (conservation groups, dive centres, government), formal presentations, SCUBA diving trips, cultural celebrations and various other activities that took place on a daily basis.

Participant observation was a useful tool for me to determine whether participants' behaviours contradicted what they reported during semi-structured interviews (Mack *et al.*, 2005). For example, by going SCUBA diving with local diving companies, I could observe how diving guides, instructors, and tourists behaved underwater and compare my own observations to those

reported in semi-structured interviews. Further, by joining tour groups on snorkeling tours, I could observe how tour guides and tourists interacted with the marine environment and compare these observations with information reported by participants in semi-structured interviews.

Participant observation also allowed me to gain a familiarity with the culture and an understanding of the context that could only result from personal experience (Mack *et al.*, 2005). For example, by immersing myself in the daily lives of fishers, tour guides and those employed in the SCUBA diving industry, I could gain a better understanding of the dynamics that exist among these groups, and between these groups and tourists. Additionally, I could better understand individual feelings and values by forming relationships with individuals from various community groups.

Mack *et al.* (2005) identify three disadvantages of participant observation. First, it is very time consuming as it typically takes the researcher a lot of time to become an effective and trusted participant observer. I overcame this potential issue by working hard for the first two months to form meaningful relationships with the local people. I paid to go diving and volunteered my own time to assist several of the local dive shops in order to gain the trust and rapport of several leaders in the diving industry. Volunteering with dive centers also provided many opportunities to meet people working in the diving, fishing and snorkelling tour industries. I also volunteered with Reef Guardian and Trash Hero, two environmental conservation groups on Koh Lipe. By volunteering with these groups I was able to meet many of the people directly involved in conservation-related efforts and maintain a positive connection for the future. The use of other data collection methods also helped reduce time limitations.

A second disadvantage proposed by Mack *et al.* (2005) is the fact that the researcher must often rely on memory to record important data as it is usually too difficult to record while observing

and participating. As outlined above, in order to prevent memory-related errors and remain objective, I made sure to record field notes as much as possible in the field, and every evening. I also maintained a personal journal so I could separate my own thoughts and emotions from my personal experience from the observations made for research.

The third disadvantage reported by Mack *et al.* (2005), is the fact that it may be difficult for the researcher to remain objective when doing participant observation. A way in which I aimed to avoid this issue was carrying out participant observation in a wide variety of settings and in the company of various people. By seeking out different experiences and viewpoints, I could gain a better understanding of the whole system and better separate my own position from other peoples. Reflecting on field notes and my personal journal allowed me to recognize if my own emotions were incorporated into my data and reading the literature allowed me to connect general themes from my research data to situations elsewhere in the world.

2.8.2: Semi-structured Interviews

Semi-structured interviews enables a researcher find answers to all of the research questions. Semi-structured interviews have a predetermined set of questions and are guided by the researcher; however, the questions are open-ended, there is flexibility for participants to fully express themselves, and topics can be added or skipped depending on participant interest levels and expertise (Hay, 2005; Huntington, 1998).

In this research, semi-structured interviews allowed me to remain flexible with the conversation during the interview but focused on the questions that need to be answered (Hay, 2005). Furthermore, I was able to understand how perceptions of environmental management issues, as well as values, motivations and drivers differ between groups in the community. In order to ensure participants were comfortable and willing to speak freely, interviews were informal, held

in a public setting and I demonstrated genuine appreciation for and interest in responses to interview questions. During semi-structured interviews, I asked participants if they preferred to be represented in the study using their real name or anonymously. If they were comfortable using their real identity, they are referred to in this study by their first name and if they preferred to remain anonymous, I invented a pseudonym to represent them. Along with their name or pseudonym, I further identify them by indicating their personal background or profession.

A list of questions guiding the semi-structured interviews can be found in Appendix I. The questions were pre-tested with knowledgeable, key-informants and three translators to ensure they were clear and made sense. In order to ensure the interview data was reliable and valid, I made sure to emphasize the meaning of the question, rather than focusing on the exact wording of the interview questions. In instances where language created a barrier between me and the participant, this became especially useful. Unless the participant had an in-depth knowledge of the English language, a local translator was present so the meaning of the question could be effectively communicated. If a question was misinterpreted, the question was repeated until the true meaning was conveyed.

The interview data was collected from participants with diverse backgrounds. A summary of the interviews, organized by respondent type, can be found in Table 2.1. When purposefully sampling for participants, I sought out community members who I had observed to either work in the fishing or marine tourism industry or participate in marine conservation efforts on Koh Lipe. When I utilised snowball sampling, I sought out specific individuals who had been recommended by participants of the study or people with whom I had informal conversations in the Koh Lipe community. I met two participants through friends I had made in the diving community before visiting Koh Lipe. In general, I aimed to evenly select female and male participants; however, with

much of the fishing and marine-based tourism industries being dominated by male workers, I ended up with more male participants than female. The ratio of male to female participants in semi-structured interviews was 3 to 1. Once I introduced myself to a prospective participant and explained my purpose as a researcher, I asked if they would be interested in participating in the research project. On several occasions, people volunteered to participate in the research without me asking.

After two months of participant observation and semi-structured interviews, I identified several members of the community who held specific knowledge or a significant role in the community. These key informants became particularly valuable resources for information relevant to the study based on their unique positions of leadership, in local history, or their field of employment. These individuals were open to having multiple meetings with me so I could cross-check, get clarification, validate, or ask for more information about themes encountered in semi-structured interviews or behaviours observed during participant observation.

I recruited three different Thai residents of Koh Lipe to assist with translation during interviews. The main translator was a young woman originally from Trang, Thailand, named, Sareena. Sareena had been working as a receptionist at a hotel on Koh Lipe for over a year before she began assisting with translation for this research project. Working as a receptionist had given her much experience interacting with many local tour guides as she often spent days with them while accompanying hotel guests on snorkeling tours. Having Sareena present seemed to increase both the willingness of community members to participate and their comfort levels during interviews. Specifically, her down-to-earth, compassionate and enthusiastic personality appeared to make participants feel more at ease and willing to share information during interviews. The two other translators, a woman named Allie and man named Em, were originally from Bangkok and

both worked in the diving industry on Koh Lipe for over a year prior to assisting with this study. Their knowledge of the diving industry and marine conservation issues made it easy for them to translate the meanings of each interview question to participants. Their professional experience with tour guides and boat captains also helped to increase the comfort of participants and allow them to share information more openly.

During an interview that required translation, I would ask a question to the participant, the translator would relay the message to the participant in Thai, listen to the response and translate it to English for me to hear and record. I would then probe or ask for clarification on the response before moving onto the next question. With many interviews being carried out with assistance from a translator, exact quotations were not utilised to prepare this thesis – instead, quotations that represent the closest meaning to the response possible were presented.

Table 2.1: Total Number of Interviews by Respondent Type

	Diving community	Fishers and tour guides	Business owners or managers	Other tourism-related workers	NGO	Gov't staff
Semi-Structured Interview	6	7	8	4	1	
Key Informant	1	1	1	1	1	1
Photo Elicitation	2		1			1
Informal Conversation	10	4	5	10	6	4
Total	19	12	15	15	8	6

2.8.4: Photo Elicitation

Photo elicitation is an interview technique in which a researcher uses photographs to elicit individual responses from participants (Richard and Lahman, 2014; Collier and Collier, 1986). This method brings attention to unobservable phenomena in the research setting (Patton, 2002). It

brings a new dimension to the participants' feelings, understandings, experiences, and thoughts (Patton, 2002). For the participant, the photographs typically have significance and the interview allows for a discussion of their own interpretation (Blinn and Harrist, 1991).

Photo elicitation can either use photographs produced by the researcher or the participant. This study utilized photographs taken by the participants and therefore likens the data collection method to 'photovoice'. Photovoice has been deemed to be a powerful method for documenting social and environmental change, triangulating research data, illuminating novel ecological interactions, and deepening our understanding of resource management, development and adaption to change at the local-level (Bennett and Dearden, 2013). By asking community members to take their own photographs, I aimed to gain a full understanding of the social and environmental changes occurring on the island and a glimpse of ongoing conservation efforts that occurred in participants' everyday lives. I also hoped that using images taken by participants themselves would allow for more feelings of connection and ownership in relation to the research project and its outcomes (Richard and Lahman, 2014).

All participants with whom I conducted semi-structured interviews were asked if they were interested in further participating in the photo elicitation portion of the study. Willing participants were asked to use their own camera to capture images of some or all the following:

- a) Things you consider to be environmental issues
- b) Aspects of the environment or places around Koh Lipe that you personally value
- c) Places or things that inspire you to conserve the environment
- d) Conservation activities that you have observed or participate in personally

An information sheet describing the purpose of the study was provided in English and Thai and I worked with a translator to describe the meaning of each prompt. There was no minimum or maximum photo number requirement and I did not insist each prompt was answered. I asked each

participant to contact me once they had completed the assigned task, and if they did not, I followed up two weeks after distributing the information. At the participant's earliest convenience, a semi-structured interview was carried out based on five pictures selected by the participant. The semi-structured interview guide for photo elicitation participants can be found in Appendix II. Out of thirty-two participants, six were interested in participating; however, out of these six, two participants failed to submit photos.

2.9: Data Validity and Dissemination

Validity describes "how accurately the account represents participants' realities of the social phenomena and is credible to them," (Creswell and Miller, 2000; p. 124; Schwandt, 1997). Further, validity determines whether the research project has successfully collected the information it initially intended to collect (Joppe, 2000). To establish validity of this study, I utilized strategies that fall under the lens of the researcher and the participant.

Through the lens of the researcher, I aimed to achieve credibility by using triangulation. Triangulation allowed me to examine the data from different sources, methods, and researchers and compare the findings to ensure they revealed consistent patterns (Creswell, 2003; O'Connor and Gibson, 2003). In this study, triangulation was achieved through the application of three different data collection methods as described above: participatory observation, photo elicitation, and semi-structured interviews. Using multiple methods for data collection allowed me to cross check the consistency of information learned over the course of the study. Cross-checking information largely followed methods outlined by Patton (1999; p.1195); specifically, I made comparisons between interview and observational data, compared how people acted and expressed themselves in public with how they acted and expressed themselves in private, checked if people spoke or behaved consistently throughout the field study, and compared the perspectives of people

who may have different points of view – for example, I compared the perspectives of Chao Ley people with those of who recently moved to Koh Lipe.

I also aimed to establish the validity of the research findings by examining the results through the eyes of the participants. Through this lens, the participants themselves could assess whether my findings represented them accurately. In this case, I used member checking by having ongoing, open communication with several key-informants. During these frequent, informal conversations, I was able to discuss my findings, clarify findings that were initially unclear, and further discuss findings that were unique.

Member checking also provided a means to disseminate major themes in the research data to the key informants. The dissemination meetings took place during one-on-one meetings and provided a final opportunity to validate the findings. Once this study is complete, I intend to distribute all findings to interested participants in the form of a webpage. The webpage will be distributed to individuals using the contact email address provided during semi-structured interviews and will be presented in both English and Thai.

Reliability refers to the consistency or quality of the research (O'Connor and Gibson, 2003). Reliability can be achieved by ensuring a consistent effort and commitment to the data collection, transcription and analysis (O'Connor and Gibson, 2003). In order to ensure the study is reliable and repeatable, I maintained a consistent method, effort and commitment to all data collection, interview transcriptions and data analysis.

2.10 Data Analysis

A large volume of data was collected during the field work period of this study. To effectively manage and organize the data, I began to document and transcribe participant observation, photo elicitation interviews and semi-structured interviews in the field. Transcription

of recorded interviews was completed once I returned to Canada. The data was coded using NVivo after documentation and transcription. Data analysis was done by searching for themes and patterns (Creswell, 2007). Steps for analysing data followed the guide published by O'Connor and Gibson (2003):

1. Organization of data: refer to interview guide, prioritize information related to research questions, separate interview responses based on research topics, group similar responses
2. Find and organize ideas and concepts: identify themes, recurring ideas or words, look for unexpected results, organize recurring ideas or words into codes or categories
3. Build over-arching themes in the data: group codes or categories together under themes that give the data deeper meaning
4. Make sure data is reliable and valid: check with participants that the data is accurate and true throughout research, triangulate data, be consistent with methods, transcription and analysis
5. Find possible explanations of findings: relate findings to literature, locate surprises, refer to field notes and observations, get help from community members or experts on topic, determine implications of findings

The data analysis closely followed this approach. Data organization was made easier by the fact that I designed the interview guide around the research objectives. I could easily separate and prioritize interview responses based on the research objectives and group responses that were similar. Once the data was organized, I looked for recurring themes, ideas, and words and placed them into different categories. Based on my literature review, there are several themes I expected to find in my results and used as parent themes. For example, top-down resource management,

community-based or co-management-style resource management. Some themes that emerged were completely unexpected and I had to consult the literature to better understand them. For example, I did not expect or previously research themes that arose related to displacement, corruption, or conflict. As outlined above, to ensure the research findings were valid and reliable, I was careful to maintain consistency with the research methods and utilised several procedures to assess accuracy. Consultation with the literature, colleagues, my superiors, and several key informants assisted me in finding possible implications of the research findings.

Chapter 3

Literature Review: Local Involvement in Marine Conservation

3.1: Introduction

Chapter 3 will review the literature concerning stressors on the Andaman Coast of Thailand, multilevel commons, marine protected areas, and linking biodiversity to local livelihoods.

3.2: Commons

The Andaman Coast of Thailand, home to some of the most productive ecosystems in the world, is currently experiencing deterioration and reduced productivity due to pollution, destructive fishing practices, coastal development, and overharvesting (Bennett *et al.*, 2014b; Project IMPAACT, 2015). These local and regional stressors add to existing global stressors to which this region is particularly susceptible, including those related to climate change such as ocean temperature rise, increased frequency of extreme weather events, and ocean acidification (Bennett *et al.*, 2014b). Combined, these stressors can have a negative impact on local infrastructure, increase coastal erosion, deteriorate marine and coastal ecosystems, and decrease overall biodiversity, in turn creating serious consequences for local communities in the region who rely on these important natural resources for their livelihoods (Bennett *et al.*, 2014a; 2014b; Marshall *et al.*, 2010).

The negative impacts that global, regional, and local stressors have on the biodiversity on the Andaman Coast of Thailand can be described using the theory of the ‘tragedy of the commons’ (Hardin, 1968). The example used by Hardin (1968) to visualize this concept is a pasture, free for use by everyone. The tragedy occurs when herdsmen attempt to maximize his own gain by adding cattle to the pasture that is already at its carrying capacity. Though the addition of the cattle increases the benefit for the individual herdsman, the whole pasture is subject to overgrazing and

as a result, the biomass of all cattle in the pasture decreases, reducing productivity for every single herdsman. This example is a good way to understand other commons, such as biodiversity. As Berkes (2015) writes,

Biodiversity can be treated as a multilevel commons problem.
Biodiversity is a global commons, important for humanity as a whole.
It is a regional commons, important for ecotourism and other benefits.
It is also a local commons that produces ecosystem services for human well-being.

(p. 190)

On the Andaman coast of Thailand, the freedom for many people to access the biodiversity has resulted in reduced productivity of the whole system, a form of tragedy of the commons (Feeny *et al.*, 1990).

3.3: Marine Protected Areas

Over the past several decades, global views on biodiversity conservation have evolved significantly (Berkes, 2007). Prior to the 19th century, sacred sites or royal grounds provided protection for natural areas in ways similar to conservation in protected parks today (Berkes, 2007). It was not until the late 19th century that policy makers and economists, consistent with Hardin's argument that "freedom in a commons brings ruin to all" (Hardin, 1968, p. 1244), began identifying a problem with free access to resources and believed privatization or government ownership would be more suitable alternatives (Berkes, 2007; Dietz *et al.*, 2002). As a result, property and management rights for natural resources such as forests, pastures, in shore fisheries all over the world, especially in developing countries, were transferred to the state in order to create nationally protected areas specifically for non-consumptive purposes (Arnold and Campbell, 1986; Dietz *et al.*, 2002). The assumption that wildlife resources were owned by the state has become a dominant theme in conservation policies around the world (Berkes, 2007).

In order to prevent any further damage and preserve the remaining important ecosystems along the Andaman Coast in Thailand, several Marine Protected Areas (MPAs) have been established in the area by the Thailand government's Department of National Parks, Wildlife and Plant Conservation (DNP) (Bennett and Dearden, 2014). The International Union for Conservation of Nature (IUCN) defines protected areas as "a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values," (Day et al., 2012, p. 12). Included among the MPAs in this region are 16 existing and 1 proposed National Marine Parks (NMPs), totaling an area of 483,990 ha, that are controlled by the DNP of Thailand (Bennett and Dearden, 2014; BOBLME, 2011; p. 148).

Despite the positive intention of marine protected areas and national parks to preserve biodiversity, research has shown that exclusionary conservation practices can have negative consequences (Dietz et al., 2002). For instance, dismissing existing indigenous institutions and making locally-led conservation efforts illegal can generate conflict between rural and indigenous communities and their governments (Berkes, 2007; Dietz et al., 2002; Western and Wright, 1994). For instance, rural and indigenous groups can take issue with the state for assuming ownership over the local resources upon which they depend and implementing rules that are strict, based on scientific recommendations and often interfere with their livelihood activities (Berkes, 2007; Western and Wright, 1994). Further, many governments, especially in developing regions, do not have the capacity to monitor resource boundaries or enforce harvesting limitations in the areas for which they took ownership (Dietz et al., 2002).

The MPAs on the Andaman coast of Thailand have been created in a region where over two million people are living, many who are dependent on the local marine resources for their

livelihoods related to small-scale fishing or tourism operations (Bennett and Dearden, 2014; BOBLME, 2011). Creating MPAs and therefore prohibiting fishing and other traditional livelihood activities, fails to identify human well-being and invites local people to engage in “encroachment and poaching,” (Berkes, 2015; p. 176). History shows that illegal activities only lead to further ecosystem deterioration, increased conflict between community members and national park officials, and continued belief that communities have no place in conservation (Berkes, 2015). These problems become exacerbated with population growth and therefore an increased demand for resources (Roe *et al.*, 2013).

Critiques of Hardin’s theory of the ‘tragedy of the commons’ sheds light on how derived policies, such as marine protected areas, can fail in the real world. Critics argue that Hardin’s theory makes an unsubstantiated assumption that humans will always behave in an individualistic manner and only act in the interests of other people, or for the sake of an ecosystem, when they are guided by government regulations to do so (McCay and Acheson, 1987; Ostrom, 1990; Davis *et al.*, 2006). Though the theory does acknowledge the role of individual motivations and actions in a ‘commons’, it is inadequate in that it fails to recognise interactions among individuals and the fact that individual choices and behaviour are governed by social and cultural circumstances unique to each situation (McCay, 2002; Peters, 1987). Furthermore, McCay (2002) points out that it is culture that determines how commons problems are socially constructed and these constructions determine whether local institutions, including rules, governance systems, changed behaviour patterns and new norms and values, will emerge to manage the commons resource. According to McCay (2002), whether these institutions emerge in a commons situation depend on three factors; first, whether the people affected perceive there to be a problem; second, whether the people affected can link the problem to their own actions and; third, whether people affected

perceive the problem as something they have the ability to solve and whether they can agree upon a change or new regulation that would help solve the problem. McCay (2002) also highlighted that external organizations can play a role in whether these institutions emerge.

3.4: Social-ecological systems lens

Until recently, the worlds of natural science and social science were considered separately and had very little interaction (Berkes *et al.*, 2003). Linking ecological biodiversity with humans and their activities is a result of a relatively new area of research called Social-Ecological Systems (SES). Through the SES lens, the environment is envisioned as a large, open system where both social and ecological components exist as subsystems and their related processes interact in a two-way feedback relationship (Berkes, 2011; Virapongse *et al.*, 2016). Interactions between the various processes of social and ecological subsystems can be small, such as a community-based beach cleanup organization, or large, such as a fleet of commercial fishing boats in the Andaman Sea (Berkes *et al.*, 2016). Interactions between processes are influenced by the economic and political environment, and broad scale biogeochemical conditions (Chapin *et al.*, 2009). Essentially, all human activities impact the environment in some way, and environmental contexts strongly affect human decisions and behaviours (Redman *et al.*, 2004). The recognition that humans are a component of all ecosystems is especially critical in this current age, where human activities play a very active role in natural environments at both global and local levels (Berkes, 2015; Redman *et al.*, 2004).

3.5: Community-Based Conservation

Considering the “multilevel nature of biodiversity” (Berkes, 2015; p. 190), an alternative solution for effective biodiversity conservation, instead of nationally protected areas, requires the involvement of all users of this multilevel commons: global, regional and local (Berkes, 2015). International and national-level standards and policies for biodiversity conservation are important

to set guidelines; however, local people and communities should play a significant role in the day-to-day operations and enforcement of rules in the protected areas (Berkes, 2015). In order to prevent illegal activities, conflict and further ecosystem deterioration, biodiversity conservation should be linked to better local livelihoods (Berkes, 2015). This can be achieved by associating biodiversity conservation with economic (although this may be counterproductive, more below), political, social, or cultural incentives (Berkes, 2015).

Though Thailand has historically held a centralised governance system, with most decisions being made in the nation's capital, Bangkok, the government has recognized the need for local level involvement in decision-making over the past several decades, and it has been written in the constitution since 1997 (Wittayapak and Dearden, 1999; Dearden et al., 2017). Despite this major step, various factors such as culture, history, status quo, and often a lack of capacity, have made the transition to increased local-level involvement in resource management very slow (Dearden et al., 2017).

Community-based conservation (CBC) is one proposed management style that aims to link biodiversity conservation to livelihoods while integrating people's traditional knowledge, local management institutions, and social rules or norms (Berkes, 2004). CBC, although something that has undoubtedly been practiced informally, around the world and throughout history, is a concept developed in response to the phenomenon of state-owned and exclusionary conservation methods (Berkes, 2007; Murphree, 2002). The approach, based on simultaneous development and sustainable, community-level resource use and conservation, is centered on decision making by resource users themselves (Berkes, 2007; Murphree, 2002). Western and Wright (1994) define CBC as "natural resources or biodiversity protection by, for, and with the local community," (p. 7). These authors emphasize that the concept pertains to "the coexistence of people and nature ...

distinct from protectionism and the segregation of people and nature,” (Western and Wright, 1994; p.8). CBC allows for areas rich in biodiversity to be preserved by local people who rely on the resources either for cultural purposes, their livelihoods, or both (Robinson and Sasu, 2013; Phillips, 2003). It thereby creates an opportunity for people who are frequently marginalized to be empowered while actively participating in resource management (Gilmour and Fisher, 1991; Little, 1994; Kellert et al., 2000). CBC recognizes the importance of social and economic incentives, and that in order for communities to both effectively conserve biodiversity and develop sustainably; they must control and receive benefits directly from the utilisation of local natural resources (Robinson and Sasu, 2013).

There are examples of successful CBC programs from around the world, including Thailand. As reported by Dearden et al. (2017), a small island community called Koh Pitak in the Gulf of Thailand initiated a very successful community-based tourism initiative in the 1990's. The community took action after becoming in debt trying to extract fish from a system already exhausted by local and international fishers. With no help from the Thailand government, despite their requests, the community realized they needed to take resource management into their own hands. The leader of Koh Pitak organized several community meetings and as a result, several groups were created to develop new initiatives. Included in these groups were a tourism group and a giant clam conservation group, both which support the community of Koh Pitak to this day. The success of this community-based tourism and conservation initiatives can be attributed to a number of different factors including; a determined and encouraging leader with a democratic and transparent governing style, strong community social capital and group cooperation, equal distribution of equity from tourism initiatives, the opportunity for community members to learn from other successful CBC initiatives in Thailand, formal government recognition for the locally-

led efforts, the inherently welcoming nature of the Koh Pitak culture, and the support from external agencies including NGOs and national agencies (Dearden et al., 2017).

Though the idea of CBC appears as a win-win alternative to top-down management, and has become very popular in recent decades, the results of other attempted CBC experiments have not been as successful as that of Koh Pitak and in fact, many have fallen short of expectations (Barrett et al., 2001; Kellert et al., 2000). Additionally, studies on existing ‘successful’ CBC schemes rarely utilize empirical data to demonstrate indications of ecological or social benefit (Barrett et al., 2001).

The CBC approach fails to acknowledge several important factors, which make it difficult to implement in reality (Barrett et al., 2001; Kellert et al., 2000). For example, advocates tend to oversimplify the term ‘community,’ assuming that they are homogeneous groups of people (Barrett et al., 2001; Kellert et al., 2000; Robinson and Sasu, 2013). In reality, communities are diverse and the individuals inhabiting them may be divided by gender, age group, social status, and levels of political or economic power (Robinson and Sasu, 2013; Seixas and Davy, 2008). Additionally, these individuals likely do not share the same values, interests, social norms, aspirations, or levels of resource extraction (Barrett et al., 2001; Leach et al., 1999; Robinson and Sasu, 2013; Seixas and Davy, 2008). Therefore, in a social setting where economic and social situations are quite variable, it can be difficult to create the community-level institutions required to facilitate biodiversity conservation (Barrett et al., 2001; Berkes, 2004).

Further, the concept of CBC assumes that every community has the capacity to manage their own natural resources (Barrett et al., 2001). Local institutions that have the capacity to manage natural resources have clear goals for biodiversity conservation and are strong enough to maintain these goals (Barrett et al., 2001). For instance, in the face of change or temptation to overexploit

resources, these institutions must be able to uphold their biodiversity goals (Barrett et al., 2001). The same dedication to conservation must be demonstrated should outsiders come in and try to overexploit resources, even if they present political or economic incentives (Barrett et al., 2001). Maintaining conservation goals also requires enforcement of rules and restrictions at a local and national level (Barrett et al., 2001). Should corruption or inefficiency within institutions at any level be a factor, it would greatly hinder conservation goals (Barrett et al., 2001). Historically, neither local nor national governments in the tropics have demonstrated such clear goals of biodiversity conservation (Barrett et al., 2001). In fact, governments in the tropics are typically weak with related management institutions frequently “overwhelmed, eroded, or nonexistent at the community level,” (Barrett et al., 2001; p. 499).

Finally, the fact that the success of many CBC programs are based on incentives that community members will gain from sustainable resource use is often not enough (Brandon and Wells, 1992; Barrett et al., 2001). As previously mentioned, communities are diverse and some individuals may aspire to gain more than the targeted benefits as planned by local institutions. An example, as reported by Barrett et al. (2001), is fixed income levels. Some community members may not settle for the targeted or fixed income and may wish to pursue additional opportunities to increase their own income. Research has shown that in the absence of authority or enforcement, seeking other opportunities to increase their income will only increase the rate of resource extraction (Agrawal et al., 1998; Barrett and Arcese, 1998). Further, monetary incentives may not be sufficient for those living in the developing world; instead, incentives such as empowerment and equity may be equally, if not more important (Berkes, 2004).

These major critiques of CBC demonstrate that it can be challenging to implement successfully and not suitable for every community. In the aforementioned example of Koh Pitak, Dearden et

al. (2017) outlined that the community's capacity was able to grow as a result of unique circumstances including strong local leadership, the adoption of common goals and aspirations, incentives based on equity and empowerment, and the development of horizontal (through other communities and NGOs) and vertical partnerships (through the government).

3.6: Adaptive Co-management

As with top-down resource management, community-based conservation and resource management can fail to acknowledge the complexity of resource management and ignore the importance of multilevel institutional linkages (Berkes, 2015; Dietz et al., 2002). Co-management is one way to address the complexity of resource management and incorporate multilevel institutional linkages (Berkes, 2002). It is defined as a partnership and sharing of power between government and local people in regard to a particular area, resource or set of resources (Berkes, 2004; Berkes, 2015). True co-management has at least one strong vertical linkage between the government and local-level resource users and a predetermined and formal arrangement for which the power and responsibility are shared (Berkes, 2015; Berkes, 2009; Pinkerton, 1989). While early definitions have focused on one vertical linkage between government and local resource users, the definition of co-management has since evolved with the recognition that in reality, co-management involves a network of multiple linkages and social relationships spanning both horizontal and vertical institutional levels (Berkes, 2015; Carlsson and Berkes, 2005).

Co-management functions as an evolutionary process that requires ongoing learning and trust-building for all parties involved (Berkes, 2004). For this reason, the term adaptive co-management is frequently used, creating a unique approach by combining the multi-level institutional linkages of co-management with the ongoing and dynamic learning processes involved in adaptive management (Berkes, 2004). Adaptive co-management can therefore be

identified as a structure where the responsibility of resource management is shared among stakeholders and trial, error and feedback determine how to proceed (Berkes, 2004; Folke et al., 2002). It is unique in that it uses collaboration to address social and ecological uncertainties in governance and many types and sources of knowledge and ongoing learning to solve problems (Armitage et al., 2009).

With networks of linkages and social relationships across institutional levels forming the basis of co-management, its success largely depends on the management of these relationships (Natcher et al., 2005; Berkes, 2015; Olssen, Folke and Berkes, 2004). Five aspects related to relationship management have been identified in the literature to be important indicators of co-management success (Berkes, 2009). First is effective power-sharing; arrangements to recognize resource users in management should be made formal and legitimate (Kruse et al., 1998; Berkes, 2009). Additionally, improving local level institutions, capacity, and knowledge sharing should be incorporated in order to ensure equity and power imbalances (Berkes, 2009). Second, institution building; deliberate effort to build on the existing strengths of local institutions, and creating new institutions in the absence of functioning or relevant ones would help create a policy environment more favorable for functional co-management (Ostrom, 2005; Berkes, 2009). Third, building social capital; by increasing trust, maintaining reciprocity, establishing common rules, norms and sanctions, increasing connectedness, and expanding on networks and groups between partners of horizontal and vertical linkages, the cost of working together becomes lower, and co-operation becomes easier (Singleton, 1998; Pretty and Ward, 2001; Berkes, 2009). Fourth, recognizing co-management as a process; after establishing the formal and legitimate power-sharing arrangement, the subsequent building of local institutions, capacity, trust, and social capital, cannot occur instantaneously (Pinkerton, 1992; Berkes, 2009). These aspects and how they unfold are what

determine whether or not a particular situation can be considered co-management. In the words of Berkes (2009, p. 1694), “co-management is path-dependent.” Fifth and finally, viewing co-management as a platform for solving problems; instead of focusing on co-management as a formal structure, it is important to understand it as an arrangement where parties involved collaboratively solve problems, taking each experience as a lesson and applying it in the future (Olsson et al., 2004; Berkes, 2009).

To expand on the aforementioned five components of co-management, additional factors have been recognized in the literature as critical for building functional co-management arrangements that can facilitate the transition to adaptive co-management: knowledge production, bridging organizations, leadership, and social learning (Berkes, 2009). Social-ecological systems are complex and resource managers require a lot of information about them to manage natural resources effectively (Berkes et al., 2003). Information about ecosystems and how they work, resource abundances, as well as previous and current trends is dispersed across all levels of organization (Berkes, 2009). For example, at the local level, there exists knowledge of past and current state of resources as well as livelihood needs, whereas at the state level, there are tools and resources that allow knowledge generation from a broader standpoint (such as scientific databases) (Berkes, 2009). Combining knowledge and capabilities from all levels not only allows for location-specific management strategies through effective monitoring of resource availability, appropriately allocating resources and responding to ecosystem feedback from all levels, it also builds trust, social capital, and more effective power sharing relationships between local people and the state (Berkes, 2009; Arnold and Fernandez-Gimenez, 2007).

Despite the clear advantages of combining knowledge from all levels, it is often made difficult by the fact that, in general, scientists and government lack trust in local knowledge; local

knowledge is difficult to communicate, and the two knowledge types stem from different worldviews and have different origins, rules and assumptions (Berkes, 2008). Linking scientific and local knowledge can be made easier with help from bridging organizations (Folke et al., 2005; Berkes, 2009). Such organizations bridge local-level individuals and communities to other levels of organization by creating “an arena for knowledge co-production, trust building, sense making, learning, vertical and horizontal collaboration, and conflict resolution,” (Berkes, 2009; p. 1695). Bridging organizations can bring together stakeholder groups with varying interests and objectives, and provide the leadership to discuss and create common goals and targets (Berkes, 2009). Studies on existing co-management programs show that strong leadership is critical for success; in fact, bridging organizations without strong leadership have been observed to fail in the past (Berkes, 2009; Olsson et al., 2007; Beem, 2007).

Therefore, bridging organizations and leadership are key to bringing local and government level institutions together, facilitating the co-production of knowledge, and sharing information and resources (Berkes, 2009). Studies show that, once successful, bridging organizations and the associated multi-level partnerships often shift beyond co-management and perform other tasks such as solving conflicts, building trust, enhancing livelihoods and creating common goals (Berkes, 2009; Wilson et al., 2006).

Another task that bridging organizations facilitate is social learning. Schusler et al. (2003) define social learning as, “learning that occurs when people engage one another, sharing diverse perspectives and experiences to develop a common framework of understanding and basis for joint action,” (p. 311). Further, Armitage et al. (2009) define social learning as “the collaborative and mutual development and sharing of knowledge by multiple stakeholders (both people and organizations) through learning-by-doing,” (p. 96). Thus, social learning describes a process where

problems are solved through the sharing of knowledge, experiences and ideas from multiple stakeholders (Berkes, 2015). The knowledge production and trial, error and feedback component has a very important role in the transition from co-management to adaptive co-management (Berkes, 2015).

There are many case studies in the literature focusing on the application of co-management in resource management, including coral reef resources. For example, Dirhamsya (2013) documented how both community-based conservation and co-management approaches were utilized for coral reef management in the Raja Ampat Islands of Indonesia. Though the sea surrounding the Raja Ampat islands has such high biodiversity and diverse marine ecosystems that it is considered a “global priority for marine protection” (Dirhamsya, 2013; p. 65), the local people living in this region are among the poorest people in the country and the natural resources are subject to overfishing, destructive fishing practices, and turtle poaching. In order to increase the capacity of local-level institutions for effective resource management at the community level, the Coral Reef Rehabilitation and Management Program (COREMAP) was launched in 1998. COREMAP is a 15-year project that has been implemented in 39 different locations of Indonesia. It is funded by the Indonesian government and several external donors including the World Bank and therefore serves as a bridging organization. In each community, COREMAP establishes a leader to facilitate community participation in coral reef management as well as local-level institutions to “strengthen and empower the communities in managing their coral reefs,” (Dirhamsya, 2013; p. 68). A committee specifically for coral reef management is created in order to organize all local-level activities related to coral reef management and conservation. Each community assisted by COREMAP must work together to select an appropriate area to designate as a local marine protected area where fishing is prohibited and local monitoring can occur. Each coral reef

management committee must also develop a management plan for the local coral reefs that details how the community will address issues related to pollution, overfishing and destructive fishing practices, and illegal trawling. COREMAP villages are also provided with grants to pay for social infrastructure and foster local-level development in order to diversify income sources and therefore reduce fishing pressure on the coral reefs.

Dirhamsya (2013) highlighted that COREMAP's success, indicated by increases in live coral cover, total average fish catch, and average village income, was contingent on three factors: first, support from government, NGOs and academic institutions in order to help facilitate discussion and resolve problems; second, community participation in planning of implementation of coral reef conservation activities, which itself required social intervention in the form of education, development and community awareness to achieve; and third, a sustainable, local-level coral reef management committee, which required human capacity and long-term financial stability. This example illustrated how successful a co-management conservation project largely depended on the management of relationships among players involved. COREMAP initiatives began by effectively sharing power with local users of coral reefs. They focused on building local institutions, electing leaders and forming official groups for reef management while also building trust between COREMAP organizers and local people. They also utilized a bridging organization and a strong leader to facilitate discussion, knowledge production and problem solving.

3.7: Motivations and Drivers

Understanding the factors that incite local-level engagement in conservation activities can help to increase the likelihood of success of community- or co-management-based conservation approaches (Ruiz-Mallen et al., 2015; Souto et al., 2014). Ruiz-Mallen et al. (2015) point out that both internal and external factors contribute to involvement in conservation and identify them as

motivations and drivers, respectively. *Motivations* are targets that exist within an individual or group that guide their behaviour and determine their level of engagement in conservation (Ruiz-Mallen et al., 2015). Alternatively, *drivers* are conditions and multi-level institutional processes that incite people to engage in conservation using incentives, pressure, and enabling conditions (Ruiz-Mallen et al., 2015).

Motivations for engagement in conservation activities are very much related to values. There are three types of values: intrinsic, instrumental, and relational (Chan *et al.*, 2016). *Intrinsic values* are those centered on the idea that nature has inherent value independent of humans (Chan *et al.*, 2016). *Instrumental values* refer to the value of nature to people (Chan *et al.*, 2016). For example, a specific part of nature may be valuable to a group of people because it is aesthetically beautiful or it provides clean drinking water. *Relational values* are based on “all manner of relationships between people and nature, including relationships that are between people but involve nature,” (Chan *et al.*, 2016; p. 1462). For example, stewardship is a responsibility that people carry based on their own relationship with a particular part of nature (Chan *et al.*, 2016). Furthermore, management of a particular part of nature or resource may foster or reinforce relationships related to cultural identity, sustenance, identity, and social ties (Chan *et al.*, 2016). Values are often overlooked but very important factor in conservation because values, along with identities and power, shape local institutions (Robinson and Sasu, 2013).

Drivers of conservation activities in a community can have various origins (Robinson and Sasu, 2013; Seixas and Davy, 2008). For example, contextual conditions, such as environmental degradation or natural disasters can trigger groups of people to engage in conservation (Seixas and Davy, 2008). Drivers can also exist in the form of financial returns or policy tools (Ruiz-mallén et al., 2015; Seixas and Davy, 2008). For example, communities may be more proactive in

biodiversity conservation if they are receiving economic returns from maintaining healthy local ecosystems or if the state provides economic incentives for developing or using natural resources sustainably (Ruiz-Mallén et al., 2015; Seixas and Davy, 2008).

Both motivations and drivers determine the level of involvement of local people in conservation activities (Souto et al., 2014). A study by Souto et al (2014) illustrated that conservation projects initiated solely by drivers can be difficult to maintain if the local community develops a dependence on external input, such as economic incentives, the global market, or technical support. In order to avoid any related dependency and ensure long-term sustainability, Souto et al. (2014) suggest that project goals are expanded so that outcomes extend beyond a specific environmental conservation target to also include outcomes catered specifically to the values held by the local people. For example, capacity building and education development are additional outcomes that could possibly cater to the values of a group of local people (Souto et al., 2014). Planning ahead to produce a variety of outcomes creates a more positive attitude towards conservation (Souto et al., 2014). If the origin of motivation for a conservation project comes from within the local community there is a greater chance that both conservation and sustainable development goals can be achieved (Souto et al., 2014). Having internal motivation to protect a specific area, species, or ecosystem means that it is already ingrained in culture and traditions, important for the overall wellbeing of that group and community participation in conservation activities will be high (Souto et al., 2014).

Therefore, the nature and level of engagement of local people in conservation activities depends on different motivations and drivers, that when combined can have synergistic effects (Ruiz-Mallén *et al.*, 2015). When approaching conservation through community-based conservation or co-management, an understanding of the factors that motivate local people to

engage in conservation activities helps to develop successful resource conservation strategies and more sustainable, cost-effective and positive outcomes (Ruiz-Mallen *et al.*, 2015; Souto *et al.*, 2014).

3.6: Ecotourism

Ecotourism is one example of a local market opportunity that can act as both a driver and motivation for conservation in a community. Ecotourism refers to tourism that focuses on experiencing natural regions, building environmental consciousness and increasing the appeal to conserve the environment (Bjork, 2000; Chiu *et al.*, 2014). It aims to prevent the exploitation of resources, educate the tourist on the natural and social culture of the area, and protect the natural environment by generating revenue, providing environmental education and involving the local people (Ross and Wall, 1999; Sirakaya *et al.*, 1999). Ecotourism can create an economic incentive for local people to preserve biodiversity and prevent activities that exploit local resources (Langholz, 1999; Stronza and Gordillo, 2008). The non-economic benefits of ecotourism can also motivate communities to conserve as it creates opportunities for local people to learn new skills, expand their social circles, and gain new experiences, ultimately leading to community empowerment (Scheyvens, 1999; Stronza and Gordillo, 2008).

SCUBA (Self-contained Underwater Breathing Apparatus) diving, henceforth referred to as diving, is a popular tourist activity that attracts millions of people to coastal regions around the world (Wongthong and Harvey, 2014). With coral reefs being a major attraction for divers, the diving industry can provide an incentive for local communities to prevent overexploitation and actively conserve coral reef ecosystems, thus providing an excellent activity to support an ecotourism initiative. Despite this possibility, rapid and uncontrolled development in an area can result in high environmental and socio-economic costs that may actually deteriorate coral reefs

(Dearden *et al.*, 2007; Wongthong and Harvey, 2014). Furthermore, studies from around the world have shown that intensive recreational diving negatively impacts coral reefs (Burke *et al.*, 2011; Dearden *et al.*, 2007; Harriott *et al.*, 1997). Sources of damage to coral reefs directly related to diving (and snorkelling) activities include the use of anchors, run-off from dive boats such as oil, gas, garbage or sewage, as well as kicking, stomping or standing on corals (Dearden *et al.*, 2007; Harriott *et al.*, 1997). Therefore, the degradation of coral reefs as a result of intense dive tourism and any associated development could affect the sustainability of the industry and other local tourism operations in the area (Marshall and Schuttenberg, 2006; Wongthong and Harvey, 2014).

The degree to which divers or dive industries impact specific coral reef ecosystems depend on many factors including the experience level of divers, the age of the local dive industry, and the management regulations being enforced (Augustine *et al.*, 2016). The use of the Wildlife Tourism Model (WTM) incorporates all of these topics to examine the sustainability of a tourism area and the possibility of using incentive-driven conservation (Augustine *et al.*, 2016). The WTM, initially proposed in 1990 by Duffus and Dearden, combines several theories to illustrate that as a natural area becomes increasingly popular for tourists, two things occur; first, it loses conservation value due to increased ecological impacts; and second, as a result, the number of recreational wildlife specialists who visit the area declines (Butler, 1980; Dearden *et al.*, 2006; Augustine *et al.*, 2016). With recreational wildlife specialists typically spending more money, setting a high reputation and set of standards for diving locations, and generally having less of an impact on the environment, their replacement with recreational wildlife generalists in a tourism area only reduces the economic returns and increases the environmental impact of the diving industry over time (Dearden *et al.*, 2006). The WTM further suggests that active management is essential to ensure growing tourism industries do not impact the environmental, social and managerial conditions more than desired

(Duffus and Dearden, 1990). The model proposes that establishing limits of acceptable change (LAC) can help resource managers to identify the level of protection required for a specific area (Augustine et al., 2016). LACs can create management objectives that are maintained through evaluation, indicators, standards and intervention when necessary (Augustine et al., 2016).

In a 2016 study by Augustine et al., a Wildlife Tourism Model (WTM) was used to evaluate how changing reef conditions and diving clientele have affected the sustainability of the coral reef ecosystem on the Andaman coast of Thailand. The study used diver surveys to determine the specialization level of divers in the year 2000 and again in 2012. The results showed a significant shift in expertise over time with even distribution of low, medium and high specialization divers in 2000 to primarily low to medium specialization divers in 2012. This shift in diver specialization indicates that the Andaman Coast is following the WTM in that the diver specialization of visitors is decreasing as the area becomes more popular for tourists with different interests and the quality of the environment declines. Consequently, both the conservation potential and possibility of using diving as an incentive for conservation along the Andaman coast are decreasing (Augustine et al., 2016).

In order to maintain a diving industry and the potential for diving-related incentive-based conservation in areas with coral reef ecosystems, including the Andaman coast of Thailand, management of coral reef ecosystems in the region should consider the characteristics of divers who visit (Augustine et al., 2016). To do so, managers could utilize LACs to set ecological and social conditions desired for specific areas (Augustine et al., 2016). For example, if managers wish to see a diversity of specialization divers in the region, some areas could have LACs specifically catered to high specialization divers and some to low or medium specialization divers (Augustine et al., 2016). Furthermore, diver education could be significantly improved (Dearden et al., 2007).

Increasing the availability of training programs that aim to boost wildlife generalists to wildlife specialists would increase the conservation ethic of divers and their overall desire to experience more species-rich ecosystems (Augustine et al., 2016). The conservation ethic of visiting divers could also be improved by ensuring the goal is adopted by all who involved in the dive industry. For example, dive instructors, dive masters, boat operators, diving resort owners and staff, and marine conservation organizations, could work together to educate divers and increase their awareness of their potential impact on coral reefs (Dearden et al., 2007). Diver education programmes, including volunteer ecotourism activities, have been shown to be an effective tool for increasing diver satisfaction and preventing damage to important coral reef ecosystems (Barker and Roberts, 2004; Dearden et al., 2007). Increasing national marine park user fees and instilling operator certification systems are also good ways to raise the standards of both divers and diving institutions (Augustine et al., 2016).

An important note is that the above ideas also apply to the management of coral reef areas utilized for snorkeling tours: visitor characteristics should be considered along with the ecological characteristics of a protected area (Roman et al., 2007).

3.7: Summary

In summary, many global and local stressors are affecting the health and productivity of marine ecosystems on the Andaman Coast of Thailand. With stressors originating from the global, regional and local level, this can be considered a multilevel commons problem. Thailand's Department of National Parks have responded to this commons problem by creating nationally protected areas along the Andaman Coast; however, this comes at a cost for many local people living in this region who rely on the marine resources for their livelihoods. Research shows that

prohibiting traditional livelihood activities may encourage illegal activities and create conflict among user groups, furthering ecosystem deterioration.

An approach to conservation that may have greater success is to involve all users of this multilevel commons, including the local people and communities. Associating biodiversity conservation with local livelihoods and looking at conservation through the SES lens links the human system with the natural system. CBC is one method for integrating local knowledge, social norms and rules and local management institutions and facilitating more effective conservation; however, it may not be sufficient as it can fail to acknowledge multi-level institutional linkages that are important for building trust, effective relationships and effective problem solving, factors necessary for resource management.

Co-management is an alternative to community-based conservation that involves both horizontal and vertical institutional linkages. These linkages are important as the individuals and groups involved help to facilitate effective power sharing between government and local resource users, build local institutions, build trust among institutions, and create a platform for solving problems and generating knowledge. Strong leadership, social learning and bridging organizations are likely to improve the success of co-management and allow for the transition into adaptive co-management.

Knowledge and understanding of the motivations and drivers held by local people is important prior to the initiation of community-based or co-management approaches to conservation. Shaping the goals of a conservation project around motivations and drivers specific to each community would allow for increased interest, involvement and participation from local people, and thus a greater likelihood of achieving biodiversity conservation and sustainable development.

Ecotourism can act as a motivator and driver for conservation. Diving is a potential ecotourism activity and incentive for conservation; however, it can further deteriorate marine ecosystems without careful management. Careful management of coral reefs for the diving industry entails focusing on the characteristics of divers visiting the region. Setting LACs for various diver specializations, improving diver education, a community-wide adoption of conservation goals, increasing national park fees and instilling operator certification systems are all good methods for improving the sustainability of coral reef ecosystems, the diving industry and associated livelihoods.

Chapter 4

Koh Lipe: Past and Present

4.1: Introduction

This chapter will present findings relevant to the first objective of this research: understanding the social and environmental changes that have occurred on the island of Koh Lipe in recent decades.

This chapter describes the history of Chao Ley people in the Adang Archipelago, the introduction of Tarutao National park, newcomers to Koh Lipe, and social-ecological challenges that have arisen as a result of these changes. These findings are based on data collected from published literature, participant observation, semi-structured interviews, and photo elicitation.

4.2: Priority Social Changes 2016

4.2.1: Koh Lipe History and Chao Ley People



Figure 4.1: Homes in the Chao Ley villages are often painted to portray prominent community members or traditional activities



Figure 4.2: Chao Ley community members dance and sing around a miniature long tail boat at the annual Chao Ley festival

Historically, many groups have utilised the resources in the Adang Archipelago; however, a local group called the Urak Lawoi have resided in the area the longest and utilized the widest array of resources (Wongbusarakum, 2002). “Urak Lawoi”, a phrase that originates from the Malay language and means “sea people”, refers to sea-faring people such as nomads and fishermen (Wongbusarakum, 2002). Though the origin of the Urak Lawoi is disputed, it is generally accepted that the group of Urak Lawoi in Thailand originated from Malaysia (Wongbusarakum, 2002). In Thailand, many Urak Lawoi and native Thai people refer to the Urak Lawoi as “Chao Ley”, which translates to “people of the sea” in Thai (“The Chao Ley”, 2005; Wongbusarakum, 2002).

Though the Chao Ley have historically lived semi-nomadically on many islands along the Andaman Coast, the island of Koh Lanta is considered their original home (Wongbusarakum, 2002). A group of the Chao Ley population from Koh Lanta resettled in the Adang Archipelago in

1909 after encouragement from the provincial government of Satun (Wongbusarakum, 2002). At the time, the border between Malaysia and Thailand was being redefined and the Thailand government used the Chao Ley settlement to prove to the British Colonial Administrators that the Adang Archipelago was occupied and therefore territory of Thailand (Wongbusarakum, 2002).

Upon resettlement, the Chao Ley established several villages in the Adang Archipelago including those on Koh Adang, Koh Rawi, and Koh Lipe (Wongbusarakum, 2002). In continuing their traditional, semi-nomadic lifestyle, they also spent several months of the year camping on beaches on Koh Rawi, Koh Adang, and Koh Yang (“The Chao Ley”, 2005; Wongbusarakum, 2002).

Resettlement in the Adang Archipelago did not initially prevent the Chao Ley from maintaining a strong connection to the sea. The group used hook and line fishing and skilled freediving to harvest reef fish, sea cucumbers, sea turtles, lobsters and clams (“The Chao Ley”, 2005). Before the area became popular for tourists, it was common to see sea cucumbers drying on racks when walking through Chao Ley villages (Ead, pers. comm. 2016). In order to diversify their diets, the Chao Ley people planted rice, traded fish for other goods the mainland, and harvested fruit from the islands, such as papaya, mango and banana (Gilboa, 2000; “The Chao Ley”, 2005). There was a sense of community and security within the Chao Ley seaside villages as most things were shared and everyone was familiar with each other (“The Chao Ley”, 2005).

The Chao Ley’s connection with the sea was also present in their culture. Having an animist background, Chao Ley people “believed that every beach, sea and bay possessed a spirit that had to be respected,” (“The Chao Ley”, 2005; n.p). They also lived by the tides and lunar calendar and held a celebration with drumming for each full moon (“The Chao Ley”, 2005).

In 1974, the Thailand government created a national marine park called Tarutao National Park (“Tarutao National Park”, 2015). The park, located immediately northeast of Koh Lipe, covers an area of 1500 km², includes 50 small islands, and officially bans all fishing, trapping, farming and settlement within its boundaries (“Tarutao National Park”, 2015). Initially, the park policy was to remove people from the area for nature conservation purposes but considering the population size and history of Chao Ley people in the area, the policy was too difficult to instill (Gilboa, 2000; Wongbusarakum, 2002). The Chao Ley were permitted to stay in the area but expected to follow the rules and regulations of the park (Wongbusarakum, 2002). Not long after the creation of Tarutao National Park, most villages in the Adang Archipelago were pressured by the national park staff to relocate to Koh Lipe (Wongbusarakum, 2002).

Therefore, as a result of socio-political and ecological circumstances related to the Thailand border and nature conservation goals of Thailand, the Chao Ley people of the Adang Archipelago were forced to stop living their semi-nomadic lifestyle and become sedentary. Though this has resulted in tension between the Chao Ley population and Tarutao National Park staff, it is reduced by the toleration of subsistence farming and fishing in the park and the tourism industry, which decreases pressure on the fishing industry by diversifying livelihood opportunities for Chao Ley community members (Gilboa, 2000; Wongbusarakum, 2002; Som, pers. comm., 2016).

4.2.2: Newcomers, Changes in Way of Life, and Koh Lipe today

The introduction of Tarutao National Marine Park was not the only factor that influenced the social and ecological situation in the Adang Archipelago. The area has also been impacted by newcomers including tradesmen, commercial fishers, tourism developers and tourists (Wongbusarakum, 2002).

Tradesmen first arrived in the Adang Archipelago in the early 1950’s from the mainland of Thailand and Malaysia (Wongbusarakum, 2002). Originally, they acted as middlemen by

facilitating the trade of Chao Ley-harvested sea products for goods from the mainland of Thailand and Malaysia such as rice, clothes, and alcohol (Wongbusarakum, 2002). Over time, these tradesmen have integrated into the community on Koh Lipe and served as managers of multiple Chao Ley fishers (Wongbusarakum, 2002). Tradesmen have offered steady employment, security, and convenience to Chao Ley fishers who may not wish to communicate or negotiate with outsiders (Wongbusarakum, 2002). Though conflicts are rare, some view the relationship between Chao Ley fishers and tradesmen as negative because Chao Ley fishers often accumulate debt that is difficult to repay (Wongbusarakum, 2002). Informal conversation with fishers in this study indicated that tradesmen are still present in Koh Lipe, though many fishers prefer to work independently (Kiang, pers. comm., 2016)

Large commercial fishing boats began fishing in the Adang Archipelago in the 1950's and 1960's due to pressure from non-fishing industries in coastal zones, declining fish stocks in other areas of Thailand, and its reputation for have looser fishing laws (Wongbusarakum, 2002). The waters of the Adang Archipelago also offered a rich fishing ground and ideal trawling conditions (Wongbusarakum, 2002). Despite the presence of Tarutao National Marine Park, commercial fishing boats have only been observed to increase each year. Though commercial fishers rarely interact with the Chao Ley people of Koh Lipe, some Chao Ley fishers have expressed feelings of frustration towards them for extracting such a high quantity of fish using destructive fishing practices (Wongbusarakum, 2002).

Development for tourism in Koh Lipe and in the Adang Archipelago began at the same time Tarutao National Park was established in 1974. The area became known as attractive place to visit during the dry season, from December to April. The Royal Forestry Department of Thailand welcomed tourism as a means to simultaneously achieve conservation and economic

development (Wongbusarakum, 2002). They considered effective park management and protection to be an incentive for tourist visitation, and tourist visitation to be an incentive for effective park management and protection (Wongbusarakum, 2002). In 1984, the first tourist resort was built on Koh Lipe and tour agencies from the mainland of Thailand began offering boat transport to Koh Lipe. Tourists who visited Koh Lipe initially were national park staff family members, Thai people, and very few from Western Europe.

Over the past thirty years, the tourism industry on Koh Lipe has grown significantly. Infrastructure development for tourism occurred at a rapid rate. Research participants reported that the island has undergone major physical changes. Participants described that on the three beaches that compose the perimeter of the island, where there were once pristine, sandy beaches with untouched jungle and scattered Chao Ley homes, now sit a long line of tourist resorts. The jungle has been removed, a wetland has been filled in, and concrete roads have been constructed all over the island to connect the three beaches to the main “walking street,” where the majority of the island’s restaurants and souvenir shops can be found. In the dry season, the “walking street” is typically packed with tourists, motorbike taxis and personal motor vehicles (Figure 4.3). An inventory of local businesses on Koh Lipe from 2013 showed there to be 170 different establishments including but not limited to resorts, hotels, restaurants, bars, SCUBA diving companies, and general stores. The island has gained a lot of popularity with tourists and many people have speedboat companies have stepped up to accommodate transport from various ports in Thailand.

These various newcomers have affected the population dynamics and way of life for everyone on Koh Lipe. Aside from transitioning from semi-nomadic to sedentary, the Chao Ley community has undergone major changes. Though many Chao Ley people still operate fishing vessels, there

are also many who have careers in the tourism industry (“The Chao Ley”, 2005). Research participants explained that often, Chao Ley longtail boat captains will combine tourism and traditional fishing methods into their careers by guiding tours in the high season and fishing in the low season. Participants also explained that many Chao Ley women, who previously cared for children and assisted their husbands with fishing, drying and selling processes, are now employed in resorts on the island, often working in the kitchen or in housekeeping. During my field work, I encountered several Chao Ley women who deviated from this generalisation and either worked as a business owner, artist, or fisher. The Chao Ley women with whom I conducted interviews did not comment on the gender dynamics of Koh Lipe before or after the transition of Koh Lipe to a popular tourist destination.

As outlined previously, the population of Koh Lipe has grown to approximately 1400, with 800 known to be Chao Ley (Aladin, pers. comm., 2016). The remainder of Koh Lipe’s population originates from a variety of places including the mainland of Thailand, other parts of Southeast Asia, and Western countries in Europe and North America. Therefore, the community of Koh Lipe as a whole has also changed significantly since the introduction of Tarutao National Marine Park and tourism. As a participant observer, I was able to discern several small community groups within the entire community of Koh Lipe based on their personal background or choice of employment. For instance, there were sub-communities of Chao Ley people, fishermen, tour guides or boat captains, resident Thai business owners, expatriate business owners, and SCUBA divers. Some individuals were members of more than one sub-community. Family members of individuals in these sub-communities were grouped along with them.



Figure 4.3: A participant-submitted photo of Koh Lipe's Walking Street on a typical evening during the high season

4.3: Priority Environmental Changes 2016

As outlined in Chapter 3, marine ecosystems along the entire Andaman Coast of Thailand are experiencing deterioration and reduced productivity as a result of global and local stressors including climate change, pollution, destructive fishing practices, coastal development and overharvesting (Bennett *et al.*, 2014b; Project IMPAACT, 2015). For this research, community members were asked how the marine environment has changed over the past several decades. Research participants reported observing changes in their surrounding environment related to the aforementioned stressors every single day. In general, participants found there to be less coral surrounding the island, an increase in damaged and broken corals, fewer and smaller fish available to catch, and a huge increase in the amount of trash both on the shore and in the sea. The reported impacts to the marine environment could be divided into three categories, those relating to recreational tourism activities, fishing, and/or rapid development for tourism.

4.3.1: Recreational Tourism Activities

Recreational tourism activities on Koh Lipe include private and group snorkeling trips, SCUBA diving, and fishing trips, each requiring travel by a traditional longtail boat or speedboat. With more tourists arriving on Koh Lipe each year, there are greater opportunities for entrepreneurs to start offering these services. A concern held by many participants was the damage to coral caused by the increase in the number of boats. As each year passes on Koh Lipe, participants observe an increase in the number of boats lining the shores of Koh Lipe (Figure 4.4), higher boat traffic, more pollution from speedboat engines, improperly trained boat captains, and more foreigners visiting, who lack local knowledge of the reefs around Koh Lipe, and therefore incur more damage to corals than average. Combined, participants agree these factors are contributing to the decline of reefs in the area (Jode, pers. comm., 2016 and others). In the year preceding my field work, 7 new speedboat companies started tour operations on Koh Lipe (Pek, pers. comm., 2016). These tours operate in addition to countless speedboat tours that make day trips to Koh Lipe for snorkelling from the main pier in Pakbara (Pek, pers. comm., 2016). Resident Thai and foreign participants also agreed that non-local people are causing damage with boats in the area (Johann, pers. comm., 2016).

“Lots of outsiders come to lead tours and unlike locals who know the way around the corals, these people don’t. Local people break coral too but it’s only a tiny bit. Outsiders don’t know the way, they only come here for months, or days each year and end up going through risky areas, breaking more coral.” – Aleb, Chao Ley fisher, tour guide



Figure 4.4: The number of boats on the shores of Koh Lipe is increasing each year

A direct physical impact of increased recreational boating to coral reefs is boat anchoring. Boat anchoring was one of the most frequently reported impacts by research participants in this study. Participants who worked directly with the reefs, such as longtail boat captains and divers, noticed that boat anchoring was a major source of damage to the reefs surrounding the island (Kiang, pers. comm., 2016 and others). Participants reported to have observed locals, visiting Thai boat captains and tourists, visiting the island by sailboat, using an anchor on the reef in the waters surrounding Koh Lipe.

“A lot of people don’t care, they throw anchors on the reef.” – Maxi, Thai dive master

“Last week, two sail boats were anchored on the reef [right in front of the dive shop].” – Pieter, dive instructor

“I think this is the worst I’ve seen. From Koh Kra to the middle of Sunrise Beach – it’s really, really bad. It’s like the corals are getting destroyed, there’s landslide, because parts of the coral are getting broken, it’s rapidly becoming a place where we can’t take any customers – as opposed to a really nice dive site it was a few years back. And it’s only happened mostly in the last 3 years... Honeycomb Reef is suffering [too].” – Ray, dive instructor



Figure 4.5: Participant-submitted picture of anchor being used by long tail boat captains

Many participants reported to observe anchoring on diving and snorkeling sites in Tarutao National Park. To reduce anchor and other tourist pressure during the low season, the Department of National Parks closes all but four snorkeling/diving sites; however, participants in the diving community reported significant pressure on the few sites that remain open (Maxi, pers. comm., 2016).

“The fact that the national park is closed, or partially closed in the low season and they have to restrict places where the long tails can go, there’s a lot of pressure on where the longtail trips go now. So they go to ‘Honeycomb Reef’ which is on the south of Koh Adang and that’s getting destroyed because they don’t have enough buoys for all the longtail snorkelling trips, and ‘Koh Talang North’ is getting destroyed as well because all the snorkeling trips go there. And instead of managing the way they did with Koh Yang, where they had a big line where you can tie all the buoys, all the long tails to it, they didn’t do that – they haven’t done that. Now they put a couple of giant buoys where only a few big boats can tie their lines to, but it’s not enough for 20 long tails – sometimes we have 30 long tails over there.” – Ray, dive instructor

According to these resource users, the lack of buoy or mooring infrastructure to support an increase in boat visitation in the open snorkeling sites during the low season is causing a lot of damage to the coral reefs. A research participant who is recognised as a leader in the diving community suggested that pressure on the few open sites has only increased in the past several years and the park staff are not equipped to handle the additional pressure.

In addition to the pressure put on reefs by more boats and more frequent anchoring, SCUBA divers have also been observed to have an impact on the local coral reefs (Jesie, pers. comm., 2016 and others). Divers were observed to cause damage to coral by accidentally or intentionally breaking corals, scaring or touching wildlife, and removing wildlife from the underwater environment. Diver issues with buoyancy, strong currents, inexperience, and underwater photography were also observed by participants to lead to disturbance and destruction underwater.

“I have 3000 plus more dives, you know, and sometimes I kick the coral. For me, by accident, I mean I don’t want to break the coral but sometimes you’re taking care of your student and you just turn back and suddenly, like bang! – It has happened. So what about new divers? ... Imagine [the diving site] Stonehenge, 25 divers per day, and one person has kicked the coral, and this happens every single day.” – Tos, dive instructor and local business owner

Underwater photography was also reported by participants to be a contributor to diver-related coral damage. Getting the ‘best shot’ underwater, especially for small reef animals such as nudibranchs, sometimes require manipulation of the environment or animal position. Some diving instructors reported that many customers go to great lengths to get the best photograph. During an informal conversation, a diving instructor explained he once caused an argument with another dive centre after he witnessed and tried to stop their customer from intentionally breaking a piece of coral so they could get a better angle with their camera. Participants expressed that over time the

impacts from underwater photography may result in long-term damage, especially as the island grows in popularity for divers.

Several participants attributed damage to coral reefs to harmful behaviour by both tourists and local tour guides. For example, tourists were frequently observed walking on and physically inspecting coral close to the island during low tide and on the reef during snorkeling tours. Additionally, local tour guides have been observed bringing wildlife from the sea onto their boat in order to impress their customers (Ms. K, pers. comm., 2016). Participants also reported that many guides allow their customers to feed fish and stand on coral (Jesie, pers. comm., 2016). Aladin, a park ranger and one of the leaders of a marine conservation group on Koh Lipe, expressed that tour guides of Koh Lipe, who may or may not know better, end up setting an example and perpetuating this behaviour among tourists. Aladin told me, *“Tourists are as environmentally friendly as their tour guides.”* Though no research participants confessed to perpetuating harmful tourist behaviours, several suspected that many tour guides did not consider the long term consequences of their actions.

“Chao Ley people used to be poor so they are working hard towards getting material things”

– Pui, Chao Ley fisher, tour guide

“Chao Ley people are divided into many groups. Some of them see the importance of protecting the nature. If they have the brain to think, then they will realize there’s a future. That we still need to rely on this island. But there’s another group that say, ‘seize the day’, you know they will make the most out of each day. The core of that is from civilization and modernization that comes in – everyone is materialistic and wants to make the most to have everything.” – Aleb,

Chao Ley fisher, tour guide

“Some of them don’t take care of the coral because they don’t have any knowledge. Even if you tell them, don’t throw the anchor, they don’t listen because they don’t know” – Tos, dive instructor and local business owner

“Here, it’s all about the money. You look out on the water, you can’t see the damage, it looks very beautiful – until you get into the water and you start to see subtle damages that have accumulated over the years.” - Dave, dive instructor and local business owner

“I would say they don’t really look into the future, they say ‘OK today I want to make money and make the most out of it, how can I do that?’ ... In Thai we have a saying ‘you puk ma kaow doe ing’ – which means ‘you’re breaking your own rice pot’ ... you have a lot of rice to eat at once but then you cannot cook anymore,” – Ms. K, dive instructor

Aside from specific activities resulting in environmental degradation, a major theme from the research was Koh Lipe’s carrying capacity. Participants expressed that the volume of tourists being allowed to visit Koh Lipe and enter Tarutao National Park is beyond what the island and park can withstand. In the words of Gi, a leader of a major conservation group, *“Conservation is important, but it’s more important to limit the people coming [to Koh Lipe]. The capacity of the island has already been overpassed.”*

4.3.2: Infrastructure Development

A common theme in the semi-structured interviews was the notion that as Koh Lipe becomes increasingly popular for tourists, it also becomes popular for entrepreneurs who purchase land on the island in order to build hotels or restaurants. As a result, construction on the island increases each year and with it comes large cargo ships and longtail boats, each having their own impact on the marine environment surrounding Koh Lipe.

Cargo ships and longtail boats are heavily loaded with tractors and building supplies on the way in and waste material on the way out. Several participants reported these ships have and

continue to impact the coral surrounding Koh Lipe; they have seen many boats ploughing through coral reef areas and believe they can be blamed for increased broken corals, less coral cover around the island, and increased coral fragments washing up on the beach (Aleb, pers. comm., 2016 and others).



Figure 4.6: A platform on Pattaya Beach, Koh Lipe loaded with sand for construction



Figure 4.7: A tractor on Pattaya Beach transfers the sand from the platform to the construction site

Participants reported that infrastructure development in all areas of Koh Lipe has resulted in a huge loss of natural forests, wetlands and a disruption in the natural flow pathways for rainwater (Aladin, pers. comm., 2016). As a result, important reservoirs and wetland areas have been removed and rain and wastewater has no place to get naturally filtered (Aladin, pers. comm., 2016 and others). Consequently, wastewater from resorts, hotels, and construction that is typically dumped onto the ground can often be observed flowing directly into the sea. This problem is exacerbated during the rainy season when heavy rainfall causes large areas of the island to become flooded (Johann, pers. comm., 2016). Aladin attributes the growth of algae and related coral death surrounding Koh Lipe to an increase of nutrients flowing off the island in wastewater (Aladin, pers. comm., 2016). Chao Ley participants also reported that the quality of water is changing (Kiang, pers. comm., 2016). According to one Chao Ley participant, local people had not previously experienced issues with sea water until the onset of tourism but recently, many locals are getting rashes after coming in contact with sea water (Kiang, pers. comm., 2016).

Another by-product of development and tourism on Koh Lipe is the production of garbage (Sau, pers. comm., 2016 and others). Rubbish on the shores of Koh Lipe and in the sea was one of the most frequently reported impacts by participants. At the time of this study, a local rubbish collection group called ‘Trash Hero’ reported to have collected 100,000 kilograms of trash from shores on Koh Lipe and various islands in Tarutao National Park during weekly clean-ups since December, 2013.

“I’ve seen the island go from a pristine, tropical little paradise to a garbage pit that’s filled with all sorts of garbage – man made – most of it is brought to the island – you can imagine, literally everything that’s on this island has been brought here, some of the choices were good, some were bad... the bad things, where do you dispose of them? They’re either tossed into the

sea or dug into the ground and buried. So once you get into those kinds of things the ecosystem just goes from nice to bad. The ground is contaminated with building waste, human waste, and all your synthetic waste – plastic bottles, glass bottles and all of that is what’s destroying this island.” – Dave, dive instructor and business owner

“When we go out on snorkelling trips, we see bundles of garbage floating in the sea,” – Elias, local business owner

“Garbage is having a huge impact on the island,” – Lek, local business owner



Figure 4.8: A pile of garbage on Sunrise Beach from a tourist day trip



Figure 4.9: An empty tobacco package lies at the bottom of the sea near Koh Lipe



Figure 4.10: Participant-submitted picture of Styrofoam pellets mixed into the sand on the shore of Sunrise Beach

A leader of a beach cleanup organization on Koh Lipe explained the origin of rubbish found on the shores of Koh Lipe and in Tarutao national park:

“We took 600 plastic bottles [collected from Tarutao National Park], separated them by country, and 60% are from Malaysia, 20% from Thailand, 10% from Indonesia and 8% from the Maldives... The Indian Ocean goes in one circle and it brings rubbish from the Maldives all the way over to Thailand.” – Roman, one of Trash Hero leaders

Though increased rubbish was frequently reported as an environmental impact, research participants did not explicitly link increased garbage on the shores or in the sea to having a negative impact on the marine environment. During interviews, research participants reported that increased garbage was impacting the aesthetic and economic value of the island and local coral reefs; however, data from participant observation revealed the connection between garbage and the reef ecosystem. For example, following a snorkeling tour one day I assisted Ping, a Chao Ley tour guide, to remove an abandoned fishing net off the shore of Koh Adang. He indicated that it was good to save any fish that were still alive and prevent any further ghost fishing. I also witnessed

coordination between dive centers to organize the removal of a large abandoned fishing net near Koh Yang in an effort to prevent ghost fishing and prevent coral smothering. I was also present on several SCUBA dives where guides removed floating pieces of rubbish while diving, or cleaned the beach during surface intervals, in an attempt to prevent harm to marine life.

An overarching theme on this topic was the fact that participants perceived infrastructure development on the island to be occurring without any control from the Thailand government at all. Participant Ew said, *“Now, there is no control over development. The government should come in and make rules so the island and surrounding corals don’t get destroyed.”* Aladin, who works as a national park ranger reported, *“There has been a lot of [infrastructure] development on the island in the past five years. The government cannot control the development.”*

4.3.3: Fishing

“Traditional fishing sites have less fish now. Old fishing sites were at 15 meters, now they have to go at least 5 meters deeper to catch the same amount of fish,”

– Aleb, Chao Ley fisher and tour guide

“There is still a lot of fish and coral reefs around the island but there is less than before,”

– Beer, fisherman and tour guide

“Some types of fish have way smaller populations than before,”

– Kiang, Chao Ley fisher and tour guide

“I used to be able to walk off Koh Lipe and catch a huge fish, now that’s impossible,”

– Pek, working in tourism

“There are less fish than before,” – Sau, Chao Ley woman in fishing family

“Even 5 years ago, you could walk on the beach with a small net and you could catch enough fish for dinner, now that’s not possible,”

– Yaman, Chao Ley fisher and tour guide



Figure 4.11: Participant submitted picture of Chao Ley fishing traps during construction



Figure 4.12: One out of twenty Chao ley long line fishers holding one of five King Mackerel caught that day off the shore of Koh Lipe

Participants reported a reduction in fish catch during the past decade. Although the Thailand Department of National Parks officially bans all forms of fishing within park boundaries, participants believe the reduction in fish catch can be attributed to overfishing – including local

fish traps on the reefs, dynamite fishing, local long-line fishing and commercial fishing boats which have been observed line fishing and bottom trawling.

As stated in previously, in general, subsistence fishing by local Chao Ley fishers has been tolerated by national park staff despite the official ban on fishing inside Tarutao National Marine Park. Although local fishing activities do provide sustenance for fishing families and many fishers continue the tradition of sharing fish catch with their fellow community members, the majority of local fish catch is sold directly to tourist businesses or tradesmen. Further, although the methods Chao Ley fishers use, including hand-crafted fishing traps and hook and line, create the impression of a traditional, small-scale fishery, the number of local fishers, organization, and advanced technology optimize their efficiency and liken the system to large-scale commercial fishing operations (Wongbusarakum, 2002). I witnessed the scale at which local fishing occurred when accompanying Kiang, a local fisher, on a hook and line fishing trip one morning. Kiang caught five king mackerel that morning (Figure 4.12). In addition to Kiang's longtail boat, I counted at least twenty others in the surrounding waters.

Commercial fishing boats are frequently observed off the shore of Koh Lipe and Tarutao National Park. Ray, a dive instructor on Koh Lipe, reported that he once took a boat from the Pakbara Pier, a pier on the mainland of Thailand 1 hour east of Koh Lipe, to the Far Islands, a diving site approximately 1 hour west of Koh Lipe by longtail boat, and counted numerous fishing boats.

“If you take a boat one day from Pakbara to here, and then you go to the Far Islands in the same day, which is very hard but it's doable, I have counted sometimes up to 60 big fishing boats. And if you count 60 big fishing boats, and you multiply by the number of people living in them – I just know [from] passing very close to them with a longtail, I've

counted 20 people in one fishing boat – if you multiply 60 by 20, you get 1200 people living, floating in the national park – and that’s a lot of garbage also, coming from the fishermen, because we find rice bags everywhere, all the time. So I think it’s not only the amount of fish they take, it’s the food they consume and everything that goes overboard. I have never seen a fishing boat throw stuff overboard but sometimes we find clusters of rubbish floating and the only explanation we can find is that some fishing boats, they decide to throw everything overboard when they have a certain amount of garbage of the food they consume. So you have a floating village.” – Ray, diving instructor

Participants also believe commercial fishing boats are causing a lot of damage to the local coral reef ecosystems when bottom trawling, a fishing method where two boats link together to drag a net along the bottom of the sea (Tos, pers. comm., 2016 and others).

“I think we need to ban trawler boats – on the surface of the bottom there’s a lot of marine life, and [the trawler nets] get everything. Some sharks stay on these sandy parts. And not only that, they destroy all the history – how many ship wrecks got destroyed from [trawling]?” – Tos, dive instructor

Participants are unsure as to why illegal fishing occurs within the boundaries of the National Marine Park – some believe that there is not enough law enforcement staff in the Department of National Parks to accommodate for the tourism-related changes and illegal fishing, but there is also suspicion that Park Rangers accept bribes in exchange for allowing the commercial boats to fish inside the national park (Beer, pers. comm., 2016). Despite the widespread distaste for commercial fishing boats, almost all participants accepted the Chao Ley fishermen and their use of traditional fishing traps in order to make a living (Tos, pers. comm., 2016). This was true with the exception of sea turtles; several participants reported that local people greatly diminished

the local population of sea turtles after overfishing them for food, and believed they were an important species to attract tourists to Koh Lipe (Luca, pers. comm., 2016). The placement of fishing traps was also a major topic of concern for the diving community on Koh Lipe (see below).

4.4: Social-ecological Challenges 2016

Conflict among resource users in the Adang Archipelago is not a recent development. An in-depth study from the late 1990's reported ongoing tensions and conflict surrounding rights for resource use and difficulties balancing resource use with conservation. Considering several different resource user groups live simultaneously on Koh Lipe, each with their own agenda, it is not surprising that conflicts have arisen. This section aims to outline social challenges as reported by research participants in 2016.

4.4.1: External Developers vs. Chao Ley Community

A common theme in semi-structured interviews was the report that much of the Chao Ley community has been pushed from their original seaside villages inland in order to make room for developers. Participants described that with so few Chao Ley people having post-secondary education, developers could easily take over land ownership. Several participants reported developers made deals with large sums of money and some used force or threatened violence in order to take ownership over land on the island. The Chao Ley now have one main village on the northwest portion of the island and two smaller villages near Sunrise Beach with living accommodations and some small tourist businesses ("The Chao Ley", 2005; Wongbusarakum, 2002). The village graveyard, which originally sat near Sunrise Beach had to be moved to the neighbouring island, Koh Adang. Several research participants reported that they were living on land that used to belong to their family, but now belong to foreign developers. Chao Ley participant Sau, a resort worker and fisherman's wife said, *"This land does not belong to me anymore. It belongs to a big resort."*



Figure 4.13: A large resort has been built adjacent to one of the Chao Ley villages near Sunrise Beach. The owners reported that they are constantly disturbed by resort workers and the air conditioners next to their home.

Yetya, a Chao Ley elder who arrived on Koh Lipe during World War II, reported that she has been forced out of her home three times. Once, after protesting for her own land, she was arrested and spent four nights in jail. Now, in her fourth home, the owners of the neighbouring resort are threatening to force her to move again to make room for expansion. She is looking for help from non-government organisations and foreigners so that she can keep her land and remain in her home. In her words, *“I can’t sleep at night, I wonder, did I do something wrong?”*



Figure 4.14: Participant Yetya sits outside her home. The owners of a neighbouring resort has asked her to move to make room for expansion

Another common report among research participants related to the introduction of resorts on the island and how they restrict the movement of Chao Ley people. Research participant Nu said, *“Places used to be free for everyone to roam around. Now there are a lot of restricted areas. Hotels, private areas, and fences now prevent us from going everywhere on the island.”* With resorts often claiming areas on the beach for swimming, longtail boat captains reported to have trouble finding acceptable places to park their boats on the island. Several participants expressed shock by the rate at which development occurs.

“The environment is changing so fast. I’m focusing on my job. I wake up every day and go to work but I don’t realize that more buildings are going up. I am surprised to see that everything is changing. People need to work, they don’t spend much time with family and friends. We are living on a small island but it feels like we are living in the big city. I don’t want any more development on the island – there is already enough.” - Nu, Chao Ley fisher and resort worker

As a researcher, it was difficult to discuss the topic of marine conservation with individuals struggling to come to terms with dispossession and pressure from external developers. For these individuals, though it was clear they cared deeply for the island of Koh Lipe and the surrounding marine environment, their homes and thus the foundation of their lives were being threatened and therefore took higher priority.

4.4.2: Conflicts within the Chao Ley Community

Research participants expressed that recent changes in the local economy have affected the social dynamics of Chao Ley people on the island. Specifically, it is the introduction of currency and a higher cost of living are changing the way that local people interact with each other.

“I think before, it was easy. Before, you ask your friends to come, it’s full. But now, if you don’t have money, your friends won’t come. If you don’t buy beer, whiskey, your friends won’t come.” - Jode, Chao Ley fisher and tour guide

“Before, you could visit your neighbour and you didn’t need to bring any baht – you just went to visit and they would share their food, you would eat together, and there was no fighting... but when everything came, when more businesses came up, people starting fighting and being selfish. Everything uses money. Before, on this island, you could go all around this island without money but now you need it.” – Nu, Chao Ley fisher and resort worker

There is also an increased feeling of competition for resources on Koh Lipe. For example, some fishers described that they have encountered their own fishing gear damaged or trapped fish stolen by other members of the Chao Ley community.

4.4.3: Koh Lipe Community vs. National Park Staff

The introduction of Tarutao National Park has created tension between Koh Lipe community members and the government of Thailand. Participants who worked as fishers

expressed that though they are allowed to fish, they live in fear they will be stopped by National Park staff members and asked to pay a fine (Som, pers. comm., 2016). Several participants also voiced suspicion that federal park staff members were accepting bribes in exchange for turning a blind eye to commercial fishers.

Many community members expressed frustration with the government for introducing a mandatory national park fee. Each foreigner who visits Tarutao National Park, or any other national marine park in Thailand, must pay a fee of 200 Thai Baht. Tourism operators are therefore required to collect the fee and pay the Department of National Parks the total sum of money collected. The National Park Fee creates a lot of confusion for residents of Koh Lipe and tourists. The fee instills the belief that thousands of baht is going towards the national park each day when the fee is actually going to the Department of National Parks office, located in Bangkok. The lack of clarity as to where this money is going is frustrating to many people working directly with the tourists who are required to pay. Further, it is confusing for community members and tourists to see illegal fishing boats and traps, anchoring on the coral reefs, and general lack of maintenance in the park when tour operators collect thousands of baht in fees from tourists each day and hand it over to the national park. For example, several participants expressed frustration at the end of the high season when the offshore floating pier sunk and many large speedboats, heavily loaded with tourists and luggage, were forced to travel directly to the island, causing damage to the coral around Lipe in the process. Participants were not impressed that it was taking so long to repair the floating pier considering how much money the national park received in national park fees each day (Pek, Jode).

“You know the big platform by Lipe? That’s for big speed boats from Pakbara to stop first and then small boats, like long tails, they go to the beach. But now the big platform has a

problem, it's down. Before, long tail boat drivers took care of the platform but now it's a responsibility of the national park. The national park can replace the floating pier three times per day with the amount of money collected in fees in one day from Koh Lipe."

- Jode, Chao Ley fisher and tour guide

Participants also noticed that some tourists believed paying the national park fee compensated for any negative behaviour or damages to wildlife they caused inside the park (Elias, pers. comm., 2016).

4.4.4: Divers vs. Fishers

Local fishermen have been using hand crafted traps to catch fish for generations. Only two to three days of the month are suitable for trap deployment as powerful tides make it too difficult at other times of the month (Aleb, pers. comm., 2016). Using compressed air and long tubes, local fishermen descend up to 20 meters in search of an area with high fish traffic (Aleb, pers. comm., 2016). Once a site has been chosen, they secure their traps on the bottom of the sea with large rocks or pieces of coral. Since the island has become a popular destination for scuba divers, the traps have created a lot of controversy. Divers are known to damage local fish traps in order to allow the trapped fish to escape. Aleb, a local fisher and boat captain reported that it is usually visiting divers who destroy the traps, since they do not have knowledge of the local Chao Ley population; however, some local dive instructors admitted to opening or cutting open traps themselves. For example, in the words of a Thai diving instructor and business owner,

"You see the fish cages, I think it's not fair for this island or the divers if you put the fish cages in the dive sites. When you go diving you want to see some fish free - not in a cage like that... I have to say that I open them, 'cause I found the window that you can open – I open it. But before they don't have [a window], I saw some divers, and even me, I cut it. And you know how they pay us back? They just go dive with the tube and they break the

coral in Talang and they cut our buoy. I don't [open them] every time now. Sometimes I do it. If there are really rare fish inside, I cut it." – Tos, dive instructor and business owner

Damage to fish traps can represent a huge loss for local fishermen as they often rely on their catch for the income they gain from selling the fish, as well as food for survival. It is not possible to replace their loss with such a short window for trap deployment and the traps being so time-consuming to construct.

Reports of retaliation by Chao Ley fishermen were reported by several members of the diving community.

"At one point it became a vicious cycle of fishing cages being cut open by divers – the Chao Ley, they use the corals to hold their fishing cages down so it kills the coral, which pisses off some divers who cut open the cages – then the Chao Ley, also pissed off, they destroy big parts of the reef on purpose. The big barrel sponge, you remember? Did you ever see that one in Koh Talang? This one, they tore it down in between the time that I was there and [another diving colleague] was there. They went there and tore the whole thing down - in the middle of the day. This is so strong, these corals, so old, that it cannot be [natural], there was no bad weather, there was no current, and even an anchor by accident couldn't have done that." – Pieter, diving instructor



Figure 4.15: A Chao Ley fishing trap sits in the middle of Stonehenge, a popular dive site



Figure 4.16: Sau, a Chao Ley woman who works for a resort and is married to a fisherman said, *“We borrowed some money from my boss to build the net but the divers came and cut it. So now we don’t have any fish to sell to pay back my debt. We have no fish for food.”*

In Koh Lipe, conflict has arisen between users of the local coral reef. The clash that exists between divers, who want biodiversity conservation, and fishers, who wish to extract from the marine resource, is hindering sustainable usage of the important coral reef resource.

4.5: Chapter Summary

In summary, research participants reported a number of social and environmental changes on and around Koh Lipe over the past several decades since the introduction of Tarutao National Marine Park and the development of Koh Lipe as a recognized international tourist destination. The local indigenous population of Chao Ley people has largely changed their way of life, including relocating their homes and finding new sources of livelihoods. Many members of the Chao Ley community are still struggling to adapt to the changes and social issues have arisen including conflicts within the Chao Ley community, between Chao Ley people and newcomers, and between the Koh Lipe community and the Thailand government. These issues demonstrate that a large proportion of the community lacks social capacity and many experience feelings of mistrust.

A range of environmental issues were reported to be attributing to reduced coral cover, reduced fish catch, and increased pollution in the marine environment surrounding Koh Lipe. Figure 4.17 represents a summary of the environmental changes that have been observed related to tourism, development and fishing since the rapid development for tourism, with contributing external factors outlined. Though no empirical evidence can confirm the environmental issues observed by participants are true, they are widely reported in the literature as sources of degradation to the marine ecosystem, especially in this region of the world, and can therefore represent real threats to the health and productivity of the marine ecosystem, as well as the security of local livelihoods.

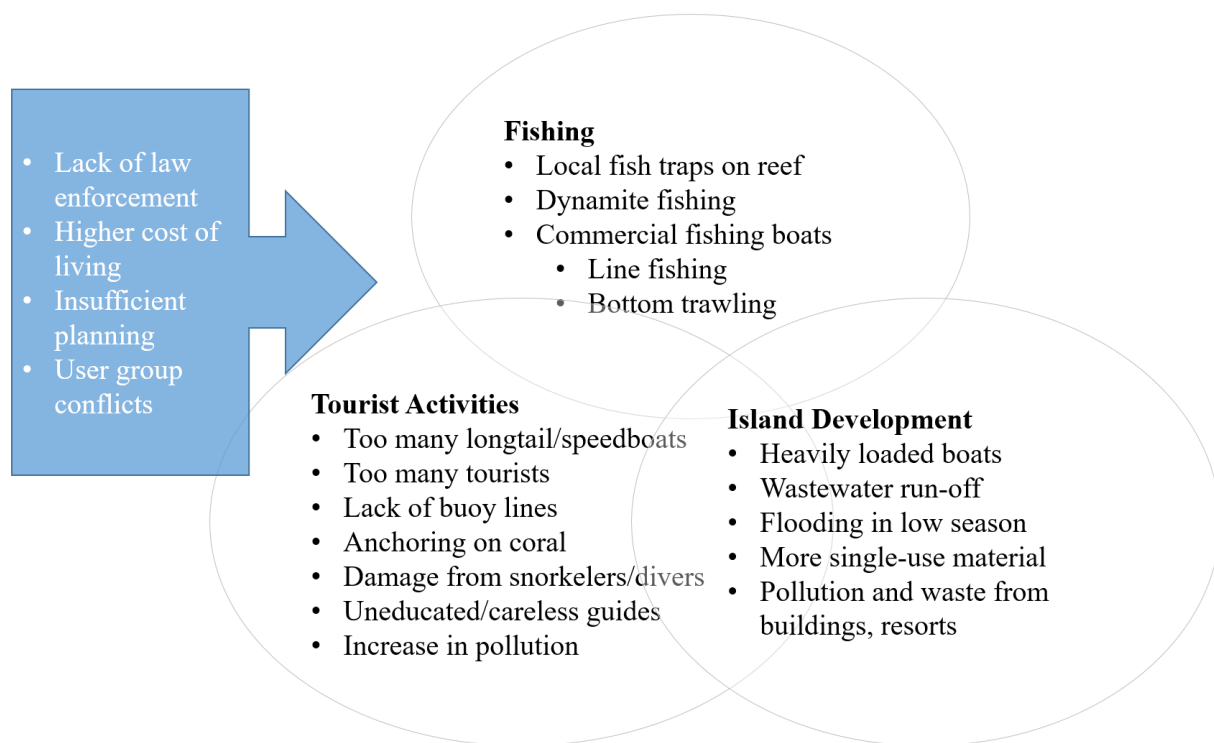


Figure 4.17: Summary of intersecting impacts and contributing external factors on coral reefs surrounding Koh Lipe as reported by research participants

Chapter 5

Ongoing Conservation Activities, Motivations for Conservation

5.1: Introduction

As outlined in Chapter 4, the community on Koh Lipe has observed major impacts on the local marine environment that they attribute to increased infrastructure development, overfishing and tourism activities. Through participant observation and semi-structured interviews, I learned how individuals and groups of community members are working to reduce these impacts on the marine environment. This chapter will outline how different groups of local stakeholders and individuals are addressing issues related to tourist activities, including snorkeling and scuba diving tours, the impact of boats and anchoring on the reef, and increased pollution on and around Koh Lipe. Each group description will outline its ongoing conservation efforts, factors motivating individuals in the group, challenges the group is facing, and changes the group wishes to see to either have more success as a conservation organization or for more successful conservation on Koh Lipe in general.

5.2: Reef Guardian

Reef Guardian is a national marine conservation organisation in Thailand that has a strong presence in Koh Lipe. According to one of the group leaders, Reef Guardian was formed in Thailand in 2007 by a small group of people native to the Thailand province, Satun (Aladin, pers. comm., 2016). The Australian government funded Reef Guardian during its initial year; however; Thailand's Department of National Parks and a project facilitated by the United Nations Development Program (UNDP) called Catalyzing the Sustainability of Thailand's Protected Area System (CATSPA) is currently providing funding.

The purpose of Reef Guardian is to protect coral reefs in Thailand and facilitate participation in reef protection at the community level (Aladin, pers. comm., 2016). Out of

approximately 250 people who have joined Reef Guardian in all of Thailand, 50 of them reside on Koh Lipe (Aladin, pers. comm., 2016). These 50 members are working in the tourism industry and frequently interact with the coral reefs in the area (Aladin, pers. comm., 2016). I had the opportunity to speak to members of the organization and community members who have participated in events organized by Reef Guardian on Koh Lipe and in Tarutao National Park including Aladin, Gi, and Jesie. The following section is based on discussion with these individuals.

Each year on Koh Lipe, Reef Guardian leaders organize several meetings with Reef Guardian members and coral reef stakeholders to facilitate a discussion about areas around Koh Lipe and in Tarutao National Park that require conservation-related attention. As a group, they decide where to focus their efforts and choose a day to take action. These meetings take place at the beginning and end of each high season on Koh Lipe. For example, several research participants explained that before the high season of 2015/2016, Reef Guardian facilitated a meeting with members and local reef stakeholders that resulted in a very positive day for the entire community of Koh Lipe. At the meeting, community members raised concern that there was not enough infrastructure installed near Koh Adang, a neighbouring island that was frequently visited by snorkeling and diving boats, to prevent anchoring. The community also expressed concern over the volume of trash in the ocean. As a group, they decided to organize a day in December designated for the installation of a long buoy line that could accommodate many snorkeling boats in the Koh Adang snorkeling area and also an underwater clean-up. For the buoy line installation, Reef Guardian group members were able to garner financial support from several local businesses on Koh Lipe in order to cover the cost of any needed materials, and physical cooperation and support from the Department of National Parks, the navy, all Reef Guardian members, Trash Hero

and several dive centers to assist with the installation of a long buoy line around the snorkelling site. Additionally, all dive shops were notified and invited to participate in an island-wide underwater cleanup on the same day. Research participants who reported that they participated in the event were very satisfied with the efforts made by Reef Guardian.



Figure 5.1: Buoy line installation by Reef Guardian and Koh Lipe community members in Tarutao National Park (photo submitted by Aladin Pakbara)



Figure 5.2: Aerial image of popular snorkeling site near Koh Adang where tourists use buoy lines to stay stationary in a strong current (photo, used with permission, by Nok, PPTV news, submitted by Aladin Pakbara)

In addition to community involvement in reef protection, Reef Guardian offers environmental education for people living on Koh Lipe. The organisation hosts several meetings throughout the year specifically for the participation of staff members from Koh Lipe hotels and tour operators. During these meetings, Reef Guardian leaders give several oral presentations about the rules of the marine park, basic biological information about the local marine environment and important species, and consequences of destructive behaviour such as anchoring, feeding fish, fishing important herbivores, and physically interacting with wildlife. During these meetings, Reef Guardian also distributes Reef Guardian t-shirts for the meeting participants and posters for tourist operators to display inside their boats, hotels or beach areas that illustrate rules tourists must follow for optimum reef protection (Figure 5.4). By educating tourism workers directly, Reef Guardian aims to prevent negative tourist or guide behaviour during snorkeling or diving activities.

Reef Guardian also leads education sessions for school children living on Koh Lipe, and has built a marine conservation-themed library at the school for students to do independent learning. Reef Guardian members communicated that education for children and youth was carried out in order to generate a familiarity and appreciation for the underwater world at young age. A personal communication with Aladin, one of Reef Guardian's leaders, revealed that their ultimate goal as environmental educators is to facilitate a connection between the reef and reef users so that no matter what the law is, they will act in a way that protects coral reefs from human damage.



Figure 5.3: Education sessions led by Reef Guardian for school children are often outside and require hands-on learning (Photo submitted by Aladin Pakbara)



Figure 5.4: Poster created by Reef Guardian that is widely distributed on Koh Lipe illustrates the activities tourists may and may not do for optimal reef protection in Thai, English and Mandarin

A summary of factors motivating Reef Guardian group members to engage in conservation can be found in Table 5.1.

Table 5.1: Summary of motivating factors reported by Reef Guardian group members

Motivating Factor	Quote
Instrumental Value	“If there is no coral, people will just travel to other places and tourism in Thailand will die” – Aladin “Money follows beauty. I can appreciate it. If I don’t have a reef, I cannot work. I want to work here, it makes me happy” – Aladin “Lipe is the last island in Thailand that still has this much healthy nature. I love this island and I want to maintain its beauty longer” – Ew “First, I value it because it’s beautiful. I love the coral reef. It’s very nice and very good. I studied about it. It’s very beautiful, very exciting, very peaceful.” – Aladin
Relational Value	“I was born in Satun and grew up close to Koh Lipe. I have seen it from the beginning and I don’t want to see it harmed by tourism” – Gi “The final destination of Reef Guardian is for tourists and guides – everybody – to know what activities are right and wrong [on the coral reef]. Even if we don’t have the laws of the national park, everybody knows and acts according to what is right and wrong and the reefs are managed by the local community” - Aladin

Though the conservation activities such as buoy line installation and underwater clean-ups on Koh Lipe are thought of, paid for and carried out by Koh Lipe Reef Guardian members and local reef stakeholders themselves, the meetings, permissions and event organization can be attributed to Reef Guardian leaders. With Koh Lipe’s location just outside of Tarutao National

Park, it is technically illegal for community members to take the initiative and install infrastructure on their own, whether or not they have positive intentions. Reef Guardian leaders are able to facilitate conservation activities as they hold a direct connection to Thailand's Department of National Parks and therefore form a bridge between communities in Thailand and the government. Through Reef Guardian, Koh Lipe residents are able to contribute their ideas and work for local coral reef conservation, as long as all required legal permissions are obtained. Despite this available link, research participants made it clear that this process is not quick and there is often a delay between a report and a response from Reef Guardian or the Department of National Park staff. This delay was one of the most commonly reported challenges associated with Reef Guardian and can be attributed to the fact that no Reef Guardian leaders currently live on Koh Lipe. Participant observation showed that the Reef Guardian leader who is most familiar and accessible to community members is named Aladin, a National Park Ranger, Reef Guardian leader and dive instructor who grew up in Pakbara, the mainland port nearest to Koh Lipe. Aladin's openness to conversation with local people creates a link between the community and the government and gives community members the opportunity to raise their voice when they require assistance on matters related to reef conservation. Despite this incredible individual effort by Aladin, his efforts to help Koh Lipe specifically are limited as he is also required to manage six separate national marine parks in the Andaman Sea.

Reef Guardian members expressed that the group needs more support from the local community and improved local leadership. With more support and better law enforcement from the Department of National Parks, the efforts made by Reef Guardian would go further. The efforts would also go further and be more effective with more involvement and advocacy from Koh Lipe community members themselves. For this reason, Aladin specified the need for education for local

people on Koh Lipe. Reef Guardian member and dive shop owner Gi said, *“Reef Guardian is only able to help protect the environment 10% - the other 90% comes from having additional support from other community members and from the government.”*



Figure 5.5: On Koh Rawi, while waiting for the tide to return so our tour group could take our longtail boat back to Koh Lipe, Aladin Pakbara explains the ongoing conservation efforts made by Reef Guardian

Community members expressed that though they appreciate the efforts made by Reef Guardian, the group would have a more meaningful impact if a group leader lived and worked on Koh Lipe. Participants felt that a greater presence on the island and a staff member designated to work daily on marine conservation efforts could help by creating a better connection between the community and the Department of National Parks, having a greater impact on tourists, and increasing the frequency of events related to marine conservation where community members can participate (Ray, Yaman).

“Those people who come here for coral conservation just come for a little while and there’s no follow up. There needs to be something similar to Trash Hero for reef protection, with

weekly activities... Otherwise in the future it will all be gone.” – Kiang, Chao Ley fisher and tour guide

5.3: The Fighting Boys

In 2012, five men in the Chao Ley community working as tour guides began to notice that the reefs around Koh Lipe were rapidly deteriorating due to anchoring and destructive tourist behaviour. They realized that as more people came to the island, coral destruction would only increase.

“When we went out on snorkeling trips, we saw many, many longtail boats throwing their anchors on the reef and when we tried to tell the captains that it’s not good for the coral, they didn’t like it. They didn’t listen and they told us it’s not our duty to tell them not to do this.... We decided that we should form a group and work together.” - Beer

Several years ago, a friend gave the group the name, ‘Fighting Boys’ and they have called themselves that ever since.

Fighting Boys member Pui told me, *“we are working and while we are working, we protect the nature.”* One of the main ways the Fighting Boys aim to protect the marine environment around Koh Lipe is through education. Group members make an effort to explain best practices for coral protection to tourists as they led tours themselves, while they were out on the water and notice any negative behaviour by other tour guides or tourists, and also at the end of the day, as they socialize with other longtail boat captains.

“[Tourists] come here and we tell them, you cannot feed the fish because it’s bad for the nature... It’s very good to say because the tourists don’t really respect the nature unless

you say this – they don't know, they just come to enjoy... It's better one of them [stops negative behaviour] than no one stopping, and if they have some friends, they can tell them the same thing.” – Pui

Pui reported that before leaving for snorkeling trips, the Fighting Boys, “*stop the boat, we speak about what we can do, what we cannot do, why, we explain.*” They make sure to instruct tourists not to step on or kick the coral, feed fish, touch or hold anything in the sea, or bring anything from the sea back to the boat for pictures and further explain why these actions have negative consequences for the coral reefs. For example, if Fighting Boys group member Jode sees tourists trying to feed the fish, he explains to them, “*now in Lipe we cannot give food [to the fish] because it's not good for the coral, you know? If fish eat the food, after fish cannot eat algae from the coral, and the coral dies.*” In addition to tourists, the Fighting Boys also try to educate fellow tour guides. Pui reported that after work, “*when we have time, when we have a group together, we sit and we talk... [we say] let's see how it's important for us – because we don't work for one year, we work for long, for our children to see also.*” By explaining to fellow tour guides the importance of protecting the coral from further damage, the Fighting Boys believe they can make a difference. I was able to witness the social nature of longtail boat captains when I got a call from Pui one evening, telling me he was ready for an interview. Most members of the Fighting Boys, along with a group of others long tail boat captains, were seated on the floor of an old restaurant, drinking whiskey and chatting. Jode told me that long tail boat captains gathered at that spot every night to chat, and it is during this time that they often speak about conservation issues around the island.

As more tour operators begin working in Tarutao National Park, both from Koh Lipe and also from Pakbara, anchoring has become a major problem on the coral reefs around Koh Lipe.

The Fighting Boys make every effort to prevent anchoring from happening while they are working. For example, when Jode sees other boat captains anchoring on the reef, he tells them, *“It’s not OK to do this, coral dies like this.”* Another group member, Beer told me, *“Yesterday morning, I went to tell someone not to throw their anchor on the reef and he told me, ‘it’s just for a minute so my customer can get into the water’ and then he pulled it up. But if I hadn’t said anything, he wouldn’t have pulled up the anchor...”*

The Fighting Boys also try to maintain the health of coral reef areas where anchoring frequently occurs. They reported that they have previously used days off to install or fix buoy lines to prevent further damage. Several years before joining Reef Guardian, they installed buoy lines at an important snorkel site called Koh Pung with financial assistance from a local resort. Pui told me that the Fighting Boys are also skilled free divers and often use wire to fix coral that has been broken by boats or anchors in order to speed up the regrowth process; *“We fix [the coral] also. It’s very simple. We could see that broken coral grows back naturally on rocks... We realized we could help – we go down to attach coral to rocks or other pieces of coral using electrical wire, that way the coral grows back faster.”*

All five members of the Fighting Boys joined Reef Guardian in 2015 and assist Reef Guardian with their coral reef conservation activities two or three times per year. They enjoy assisting Reef Guardian with the conservation activities because there is such a large group working together. Working with Reef Guardian also makes their work legal, as they are technically not allowed to make changes within Tarutao National Park without permission from the Department of National Parks.



Figure 5.6: Two members of the Fighting Boys group during an interview on Pattaya Beach, Koh Lipe

I was able to participate in a private snorkelling tour led by one of the Fighting Boy group members early on in my field season. The guide did not instruct the tourists on how best to behave on the coral reefs, as another member reported, however he did have a Reef Guardian poster hung inside his boat which outlined (in English and Thai) the activities that tourists may or may not do on the reef (Figure 5.4). Also, understanding that the tourists he was guiding that day were not strong swimmers, he outfitted them in life jackets and accompanied them into the water, ensuring they were far away from coral areas. At the end of the tour, we made a short stop at the neighbouring island, Koh Adang. While my friend and I were swimming along the shore, we encountered an abandoned fishing net in which many fish were caught, some still living and some dead. The guide was happy to help us free the fish from the net and removed it from the water. He told me that helping was part of his duty as a Reef Guardian member and that he joined Reef Guardian so that he could help protect the coral reefs in the area.



Figure 5.7: Fighting Boy member and tour guide during a snorkeling tour in Tarutao National Park

Factors motivating Fighting Boys group members to protect the coral were both intrinsic and economic. Table 5.2 summarizes the motivating factors of group members.

Table 5.2: Summary of motivating factors reported by Fighting Boy group members

Motivation	Quote
Intrinsic value	“Every day the nature changes. Every day you see less. There’s a problem with coral, everywhere it’s getting destroyed – here, maybe, probably one of the last pieces so we have to protect it.” - Pui
Instrumental value	“In fact, we are from here so we love the sea. So now, with more people we want to help. This is our job – we don’t have nature, we don’t have the job. We live from this so we have to take care. A piece of our family is nature.” - Pui “If we don’t have this, we cannot do nothing. We won’t have jobs, we can’t take customers to go on snorkelling trips. It’s important to protect this so we have jobs” - Jode
Relational Value	“We don’t work for one year, we work for long, for our children to see also” - Pui “We want to protect the corals for future generations. We want them to see the same things we are seeing today, the same beauty,” - Beer “If we don’t do any conservation here, what is the next generation going to do? There won’t be any jobs. Foreigners can

	leave if the coral dies and tourists stop coming but we, the Chao Ley, are concerned about our own future,” - Beer
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Only a few community members with whom I spoke on Koh Lipe were aware of the conservation efforts made by the Fighting Boys. A resort manager who has supported the group financially in the past told me he believes their efforts are important; however, he was glad when they joined Reef Guardian so that they could have more organisation, financial support and connections to the government workers in Tarutao National Park.

The Fighting Boys have and continue to face several challenges. Prior to joining Reef Guardian, the Fighting Boys had difficulty gaining support from the community on Koh Lipe for their conservation efforts – in fact, only one resort on the island has helped the group financially. The Fighting Boys claim the lack of support from the local community is the result of a lack of trust between Koh Lipe’s population of Chao Ley people and resident Thai and foreigners. Apart from any existing discrimination, support from the community may also be harder to garner as it is difficult for community members to actually see the results of any marine conservation work by the Fighting Boys as it is often very far from Koh Lipe island.

In the future, the Fighting Boys would like to have more financial and moral support from the community on Koh Lipe so they may go out and repair buoy or mooring lines as they are needed. They would also like to cooperate more effectively with the local government officials who govern Tarutao National Park. Presently, group members find it frustrating to wait for approval from the Department of National Parks or Reef Guardian when the issues feel much more urgent and could be easily fixed had they the funds to buy the materials as soon as they noticed a problem. As Beer told me, *“the Chao Ley go out every day and see the reef, they want to go out without waiting for support from Reef Guardian or the National Park and just install buoy lines*

themselves.” Though the group members appreciate the work that is being done presently, they believe much more energy could go towards marine conservation activities by community members.

5.4: Dive Centres

At the time of my study, there were 12 dive centres on Koh Lipe. I had the opportunity to interview and dive with several individuals who manage or work at a dive centre on Koh Lipe. Based on my semi-structured interviews, divers on Koh Lipe are very aware of the environmental impacts caused by increased tourists, development and fishing on or around the island. Divers also appear to be playing a large role in conservation activities either through their own personal intuition or under the leadership of another. Dive centres work both cooperatively and individually towards protecting the corals around Koh Lipe.

To address the issue of increased rubbish in the ocean, almost every diver I dove with or interviewed made an effort to remove waste from the ocean daily, as they are working; in the words of Dave, a dive shop owner, *“you don’t have to pick up a big trash bag every day, just pick up something! And if you do it every day, it adds up.”* Some dive centers will dedicate one day per year towards an underwater cleanup and on this day, customers dive for free and they work together to remove trash from the reefs. As previously mentioned, the year before my study, Reef Guardian organized a day dedicated to an underwater clean up and spread the word to all the dive shops on Koh Lipe. The idea took off and many dive shops participated in the event.



Figure 5.8: A diver collects a piece of garbage from the bottom of the sea at Koh Talang, a dive site near Koh Lipe

As outlined in Chapter 4, increased anchoring on the reefs is a major concern for community members. Anchoring is a concern for divers in particular as it causes damage to dive sites and creates a safety risk for divers who may be diving underneath boats. To address this issue, the dive centers decided to take collective action. Several months before my study took place, dive shop managers held a meeting and decided to implement the Professional Association of Diving Instructor (PADI)'s "Adopt a Dive Site" program. According to PADI,

"Adopt a Dive Site is a unique and powerful program to involve dive centers, resorts and leaders around the world in ongoing, local protection and monitoring of our favorite underwater playgrounds. It is an opportunity for outstanding PADI Pros and Dive against Debris leaders to take ownership of their dive sites. Participants will pledge to carry out monthly Dive against Debris surveys, reporting each month from the same location. In return, they'll be provided with survey tools to help implement their actions, a yearly report

on the state of their local reef and recognition tools to share their stewardship with customers and the community.”

- PADI, 2017; (<http://www2.padi.com/blog/2016/04/28/adopt-a-dive-site-project-aware/>).

My research participants explained that through the Dive against Debris program, each dive shop would be responsible for maintaining one dive site. Maintenance of dive sites includes collecting underwater rubbish, and in order to prevent anchoring, maintaining mooring and buoy lines, and obtaining the materials to re-install them if they happen to break. The divers I spoke to were very committed to the program and I sensed that they felt increased ownership over the reefs as a result. Pieter, an instructor told me, *“Everyone [takes care of the reef] by themselves now and when they feel the need to place a buoy they will do it.”* Maxi, a local dive master told me, *“When we see something under the water that we can handle, we just handle it.”*

The study results showed that divers, including visitors and local divers on Koh Lipe, were perceived by participants to have a negative impact on the coral reefs in the area. Members of the diving community that I spoke with explained that they make every effort to prevent reef damage and the first line of defense is education. Jessie, a diving instructor, told me she was fully aware of the negative impacts divers can have on coral reefs. In their words, *“We feel really bad about that but SCUBA diving is one of the important [tourist] activities in Koh Lipe and we can’t stop. So what we can do now is try to educate the diver.”* Instructors told me that they incorporate a lesson about the marine environment into their course material so that customers are aware they can have an impact while they are diving.

“I do try to educate people as much as possible about the impact of their action... That’s also something that I tell all my divers or students, you know, respect being there, respect the

environment. You don't want to hurt yourself and at the same time, you don't want to hurt other things that are living there... so be really careful where you put your hands, where you put your fins... I think education is always the best defence...” – Ms. K, dive instructor

Ms. K also outlined the importance of leading by example as a diving instructor,

“If I see any plastic trash floating around, I go and grab it... I have to admit that before I didn't really do those things. Only recently I started to do it because we start to notice a lot more trash, plastic trash, and fish nets, floating around. I noticed that as soon as you start doing that, people would follow you. So all it takes is having an example and people will follow suit.”

Aside from SCUBA diving courses, diver education can also occur during the briefing before each dive. Before entering the water, instructors and dive masters typically spend 5-10 minutes briefing their customers about the dive site and route they will be taking, species they might encounter while diving, the correct hand signals to use underwater, when to notify the leader they are low on air, what to do in case of an emergency and also, environmental awareness.

In addition to education, research participants who worked as a diving professional told me they can easily determine the level at which each customer is diving and select a dive location that has fewer hard, fragile corals to reduce direct diver-related damage. They can also adjust their position in the water column while diving, taking less experienced divers further away from the corals to cause any damage. Jessie, a dive instructor told me, *“if we see a diver that can't dive well, we just bring them to the semi-bottom – not on the reefs – so they don't have any chances to harm the coral.”* She added that she maintains the right to deny a diving certification if she feels customers cannot dive properly and would only increase damage to the marine environment.

As a participant observer, I observed a lot of cooperation among dive centers. At the time of my study, meetings were held at least once a month for dive shop managers to meet and discuss problem reef areas, necessary conservation measures, and dive center certification pricing. Social media appeared to be an important tool for the diving community to network, support each other, share ideas and report issues. A dive shop manager allowed me to access a private group on Facebook called “Koh Lipe Diving Community” where dive professionals from the island are able to discuss upcoming events, important issues such as recent reef damage, diving accidents, any negative tourist behaviour that needs to be addressed. They also used the group to contact each other if they needed help. For example, one dive shop manager posted that they were going to remove a large fishing net from an important dive site one day, and that help would be appreciated if other divers on the island were interested.

In addition to cooperating with each other, the dive centers on Koh Lipe are very cooperative with other organisations or government workers who wish to implement conservation on the island, such as the Department of National Parks and Reef Guardian. Very concerned divers who encounter a problem on the reef or wish to improve conservation measures in a particular area often contact one of the leaders of Reef Guardian. Having a friendly and conservation-minded person to go to with suggestions appears to make a difference to divers on Koh Lipe. One participant explained how he and his team sent a proposal to a Reef Guardian leader,

“He had a whole plan, and he sent it to Reef Guardian a couple of weeks ago but no response so far. The plan is to put several concrete blocks in Koh Talang and make a loop and all the snorkel boats, they can park outside the loop, just tying up to the rope so they don’t have to throw the anchors and it makes it safer for the divers as well, not having boats overhead. In the low season when the national park closes, everyone goes to Talang, all the snorkel boats

– *and you can go there anytime during the day and there will be one or two anchored on the reef*” – Pieter, dive instructor

This cry for help did not go unheard because shortly after this interview, large concrete blocks were deployed by the Department of National Parks at Koh Talang and used to create new mooring lines for snorkeling or diving boats.

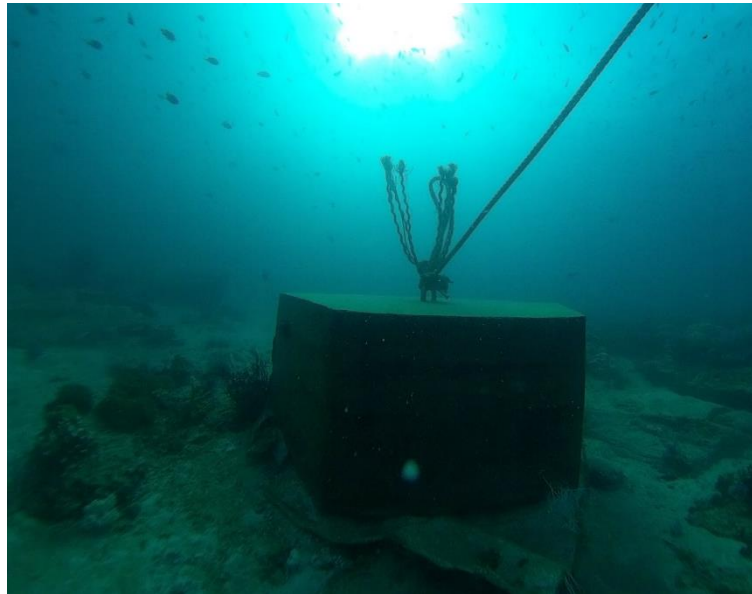


Figure 5.9: A large concrete mooring block deployed by the Department of National Parks to prevent anchoring at Stonehenge, a popular dive site near Koh Lipe

Diving professionals on Koh Lipe had a range of different factors motivating them to protect and conserve the marine environment. Table 5.3 summarizes the diver professionals’ motivations.

Table 5.3: Summary of motivating factors reported by Koh Lipe community members in the diving community

Motivation	Quote
Intrinsic Value	“The coral is still very nice so we should make sure to keep it that way” (Jesie) “Life underwater deserves to thrive, we are only guests” (Ray)
Instrumental Value	“This is our livelihood, right? We want to save it and keep it like this for as long as possible. If everyone who came here trashed the place then I’m gonna lose my job and so are all these people that rely on this place to make money. If the place is not beautiful anymore nobody is going to come.” (Ms. K) “This is the last island in Thailand where you can have really good diving” (Tos) “I love diving and I love the sea life, everything underwater and we don’t have much knowledge about the underwater – I mean the people in this world, so we try to protect and when we have more technology we can study them more and more” (Tos) “If there is no coral, people will travel to other places where there is still coral, and tourism [on Koh Lipe] will die” (Aladin)
Relational Value	“I don’t plan to have any kids but I’m just thinking about the next generation of humans who are gonna have to be here and suffer through all this crap that we’re creating right now” (Ms. K) “This is my home now, I want to keep it clean” (Dave)

In addition to the factors outlined in Table 5.3, some participants expressed that divers have a very special motivation for protecting the underwater environment. It was explained to me that instructors can see a transformation from a non-diver to a diver. People typically build a brand

new appreciation, and even a relationship between a human and the underwater world once they go diving for the first time. In instructor Jessie's words,

“You will see a difference between divers and non-divers. For divers, before they become a diver, they don't know about the underwater, the relationship between the water and the human. But once they get underwater, they see the beautiful coral reefs, and they see a whole beautiful world, and in their heart, I believe they slowly build the respect. If you talk to non-divers they say, ‘uh why? Why do I need to [protect]?’ They didn't see the underwater world and they didn't build up the relationship.”

Dive centre staff can easily do underwater clean-ups, fix and repair buoy and mooring lines; however, there are times when they are limited and conservation matters shift beyond their own power. For example, installing anchor-prevention set-ups requires large ships and trained professionals to transport large concrete blocks and install the necessary anchor-prevention set-up. Though there is assistance coming from local government and conservation organizations, the diving community does not think it's occurring fast or frequently enough. In the words of Tos, a dive instructor and local business owner, *“[In Tarutao National Park] there are only a few staff and a lot of work – things haven't changed in 5 years even though the island has rapidly developed.”* Increasing the number of staff available to help the local community and enforce national park laws would be one desired change by community members.

An additional concern reported by divers was the number of dive sites available around Koh Lipe. Participants believe that increasing the number of dive sites, and even adding artificial reef structures, would reduce the diving-related pressure on the existing dive sites around Koh Lipe.

As previously mentioned, a struggle exists between divers and local fishermen who place fish traps on diving sites and catch many reef fish species as a by-product. One fisherman I spoke to told me that when he uses fish traps, he releases any species of fish that belong to the reef and will not produce profit, however some divers told me they have encountered nets completely full of a variety of reef fish, many already diseased. This conflict creates a challenge for fishermen and divers and community members would like to see it resolved.



Figure 5.10: A local dive master inspects soft coral as a Chao Ley fishing trap gathers reef fish in the background at Stonehenge, a popular SCUBA diving site near Koh Lipe

5.5: Trash Hero

Pollution on Koh Lipe, in the sea and in Tarutao National Park is now a major issue. Every piece of plastic or unnatural material that is brought to Koh Lipe by ship, must be removed from the island by ship once it has been used. Currently, a cargo ship visits Koh Lipe once per week to transport all the waste back to the mainland. The removal process has improved in recent years; however, there is still a lot of garbage ending up on the beaches and in the sea.

After observing that pollution was only increasing over several years, a small group of people living on the island decided to take action. In December, 2013, 17 people traveled into a single beach in Tarutao National Park, collected all the rubbish they could find, and returned it to Koh

Lipe, where it was shipped back to the mainland of Thailand and disposed of. The group felt so positive after collecting bags of trash that they decided to continue cleaning beaches around Koh Lipe every single week. Roman, a diving instructor from Switzerland who was working on the island at the time, was among the seventeen people cleaning that day. He told me, *“We had a great day. Everyone was happy and I thought well, if those 17 people are happy, maybe more would be happy to join so let’s make it every week. Let’s make it every Monday and meet at the same time at the same meeting point so it’s easy to join.”* The group leaders decided to name the project “Trash Hero” and continue to meet every Monday to clean a beach in Tarutao National Park to this day.



Figure 5.11: Tourists work together to transfer garbage collected during a weekly Trash Hero clean-up onto longtail boats for transfer back to Koh Lipe and proper disposal. Pictures from weekly cleanups are shared on social media (photo by Oh Jirawat)

The goal of each Trash Hero weekly cleanup is to remove waste from beach areas, educate tourists and local people so they understand the long life-span of the materials they are using on a daily basis, and reduce the amount of single-use materials being used on the island. In addition to

the weekly clean-ups, the leaders of Trash Hero have developed reusable water bottles and work with local businesses so that tourists who purchase these bottles can refill them for free around the island. Clothing items have also been produced for local businesses to sell and promote the project. Every Monday, volunteers are invited to meet on Pattaya Beach and organizers explain to the volunteers why they are cleaning and how big the problem is in Koh Lipe, in Thailand and around the world. Local long tail boat captains are hired to transport everyone to a beach in Tarutao National Park and volunteers are given gloves and garbage bags. Once the clean-up is complete, tourists are offered free beer and fruit. Once everyone has been transported back to Koh Lipe, lunch is provided by one of the local resorts. Following each week of cleaning, organizers post pictures and information about the volume of trash collected on the Trash Hero social media page and shared publicly.

The leaders of Trash Hero, who live on Koh Lipe and come from both Thailand and Europe, have a lot of support from the local community to maintain this weekly activity; each week, local businesses make donations in the form of gloves, plastic bags, food, beer or transportation. The tourists return from Trash Hero cleanups with such a positive report that the community is eager to contribute to the project in any way they can; large resorts can afford to supply money to pay longtail captains or lunch for the weekly participants, and smaller businesses donate fruit, a box of snacks for volunteers or a couple of garbage bags. Local business owners like the transparency of the Trash Hero Project – cleanup organizers are volunteering their time and receive no payment for their work in Trash Hero and all donations are put directly into the weekly activity.

In addition to the weekly clean-ups, Trash Hero also gathered donations from various community businesses and individuals to distribute trash bins around the island. Each donor was acknowledged on the bin itself and volunteers distributed them around Koh Lipe.



Figure 5.12: Oh, one of Trash Hero’s leaders transports new garbage bins to various locations around Koh Lipe

Motivations for Trash Hero volunteers are described in Table 5.4.

Table 5.4: Summary of motivating factors reported by group members of Trash Hero Koh Lipe

Motivating Factor	Quote
Instrumental Value	“It’s one of the keys because basically what we’re doing by now, is we make advertisement for the island with trash” – Roman
	“I think it’s good to protect the environment and I want to show off Thailand’s beautiful islands to tourists. I think it’s good for tourists to help us clean them.” - Oh
Relational Value	“Things are slowly changing as people learn new ways of doing things” – Yaman
	“We go to the beach, we smile, we clean up and we motivate others to do the same – to inspire them to do the same. Because we want to do something good and we show the world we do something good, [and tell them to] please join us.” - Roman
	“We do this because we love the island. We want to keep it beautiful and healthy forever.” – Yaman

Overall, research participants held a very positive attitude towards Trash Hero. It was also the most frequently mentioned conservation effort during participant interviews. Resort managers in particular showed appreciation for Trash Hero as it often brings tourists back to Koh Lipe and back to their resorts. Participants believe Trash Hero is organized very well and has made a difference in many areas of Tarutao National Park. Some divers wished there was an organization just as efficient for marine environment protection however they were thankful trash hero cleanups were getting garbage off the beaches and away from the sea.

The participants of Trash Hero clean-ups are almost entirely foreigners visiting the island as tourists however there are several local people that have made a commitment to contribute to Trash Hero clean ups as much as possible. Chao Ley participant Lek has previously participated in a Monday cleanup with her children. Longtail captain Kiang is committed to working for Trash Hero every week during the high season. Other local people have been employed by Trash Hero to empty the rubbish bins distributed along the concrete streets on Koh Lipe.

Participant Ead told me that Trash Hero left her feeling conflicted. She feels a bit shy to join Trash Hero clean ups because there are so few Thai people participating. *“I saw them picking up trash on walking street once, and I thought it was a really nice thing to do, but I didn’t feel like I belonged. I didn’t feel very comfortable joining because it was mostly foreigners.”* Ead also felt a bit of embarrassment to be helping foreigners clean up her own country, in her words, *“I felt that if I participated, I might have felt ashamed for being Thai and not cleaning up the garbage already.”*

Some of the community members that I spoke with support Trash Hero and believe it is a good effort; however, they believe it is more of a Band-Aid solution to a major problem in Thailand.

They wish to see more organization from the government to reduce solid waste on the island, and more effective removal systems so there is less pollution ending up on the island and in the sea.

Despite the success of the project, those involved in Trash Hero explained that conflict has arisen among group leaders as the project grows in popularity and money becomes a factor. The tension has not stopped the weekly clean-ups from occurring, but important volunteers have moved on from the island. According to Roman, the Thai members of Trash Hero do not get involved or take sides, they call it ‘farang drama’. The fact that this type of drama is occurring, but the project is still moving forward each week with organization of dedicated Thai volunteers and donors shows that the activity is widely appreciated on the island.

5.6: Non-affiliated Community Members

Some of the community members I spoke with on Koh Lipe were not an official member of any of the aforementioned conservation groups. These people included local tour guides, fishermen, and those who owned or worked at a local business on the island. A portion of these individuals were making little to no effort to contribute to marine conservation efforts on the island at all. Individuals making little to no contributions to marine conservation were either unaware of the issue entirely, not in positions to assist as they were dealing with higher priority challenges related to their own health, well-being, and land security, or both. Individuals in this category who were not struggling with such challenges and recognized the marine environment as an important factor in their overall wellbeing and livelihoods reported making conscious efforts to reduce the local impact on the marine environment. This section acknowledges the efforts made by these people.

The most common way that individuals on Koh Lipe are contributing to conservation is by supporting existing conservation groups. In fact, many of the local people with whom I spoke have and continue to support the Fighting Boys, Trash Hero and/or Reef Guardian physically or financially. Based on my interviews, resort owners and managers are very happy to contribute to conservation organizations financially. *“I have already donated 10,000 baht to Trash Hero this year,”* said Luca, a resort owner. Pek, another resort manager on the island told me his company supports Trash Hero by donating money to pay for long tail boats and providing lunch for participants, and Reef Guardian by donating money to pay for buoy lines and volunteering a venue for important community meetings. As previously mentioned, one resort manager has supported the Fighting Boys financially and put them in contact with Reef Guardian (Aut, pers. comm., 2016). Individuals also participate in the events led by conservation groups. For example, they attend educational meetings or assist with buoy line installment organized by Reef Guardian or they participate in beach clean-ups or sell merchandise for Trash Hero (Lek, pers. comm., 2016 and others).

Snorkeling tour guides and tour companies have several ways in which they act to protect the coral reefs in Tarutao National Park. A snorkeling tour company owner told me that his staff provide a short briefing before each snorkelling trip outlining how tourists must not stand on or touch the coral and that all rubbish brought onto the boat must be brought back to the island and properly disposed of. On the water, guides reported that they make an effort to lead snorkeling tours responsibly. For example, they avoid anchoring by using mooring or buoying infrastructure, use reusable plastic lunch containers instead of Styrofoam, and enforce the rules laid down by the national park or Reef Guardian among their tour group members. Aleb, a boat captain and tour guide said, *“It is strictly forbidden to feed fish on my boat.”*

Some individuals take it upon themselves to address particular issues on the island. After many years with no public garbage collection bins on the island and much of the waste generated ending up on the beach or in the sea, a group of resort managers on the island worked with Trash Hero to place bins in various locations along the main roads on Koh Lipe (Figure 5.13). They also made sure that the garbage is collected multiple times per day and the garbage is removed from Koh Lipe quickly. Another group of people created a way for boat captains to properly dispose of used boat oil. Before these individuals addressed this issue, captains were dumping used oil into the sea (Kiang, pers. comm., 2016). The group created a dump site for used oil on the island and arrange to have it transported to the mainland where it can be properly disposed of.



Figure 5.13: Several resort managers worked together to distribute garbage bins around Koh Lipe. This picture was submitted by a photo elicitation participant to symbolize something for which they are thankful

Research participants who identified as fishers on Koh Lipe reported that in order to minimize their impact on the coral reef, they practice selective fishing and they respect the fishing

laws. In the words of a Chao Ley fisher, Kiang, *“I select fish according to the price that I get for them... but there are certain fish that if caught, I would never take them. For example, sharks. If I catch a shark I will throw it back.”* Though many Chao Ley fishers set traps that catch all species, they make an effort to release fish that are not for consumption. Kiang said, *“When Chao Ley people use fishing traps, we can see inside them and we only take the ones they need to sell. We put the other ones back.”* Kiang added that fishing for parrot fish has recently been made illegal and he respects that law. Aleb, another Chao Ley fisher said,

“I use a big fish trap. I usually trap for trevallies, sometimes big groupers, and some other commercial fish... We place the trap about 20 meters deep in an area with lots of fish. When we go back and get the trap, we bring the whole trap onto our boat. It’s on the boat where we start selecting fish. We select fish based on their market price. If something is worth money, we keep it, but if it’s not worth a lot of money, we throw it back in the sea... Sometimes reef fish, like parrot fish or angel fish, get caught inside but we don’t take those. If we catch them in time, we throw them back.”

Motivating factors for environmental conservation varied among participants. A summary of the motivating factors can be found in Table 5.5.

Table 5.5: Summary of motivating factors reported by community members not affiliated with a conservation organization

Motivating Factor	Quote
Instrumental Value	“Chao Ley people are divided into many groups. Some of them see the importance of protecting the nature. If they have the brain to think, then they will realize there’s a future, that we still need to rely on this island.” - Aleb

	“No one will come if there are no coral reefs so I like to make sure they are getting protected” – Aut “Tourists will keep coming and stay happy when the environment is protected. My life, my income relies on the environment so I want it protected as much as possible.” – Elias “Tourists will not come visit without the coral.” – Johann “A long time ago, the ocean was important because [Chao Ley] lives depended on it. They didn’t care if they had this island or not because they lived on boats. They came to this island because it’s far away from the mainland and they didn’t think anyone would find them. Now people have found them. The ocean is now important for our livelihoods,” – Lek “[Environmental conservation] is important to maintain the tourism industry. It’s a constant source of money for boat drivers. Unlike fishing, where you may never catch a fish.” – Yaman “Customers report that the ocean is getting worse and worse each year. This makes me feel personally responsible for the damage that’s going on. I make myself feel better by supporting all the local conservation efforts.” (Aut) “It’s beautiful. It has always been here, it’s peaceful and quiet and she’d like to keep it that way.” – Ead “It’s important to protect the nature here because it’s beautiful. A lot of damage has already happened but we need to protect what’s left. The children today don’t realize there used to be more.” – Aleb
Relational Values	“Political duty motivates me – everything I do is because I know I should help, it’s a positive thing,” Luca “I think it’s important to protect the nature for the future of this island. If we don’t, my children will not be able to see the beauty of my home. No one in my community has anywhere else to go, this is our home.

	I don't want Koh Lipe to end up like other islands in Thailand like Koh Phi Phi." – Kiang "I learned to fish with my family when I was very young. I want to teach my children but I'm afraid there will not be any fish left." - Kiang
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In general, research participants not affiliated with any existing conservation groups on the island were appreciative of the current conservation efforts; however, they expressed that they would appreciate more conservation activities, more education for local people and tourists, and stricter regulation for illegal fishing in the national marine park.

5.7: Chapter Summary

Several groups of people and individuals on Koh Lipe are taking the initiative to minimize and prevent negative impacts of tourism, fishing, and development on the local environment. The Fighting Boys, Reef Guardian and local dive shops all aim to reduce tourism-related damage to the local corals reef through tourist and tour guide education, the installation of mooring and buoy lines. Trash Hero aims to address the huge issue of solid waste accumulation on Koh Lipe and in Tarutao National Park. Fishers reported to selectively catch fish species and release species known to be important for the coral reef. Many other individuals, who are not associated with a particular environmental group, also make an effort to minimize and prevent negative impacts. There were some research participants who did not engage in conservation activities at all. These individuals

Participants reported to be motivated by all three categories of values: intrinsic, instrumental and relational. Table 5.6 presents a summary of priority environmental issues and ongoing conservation efforts being made to prevent further damage. Despite ongoing conservation efforts, participants could see much room for improvement. Table 5.7 summarizes desired changes related to environmental protection among groups of research participants.

Table 5.6: A summary of priority environmental issues and ongoing local efforts to mitigate these issues

Category	Issue Observed by Research Participants	Local Effort to Address Issue	Group responsible for effort
Tourist Activities	Too many boats	—	—
	Too many tourists	—	—
	Anchoring on coral reef	Buoy and moor line installation	Reef Guardian, Dive Centres
		Education for guides	Reef Guardian, Fighting Boys
	Direct damage from snorkeling and diving activities	Education for divers	Dive centres
		Education for guides	Reef Guardian, Fighting Boys
		Education for tourists	Reef Guardian, Dive Centres, Fighting Boys
		Education for school children	Reef Guardian
		Attempting to fix broken coral	Fighting Boys
	Tour guides setting bad example	Education for guides	Reef Guardian, Fighting Boys
	Increase in garbage	Underwater cleanups	Dive Centres, Reef Guardian
		Beach cleanups	Dive Centres, Trash Hero, Individuals working in tourism
		More efficient waste collection	Trash Hero, Unaffiliated Individuals
Fishing	Overfishing	Selective Fishing Practices	Fishers
	Dynamite Fishing	—	—
	Bottom Trawling	—	—

Island Development	Wetland removal	—	—
	Increase in pollution from resorts and development	Resorts managed to be eco-friendly	Individuals working in tourism
	Heavily loaded boats transporting building materials	—	—
	Deforestation	—	—

Table 5.7: Summary of marine conservation-related changes desired by research participants

Desired Changes	Local Diving Community	Tour guides and Fishers	Other Tourism Workers	Government Staff	Resident Foreigners
More local leadership/support	✓	✓	✓	✓	✓
Faster/more effective cooperation with DNP	✓	✓	✓	✓	✓
Education for locals	✓	✓	✓	✓	✓
More marine conservation activities	✓	✓	✓	✓	✓
Education for tourists	✓	✓	✓		
Law enforcement for illegal fishing	✓	✓		✓	✓
Wastewater management		✓		✓	✓
More effort to preserve Chao Ley Culture		✓	✓		
Less Development		✓	✓		
Fewer boats		✓			✓
More dive sites	✓				

Chapter 6

A Discussion of Research Findings and Implications for Management

6.1: Introduction

Thus far, this thesis has addressed three of four research objectives of this study. Chapter 4 addressed the first objective by outlining research participants' perspectives on the environmental and social changes that have occurred on Koh Lipe. Chapter 5 addressed the second objective by outlining how the community of Koh Lipe has been responding to these social and environmental changes. Chapter 5 also addressed the third objective, to explore factors that motivate or drive Koh Lipe community members to engage in conservation activities related to the local marine environment. This chapter provides a discussion and summary of the research findings, outlines the limitations of the study, and addresses the fourth research objective, to explore the implications of this study on conservation development in Koh Lipe and in reef-based tourism.

6.2: Social and Environmental Changes

6.2.1: Social Changes

The Adang Archipelago and its inhabitants have experienced major changes since the introduction of Tarutao National Marine Park in 1974 and the subsequent recognition of Koh Lipe as an international tourist destination. Since these events, the population of Koh Lipe, which has historically consisted of Chao Ley people and tradesmen, has almost doubled in size as national park staff, external developers, and national and international workers have moved to the island (Pakbara, pers. comm. 2016). As a result, many different groups are currently living simultaneously on Koh Lipe, all with different values, goals, and motivations.

The displacement and land insecurity experienced by Chao Ley people on Koh Lipe due to the creation of Tarutao National Park and newcomers with tourism-development goals is not new to this region of the world; in Southeast Asia, beachfront property has become a valuable

commodity and there is high competition for ownership (Knudsen, 2012). Studies have shown that once an area is nationally recognized as a tourism destination, external entrepreneurs become keen to move in and start the construction for personal businesses (Cohen, 1983). For example, in a study by Bersales (2003), community members in Panglao, a small touristic island in the Philippines, reported that tourism has been restricting their access to the sea, restricting their movement around the island, incurring conflicts surrounding land ownership rights, and family relationships were suffering as a result.

According to Cohen (1983), once outsiders move to a new tourist destination, development happens very quickly and any existing small-scale tourism becomes transformed into an industry where profits are mainly felt by the outsiders (Cohen, 1983). The introduction of the tourism industry does create opportunities for local people to find employment; however, it also attracts more outsiders and therefore increases competition against the local people for employment (Cohen, 1983). While external entrepreneurs and workers are reaping the benefits, the communities that originally inhabited the area, such as fisher folk, are often left out, they become increasingly marginalized, and are more susceptible to displacement (Knudsen, 2012). Knudsen (2012) explains that based on their long histories of poverty, fishing families are typically not well equipped to defend their rights for the land on which they are living, or negotiate another, more positive outcome for themselves. Without any money or education, fishing families are unable to afford to secure a formal land title and can easily be forced out to make room for those with more money and better municipal, provincial and national connections.

On Koh Lipe, the Chao Ley have historically lived a laid back lifestyle with land, food and resources shared among community members and it was not customary for Chao Ley families to legalize land ownership (The Chao Ley, 2005). Considering these factors, along with participants'

reports of outsiders threatening violence, it is not surprising that outside entrepreneurs were successful in displacing much of the Chao Ley population.

Finding #1: Though many people in the Chao Ley community have clearly adapted to recent social changes quite well, this research demonstrates that many are still recovering from traumatic conflict, adapting to new living environments including new homes and restricted areas, coping with changes in their traditional ways of life, and withstanding pressure to keep up with the changing economic environment.

6.2.2: Environmental Changes

Research participants reported a long list of factors related to tourist activities, fishing, and development, that they consider to be contributing to the observed reduced coral cover, increased broken coral, fewer and smaller available fish, and increased pollution on land and in the sea.

Recreational boats were commonly identified as an issue related to tourism activities. Participants expressed concern that long tail and speedboats were increasing in number around the island, operated by inexperienced drivers, and led to direct coral damage from anchoring or bottoming out. Recreational boating is recognised in the literature as a major source of damage to marine ecosystems (Burgin and Hardiman, 2011). The problem is not specific to Koh Lipe, in fact, globalization and a rise in tourism has caused an increase in recreational boating in many areas around the world (Burgin and Hardiman, 2011; Davenport and Davenport, 2006). Recreational boats been found to have physical, chemical and biotic impacts on aquatic ecosystems (Burgin and Hardiman, 2011). Although the nature of aquatic ecosystems make it difficult to isolate and measure specific impacts, recreational boat usage typically directly or indirectly results in a lower water quality, a change in species composition, physical disturbance, and the damage or disruption of underwater plants and animals (Burgin and Hardiman, 2011; Gergel et al., 2002). With coral reef substrate being the foundation of coral reef ecosystems, any physical, chemical or biotic

impacts could have cascading impacts on the entire ecosystem, with coral particularly vulnerable as regeneration can take years (Davenport and Davenport, 2006).

Anchoring is a problem for aquatic ecosystems because as the wind, current or tide shifts a boat on the surface, the anchor and chain drag on the sea bed, causing breakage and fragmentation of coral and the formation of ‘halos’ in seagrass meadows (Davenport and Davenport, 2006; Wilkinson, 2002). Boat anchoring has long been acknowledged as a source of physical disturbance and destruction to coral reefs. In a study in the British Virgin Islands, researchers studied the impact of a major, one-time anchoring event that occurred in a coral reef area previously untouched by tourism activities. The study showed a significant loss of coral cover and complexity and a decline of approximately one quarter in abundance of small reef fishes (Forrester et al., 2015). The study was able to isolate the effect of anchoring from other global, regional and local factors working simultaneously to negatively impact coral reef ecosystems, making its associated negative impacts very clear. Heavy and widely dispersed usage of recreational boating and anchoring, as observed in Koh Lipe, has a major impact on coral reef ecosystems (Shivlani, 2007; Wilkinson, 2002). The impacts of anchoring can be minimized through mooring structures and although mooring itself has been shown to have an impact in coral reef areas through excessive shading (Rogers, 1979) and concentrated use for tourism activities such as diving, they are generally accepted as they reduce damage caused by anchoring (Shivlani et al., 2007; Salm et al., 2000; Wilkinson, 2002).

Tourists engaging in snorkeling and diving activities were also observed to cause direct damage to marine life in the waters surrounding Koh Lipe. As outlined in Chapter 3, despite SCUBA diving and snorkeling often being touted as an environmentally friendly tourist activities, studies from around the world have shown that intensive recreational diving and snorkeling

negatively impacts coral reefs (Burke *et al.*, 2011; Dearden *et al.*, 2007; Harriott *et al.*, 1997). Aside from direct physical damage, such as trampling, touching, and kicking corals and other reef animals, the presence of divers and snorkelers has been shown to alter coral reef ecosystems. For example, Hawkins *et al.* (1999) found that diver presence changed the coral community structure of Bonaire in the Caribbean, with less diversity in areas where divers frequented.

The observed negative impacts of divers and snorkelers by Koh Lipe community members is supported by findings from the Andaman coast of Thailand by Augustine *et al.* (2016) who found a shift in diver specialization from evenly distributed low, medium and high specialization divers in 2000 to primarily low and medium specialization divers in 2012.

Infrastructure development-related issues were also frequently reported by research participants. Wastewater run-off from tourist-related businesses was a major concern. According to the literature, wastewater runoff containing untreated sewage and industrial waste, as there was reported to be on Koh Lipe, contains high quantities of nutrients that facilitate eutrophication (an increase in primary production) (Todd *et al.*, 2010; San Diego-McGlone *et al.*, 2008). In coral reef areas, eutrophication can have a direct impact on both coral and fish (Todd *et al.*, 2010). Phytoplankton blooms have been observed to reduce fish growth rates, increase mortality and alter fish behaviour as they frequently lead to clogging of fish gills, less visibility, and less available oxygen due to such high decomposition rates of algae (Todd *et al.*, 2010; Breitburg, 2002; Jogensen and Richardson, 1996). Furthermore, there are several ways in which higher nutrient levels can impact coral reefs. For instance, higher nutrients in the water is associated with an increase in the presence and severity of coral disease on reef building corals (Bruno *et al.*, 2003; Kaczmarzky and Richardson, 2011). For some corals, an increase in nutrients, particularly nitrogen and phosphorus, also reduces the fertilization success and embryo development (Harrison and Ward, 2001).

Additional nutrients in the water also promotes the growth of algae, a resource competitor of coral that can eventually smother and kill entire coral colonies (Lapointe, 1997).

Pollution on the shores and waters of Koh Lipe was a tourism and development-related issue reported by almost all participants. Marine litter, or anthropogenic-originated solid waste that ends up in the ocean, is an environmental issue affecting oceans, waterways and shores all over the world (Irwin, 2012). Considering the fact that there are millions of tons of marine litter added to the world's oceans each year and a recent estimate by Jambeck et al. (2015) that the East Asian continent produces the highest amount of marine debris in the world, it is not surprising that community members on Koh Lipe are observing pollution on land and in the sea to be a major issue (Barnes, 2002; Irwin, 2012). Marine debris can originate from land, such as Koh Lipe itself or other land masses in Southeast Asia, entering the ocean through water run off or the wind, or from the sea from shipping, fishing, or tourism-related boats (Roman; Todd et al., 2010). The durability and resistance to degradation of debris means that once it has entered the sea, it will stay there for a long time (Barnes et al., 2009). Marine debris has very negative consequences for marine life. Ingestion of marine debris by underwater species may cause internal blockages, poisoning, and/or starvation (Derraik, 2002). Entanglement in marine debris or lost or abandoned fishing gear may prevent marine life from effectively feeding and cause animals to drown, suffocate, sustain injury, or starve (Derraik, 2002). In a 2015 literature review by Gall and Thompson, a total of 208 different species were found to have ingested marine debris, and 243 species reported to have been entangled in marine debris. Out of these reported species affected by ingestion and entanglement, 17% were listed as threatened or near threatened on the IUCN Red List (Gall and Thompson, 2015). Research also shows that marine debris can act as a vessel of transportation for invasive or non-native species (Barnes, 2002). With such a large proportion of

marine life being affected directly or indirectly by marine debris, Gall and Thompson (2015) suggest that when combined with other anthropogenic impacts, it could possibly have an impact on populations, trophic interactions or species assemblages. This could be a very serious impact should important or keystone species be affected (Gall and Thompson, 2015).

In addition to the environmental impacts incurred by marine debris, there are economic impacts that make it more difficult to both carry out and benefit from coastal activities (Newman et al., 2015). For example, marine debris incurs direct costs to coastal municipalities for its collection, transport and removal from coastal areas (Mouat et al., 2010; Newman et al., 2015). Additionally, should the presence of marine debris offend tourists or local people, it may also damage the reputation of a tourist destination, decrease the number of visitors and consequently reduce revenue from the tourism industry (Gregory, 2009). Fishers may also face economic loss from marine debris should they experience debris-related restricted or contaminated catch, damaged fishing equipment or damaged fishing vessels (Mouat et al., 2010).

Finally, issues related to fishing were very frequently reported by participants. Unsustainable fishing and harmful fishing practices, such as trawling, have been documented in Thailand since the 1960's, with observations of major declines in stock biomass through to the 1980's. Participant reports of excessive local and commercial fishing around Koh Lipe are therefore not surprising (Pauly and Thia-Eng, 1988). Fishing, especially at a large scale, has an effect on both the community and life-history of a marine ecosystem (Stergiou, 2002). In a 2002 literature review, Stergiou reported that fishing was linked to benthic habitat destruction, a change in species composition, less species diversity, extinction, changes in trophic interactions including predation and competition, and individual species changes in stock abundances, body mass, sex ratios and size at maturity. In coral reef areas specifically, the removal of herbivorous fish has been

shown to increase macroalgal cover, disrupt natural microbiomes of coral, increase the occurrence of disease, and the frequency of mortality (Zaneveld et al., 2016).

Finding #2: Research data and published literature suggest environmental impacts related to overfishing, infrastructure development and tourist activities represent real threats to the health and productivity of the marine environment and the sustainability of the tourism industry and local livelihoods on Koh Lipe.

6.2.3: Social-ecological Challenges

As a result of these social and environmental changes, a number of different social-ecological challenges have arisen. Tensions between resource user groups on Koh Lipe are ongoing. According to the literature, it is very common for conflicts to arise among user groups of common-pool resources and a study on the Adang Archipelago from 2002 suggests that conflict not new to the area (Warner, 2000; Wongbusarakum, 2002). As outlined in Chapter 3, communities are not homogeneous and individuals within them are unlikely to share the same values, interests, or levels of resource extraction (Barrett et al., 2001; Leach et al., 1999; Robinson and Sasu, 2013; Seixas and Davy, 2008). Additionally, conflicts over natural resource management are known to be associated with developmental pressures, economic inequalities, cultural differences, and multiple interests (Warner, 2000).

As described in Chapter 4, external developers have displaced and restricted the movement of many Chao Ley families in order to build or expand tourist businesses, generating fear, conflict and feelings mistrust between local people and newcomers. Reports made by Chao Ley participants of protests, arrests, and threats of violence in this study indicated these feelings are lingering, especially towards those expanding infrastructure development on the island. Further, the introduction of the National Marine Park, with strict rules but inconsistent and irregular law enforcement, has created an atmosphere of mistrust and suspicion towards federal employees. A

lack of transparency related to national park fees only deepens these feelings and indicates an imbalance of power between the Thailand government and the Koh Lipe community. Finally, conflicts among resource users within the Koh Lipe community has resulted in resentment, mistrust, and further environmental degradation.

Finding #3: The social-ecological challenges that have arisen among and between resource user groups on Koh Lipe have generated feelings of mistrust, resentment, and suspicion. These feelings are an indication of weak horizontal and vertical linkages and power imbalances. These factors are reducing the efficiency of existing conservation regimes and inhibiting the sustainable use of the marine environment.

6.3: Ongoing Conservation Efforts on Koh Lipe

Tarutao National Marine Park was introduced by the government of Thailand in 1974 to prevent human-related damage and preserve the important ecosystems in an area of the Andaman sea approximately 1500 km². Though this marine park was created with positive intentions and has undoubtedly resulted in many positive outcomes for the marine ecosystem, it is not unlike other instances of top-down natural resource management around the world in that its establishment failed to acknowledge the human well-being and livelihood needs of local people in the area (Wongbusarakum, 2002). As a consequence, illegal activities, such as fishing and trapping, are frequently observed. As Berkes (2015) points out, such illegal activities only lead to further ecosystem deterioration, conflicts among resource user groups and with government staff, and a continued belief that communities do not have a role in conservation. Based on results from this research, in addition to illegal fishing activities, the same consequences are resulting from rapid island development, the presence of too many tourists, and tourist activities on Koh Lipe. A summary of all environmental and social issues reported can be found in Figure 4.17. Participant reports of inconsistent monitoring of resource boundaries and enforcement of limitations of

resource harvesting or use suggests the government of Thailand may lack the capacity to effectively manage Tarutao National Park. Therefore, if the government of Thailand still aims to prevent human-related damage and preserve the important ecosystems in this area, it is unlikely to occur should they continue to rely solely on Tarutao National Marine Park.

As outlined in Chapter 3, a top-down approach to resource management based on Hardin's (1968) theory that "freedom in a commons brings ruin to all" (p. 1244), such as Tarutao National Marine Park, fails to recognize interactions among individuals and the unique social and cultural circumstances that govern these interactions in any particular situation (McCay, 2002; Peters, 1987). Though the government of Thailand recognizes the importance of local level involvement in resource management and has incorporated the idea in their constitution since 1997 (Wittayapak and Dearden, 1999; Dearden et al., 2017), stakeholders who participated in this study indicated that communication and cooperation with government employees was difficult and often took a long time. For example, Beer, a member of the Fighting Boys group communicated that it often took so long to get permission to make changes in the national park, such as installing buoy lines, that the group sometimes took action without consulting government employees at all.

It has been observed that local institutions can emerge and engage in commons resource management if they recognize a problem, link this problem to their own actions, and perceive the problem as something they can solve (McCay, 2002). This study encountered individuals and groups that meet all three of these criteria. Chapter 5 outlined several groups and individuals on Koh Lipe who have identified various issues related to tourism activities, fishing, and development, linked these issues to their own behaviours, and came up with action-based solutions. Table 5.6 summarizes how the groups or individuals on Koh Lipe are tackling specific issues reported. These findings indicate that on Koh Lipe, local-level institutions are emerging to

address this commons problem. The efforts made by Koh Lipe community members can be better understood by revisiting the literature on community-based and co-management approaches to conservation.

6.3.1: Community-Based Conservation

Several ongoing conservation efforts encountered in this study can be categorized as community-based. As the aforementioned definition by Western and Wright (1994) describes, community-based conservation entails “natural resources or biodiversity protection by, for, and with the local community,” (p. 7). On Koh Lipe, several existing groups demonstrated conservation taking place by, for, and with the local community.

The three groups that demonstrated community-based conservation efforts included the Fighting Boys, Trash Hero, and the diving community. Individual community members that were unaffiliated with any particular group also engaged in activities that can be considered community-based conservation. The Fighting Boys, a small group of Chao Ley fishers and tour guides, identified that some tourism activities were harming local coral reefs and affecting the sustainability of the ecosystem. They recognized that they had the power to prevent this from happening in the future and focused their efforts on providing education for tourists, speaking informally about marine conservation issues with other tour guides, and making an effort repair coral while freediving.

Trash Hero group leaders, including local people and resident foreigners, observed that beaches on Koh Lipe and in Tarutao National Marine Park were rapidly becoming garbage pits as a result of tourism and ocean currents. The group leaders recognized they had some power in preventing this from happening and focused their efforts on organizing a weekly beach cleanup with participants from Koh Lipe and tourists from all over the world. The leaders aim to clean up

a specific area of Koh Lipe or beach in Tarutao National Park each week and educate weekly participants about pollution and waste consciousness.

Many of the dive centres encountered in the study also engage in community-based conservation activities. They recognized that ocean currents, inexperience and a lack of knowledge can allow divers to become a direct cause of coral reef damage. Many instructors and guides on Koh Lipe consequently utilize their role as instructors and leaders to educate visiting divers about best diving practices and encourage environmentally responsible behaviour during interactions with the reef. They reserve their right to withhold diving certifications from individuals who lack the skills or confidence to dive without impacting the marine environment. The diving community also recognized the impact boats can have on corals when anchoring and collectively decided to utilise PADI's "adopt a dive site" campaign. Since this decision, each dive center is responsible for maintaining buoy or mooring lines at one dive site. Some dive centres also organize or participate in underwater clean-ups, or simply make an effort to remove garbage from the reef with each dive.

Individuals on Koh Lipe who are not affiliated with any particular group contribute time and money to support these locally-led conservation efforts, and make various other efforts aimed at protecting the natural resources of Koh Lipe. For example, some individual business owners make an effort to minimize the impact their individual establishment has on the environment and some individual fishers reduce bycatch by releasing ecologically important reef fish from their traps.

Barrett et al. (2001) report that existing diversity in a community, by gender, age-group, social status, and levels of power, often prevent community members from sharing values, interests or motivations. This in turn prevents local-level institutions from facilitating biodiversity

conservation. The efforts made by the Fighting Boys, the diving community, Trash Hero and select individuals unaffiliated with any particular group, demonstrate that on Koh Lipe, this is not the case. Together, these locally-led institutions form a large group of people of varying backgrounds, gender, social status and levels of power who share the same values, interests, and aspirations: those relating to the protection of the marine environment. Interviews with participants in this group revealed there to be a variety of factors motivating them to engage in conservation activities, including but not limited to, the natural beauty of the marine environment, the security of their livelihoods, and the desire to preserve the rich natural resource for future generations.

In addition sharing values and interests, each of these locally-led conservation groups demonstrated strong leadership and social learning. For instance, the efforts made by the Fighting Boys during evening gatherings to discuss coral conservation approaches with other tour guides from Koh Lipe is a form of social learning. Similarly, divers on Koh Lipe communicate with their students and other divers on the island during casual encounters on the island and intentionally using social media. By sharing experiences and knowledge with fellow colleagues, the Fighting Boys and diving community aimed to “develop a common framework of understanding and basis for joint action,” (Schusler et al., 2003, p. 311).

The organizers of Trash Hero also demonstrated exceptional leadership. The success of Trash Hero, indicated by community-wide acceptance, financial support, and participation, was made possible because each of the group leaders maintained clear goals, were consistent with activities, and fully transparent with all financial matters.

Finding #4: Several groups within the Koh Lipe community are engaging in community-based conservation. These groups demonstrate social learning and good leadership.

6.3.2: Co-management

In addition to community-based conservation efforts, there was one group on Koh Lipe approaching conservation through the use of co-management. As defined in Chapter 3, co-management is a partnership and sharing of power between government and local people in regard to a particular area, resource or set of resources (Berkes, 2004; Berkes, 2015). Co-management has at least one strong vertical linkage between the government and local-level resource users and a predetermined and formal arrangement for which the power and responsibility are shared (Berkes, 2015; Berkes, 2009; Pinkerton, 1989). Reef Guardian is an organization that utilises international and government funding and federally employed staff to facilitate community meetings, lead educational sessions, print informational signs, and organize community events related to marine conservation. Though Reef Guardian and associated meetings are technically led by government staff, the topics of discussion at these community meetings and the specific issues addressed are determined by community members themselves. Additionally, anyone in the Koh Lipe community can become a member of Reef Guardian and take part in community meetings and events.

The presence of Aladin, a leader of Reef Guardian and staff member of the Department of National Parks, created a strong, vertical link between community members and the Thailand government. I observed that community members from all backgrounds felt comfortable reporting ongoing marine conservation issues and possible solutions to these problems with Aladin and in turn, he listened and made an effort to address them. As an outsider and participant observer, Aladin's presence in the community of Koh Lipe appeared to be quite significant. His passion for coral reef conservation, hopes for the future of Koh Lipe, and openness to involving the local community in conservation efforts make him invaluable to the community.

Reef Guardian demonstrates several components (outlined in section 3.6 of this thesis) that have been reported to contribute to a successful co-management approach. For instance, in basing their conservation efforts and activities on decisions made by local Reef Guardian group members during community meetings, the group demonstrates power sharing between the local community and the government. Furthermore, the introduction of Reef Guardian to the Koh Lipe community, where no formal, relevant group existed before, a group that anyone in the community who is interested in marine conservation can join, has also effectively built local institutions. By encouraging the Fighting Boys, a locally-led conservation group, to join Reef Guardian, they have also improved existing local institutions. Additionally, by holding community meetings and educational sessions for group members and resource stakeholders of all backgrounds, during which participants can learn while openly and honestly engaging with each other and Reef Guardian group leaders, Reef Guardian is facilitating the formation of positive relationships and building trust in both horizontal and vertical linkages. Combined, these actions, along with the fact the group creates “an arena for knowledge co-production, trust building, sense making, social learning, vertical and horizontal collaboration, and conflict resolution,” (Berkes, 2009; p. 1695), indicate that Reef Guardian serves as a bridging organization for the community of Koh Lipe.

Finding #5: The co-management of marine resources on Koh Lipe is being facilitated by a bridging organization called Reef Guardian. Reef Guardian effectively shares powers between the local community and government, creates and builds upon existing local institutions, and builds positive relationships and trust within vertical and horizontal linkages. One of Reef Guardian’s leaders allows for a particularly strong vertical linkage between the community and the Thailand government.

6.4: The role of motivations and drivers in conservation efforts on Koh Lipe

As outlined in Chapter 3, motivations and drivers play a large role in the nature and level of participation of local people in conservation activities. In this study, research participants who worked in the marine environment every day described intrinsic, instrumental and relational values that motivate and drive them to engage in conservation activities. Tables 5.1 to 5.5 illustrate the values motivation for engagement in conservation activities between various groups in the Koh Lipe community. Contrarily, some research participants were not motivated to participate in conservation efforts at all due to the fact they were unaware of issues related to marine conservation, dealing with more pressing challenges related to their own health, well-being and land-security, or both.

The fact that many resource stakeholders on Koh Lipe possess internal motivating factors based on relational and intrinsic values of nature is an indication that environmental conservation is important for the overall wellbeing of these individuals (Souto et al., 2014). Further, the fact that they possess external drivers based on the instrumental value of nature suggests that these individuals link a healthy marine environment to their livelihoods. It also indicates that on Koh Lipe, marine conservation serves as an economic incentive for the maintenance of local livelihoods. The fact that some research participants lacked motivation to engage in conservation entirely is an indication that poor social circumstances is a reality for some people living on Koh Lipe. These individuals have no option but to prioritize their own needs for survival over biodiversity conservation. Furthermore, unless conservation efforts directly improve their circumstances and livelihoods, these people are unlikely to ever prioritize biodiversity conservation (Souto et al., 2014).

Finding #6: Participant motivations and drivers for engagement in conservation activities indicate that the marine environment is important for both their well-being and livelihoods. Some

participants' lack of motivation to engage in conservation and prioritization of survival needs over biodiversity conservation indicates that poor social circumstances a reality for some on Koh Lipe.

6.5: Factors limiting local involvement in conservation on Koh Lipe

The existence of ongoing, locally-led conservation efforts on Koh Lipe that fall into categories of community-based and co-management approaches to conservation indicates that natural resource management on Koh Lipe is shifting from a centralized resource governance system, with emphasis on Tarutao National Marine Park, to a decentralized, co-management-style governance system, with Tarutao National Marine Park being complemented by locally-led and co-managed groups in the community. Despite this shift, the priority social and environmental issues outlined in this thesis, many of which remain unaddressed entirely (see Table 5.6), suggest there are gaps to be filled both by the national park staff and natural resource stakeholders in Koh Lipe. Research participants reported several factors that were limiting the effectiveness of conservation regimes on Koh Lipe.

Despite the aforementioned efforts by the co-managed group, Reef Guardian, it was indicated over the course of this research that the Koh Lipe community could feel the absence of the Thailand government in several ways. For example, participants frequently observed illegal activities in Tarutao National Park with no apparent law enforcement, including commercial fishing and fishing practices known to cause ecosystem deterioration. Participants were also under the impression that the government makes little effort to control development on the island. This issue, indicated by ongoing infrastructure development, has resulted in the loss of important ecosystem services, such as rain and waste water filtering and sequestration, which is in turn affecting the marine environment and well-being of local people. Participants also expressed that it is difficult to communicate with government staff which means that priority environmental issues often persist for some time before getting necessary attention. This perceived 'absence' of

the Thailand government by the Koh Lipe community suggests that in general, vertical relationships between the Koh Lipe community and Thailand government staff may not currently be very strong. As outlined in Chapter 3 of this thesis, the management of relationships across institutional levels forming the basis of resource co-management is as important as managing the ecological system (Berkes, 2015; Olssen, Folke and Berkes, 2004).

Research participants of this study also reported an absence of individual actors or groups within the local community demonstrating leadership. Specifically, a leader or local committee that deals explicitly with marine conservation issues, was reported to be a factor limiting local involvement in conservation. For example, several participants expressed that having an organization similar to Trash Hero, one that focuses specifically on marine conservation issues, would be extremely valuable. Reef Guardian, a conservation group utilizing a co-management approach, does involve the local community in marine conservation; however, many resource stakeholders living on Koh Lipe are not members of Reef Guardian and are therefore unrepresented in management plans. The infrequency of Reef Guardian-led conservation activities also limits the effectiveness of this co-managed group. With local leadership being recognized in the literature as critical for self-organization, resolving conflicts, building local institutions, and facilitating the development and maintenance of horizontal and vertical relationships, this represents a major limitation for effective local involvement in marine resource management on Koh Lipe (Olssen, Folke and Berkes, 2004).

Although the community-based conservation efforts made by groups on Koh Lipe indicate shared values and motivations for biodiversity conservation, conflicts among resource user groups and an inconsistent effort by all resource users, suggest that the goals for biodiversity conservation of the Koh Lipe community are unclear. As outlined in Chapter 3, having the capacity to manage

natural resources at the community level involves a community-wide adoption of specific goals, and the strength to maintain these goals (Barrett et al., 2001). The absence of clear conservation goals therefore represents another limitation to the success of co-management on Koh Lipe.

Finding #7: Local-level involvement in marine conservation activities is perceived by resource stakeholders to be limited by a lack of support from the Thailand government, an absence of local leadership, and unclear goals for conservation among resource user groups.

Examination of two case studies from literature where community-based and co-management approaches to conservation were successful, including one in Koh Pitak, Thailand (Dearden et al., 2017) and one in the Raja Ampat Islands of Indonesia (Dirhamsya, 2013), allows for a better understanding of the limitations to local-level involvement in marine conservation in Koh Lipe. Although the paths to successful local-level involvement in conservation were shaped by factors unique to the place of each example, they still provide valuable insights for this discussion.

In the example of Koh Pitak, a community-based ecotourism initiative reported by Dearden et al. (2017), there were several factors contributing to its success that appear absent in Koh Lipe. For example, Koh Pitak had a strong leader who encouraged a community-wide vision for conservation and community social capital that facilitated cooperation among its members. Furthermore, development for tourism on Koh Pitak occurred with thorough planning and direct community involvement.

In the example from the Raja Ampat Islands reported by Dirhamsya (2013), the success of a co-management approach to conservation was based on strong support from the government, NGOs and academic institutions, the presence of community leaders, and local-level participation

in the planning and implementation of marine conservation activities. This initiative also emphasized the importance of effectively sharing power, building local institutions, and strengthening relationships both vertically and horizontally.

These case studies support the findings of this report that a lack of strong government support, local leadership, shared conservation goals, and strong vertical/horizontal relationships are limiting local involvement in marine conservation on Koh Lipe. As the management of natural resources on Koh Lipe shifts away from top-down control towards co-management and increased local-level involvement, it is important that observed limitations to co-management are addressed.

6.6: Summary of findings and implications for management

In summary, this study uncovered seven findings related to the first three research objectives of this study which included an examination of the (1) social and environmental changes that have occurred in Koh Lipe in recent decades and how these changes are impacting the marine environment; (2) ongoing, locally-led conservation efforts being made in response to these changes and; (3) factors motivating local-level involvement in marine conservation activities. This chapter also examined limitations of local-level involvement in marine conservation activities in Koh Lipe. The following list summarizes the research findings of this study:

1. Though many people in the Chao Ley community have clearly adapted to recent social changes quite well, this research demonstrates that many are still recovering from traumatic conflict, adapting to new living environments including new homes and restricted areas, coping with changes in their traditional ways of life, and withstanding pressure to keep up with the changing economic environment.
2. Research data and published literature suggest environmental impacts related to overfishing, infrastructure development and tourist activities represent real threats to the

health and productivity of the marine environment and the sustainability of the tourism industry and local livelihoods on Koh Lipe.

3. The social-ecological challenges that have arisen among and between resource user groups on Koh Lipe have generated feelings of mistrust, resentment, and suspicion. These feelings are an indication of weak horizontal and vertical linkages and power imbalances. These factors are reducing the efficiency of existing conservation regimes and inhibiting the sustainable use of the marine environment.
4. Several groups within the Koh Lipe community are engaging in community-based conservation. These groups demonstrate social learning and good leadership.
5. The co-management of marine resources on Koh Lipe is being facilitated by a bridging organization called Reef Guardian. Reef Guardian effectively shares powers between the local community and government, creates and builds upon existing local institutions, and builds positive relationships and trust within vertical and horizontal linkages. One of Reef Guardian's leaders allows for a particularly strong vertical linkage between the community and the Thailand government.
6. Participant motivations and drivers for engagement in conservation activities indicate that the marine environment is important for both their well-being and livelihoods. Some participants' lack of motivation to engage in conservation and prioritization of survival needs over biodiversity conservation indicates that poor social circumstances a reality for some on Koh Lipe.
7. Local-level involvement in marine conservation activities is perceived by resource stakeholders to be limited by a lack of support from the Thailand government, an absence of local leadership, and unclear goals for conservation among resource user groups.

The findings of this study have several implications for the management of coral reef resources on Koh Lipe, including some that are applicable in other coral reef areas around the world. The following list describes the management implications of this study.

1. The social capital on Koh Lipe should be strengthened

The social capital on Koh Lipe was demonstrated to have weak points based on the ongoing social-ecological conflicts, a lack of local leadership, power imbalances, and weak horizontal and vertical linkages. The literature outlines several effective methods to strengthen the social capital in a community that are applicable to this case study. First, efforts should be made to create and build upon existing local institutions in order to strengthen and empower the local community (Berkes, 2009). The local institutions should aim to improve conservation efforts and local livelihoods (Dirhamsya, 2013). In Koh Lipe, existing institutions, such as the diving community and the ‘Fighting Boys’ could be encouraged by government or NGOs to continue and expand their efforts. Examples of new, local-level institutions that might be appreciated on Koh Lipe include those related to organising tourism, planning marine conservation activities, preserving Chao Ley culture, or conducting community surveillance (Dearden et al., 2017; Dirhamsya, 2013).

Social capital could be further strengthened by working to resolve ongoing conflicts and preventing further conflicts between and among community groups. On Koh Lipe, conflicts involving land ownership, resource use, and national park laws should be resolved as soon as possible. A possible avenue for resolving ongoing conflicts is the involvement of bridging organizations. Bridging organizations have been known to assist with conflict resolution by linking local institutions to upper level institutions, facilitating productive discussion, and building trust (Berkes, 2009).

Public education initiatives would also strengthen social capital on Koh Lipe. Education could take shape in Koh Lipe similar to how it unfolded for a co-managed lobster fishery in Newfoundland, Canada (Davis et al., 2006). In this example, researchers from the local university organized presentations to improve public awareness of the lobster resource (Davis et al., 2006). On Koh Lipe, presentations could aim to increase public awareness of coral reef ecosystems, benefits of their conservation, and best practices when guiding tourist activities. In Koh Lipe, presentations of this nature are offered by Reef Guardian; however, research participants of this study explicitly expressed that they wish to see more public education to learn about coral reefs and best practices for conservation, so increasing the frequency of these presentations and increasing public awareness of their occurrence would be beneficial.

2. Community participation in planning and implementation of coral reef management should be encouraged.

At the time of this study there were limited opportunities for community members on Koh Lipe to participate in coral reef management. Increasing these opportunities would reduce conflict, illegal activities, and ecosystem deterioration while helping the community to reach conservation goals (Berkes, 2015; Dirhamsya, 2013). Considering the ongoing conservation efforts occurring on Koh Lipe at the local level, as well as the intrinsic, instrumental, and relational values that motivate engagement in these efforts, there is much potential for community participation in management planning and implementation. Specifically, the Koh Lipe community should be involved in setting clear goals and outcomes for conservation initiatives. This is important considering the community's lack of a common vision or goal for conservation was demonstrated to be a limiting factor for local-level involvement in conservation in this study.

On Koh Lipe, community participation could be facilitated through the use of a bridging organization, such as Reef Guardian, or an ‘extension officer’, as done in the co-managed tourism initiatives in the Raja Ampat Islands of Indonesia (Dirhamsya, 2013). Extension officers are similar to bridging organizations in that they work with the community to facilitate communication with NGOs and government, discussion, and decision making (Dirhamsya, 2013).

The participation of the Koh Lipe community in the planning processes of coral reef management could also be implemented by initiating local-level environmental management projects. Locally-initiated environmental management projects were demonstrated to further conservation efforts in the community-based ecotourism example from Koh Pitak (Dearden et al., 2017). A relevant example from the Koh Pitak case study is the construction of an artificial reef off the coast of Koh Pitak that served to increase fish habitat, enhance local marine biodiversity and help supplement fisheries income (Dearden et al., 2017). An artificial reef would be an excellent locally-led environmental management project for the community of Koh Lipe, especially considering several research participants of this study expressed a desire to construct artificial reefs in the waters surrounding Koh Lipe to increase both available fish habitat and diving opportunities. Other environmental management initiatives being utilized in Koh Pitak could be adopted by the Koh Lipe community such as the creation of ‘no-take’ zones to preserve marine areas with abundant biodiversity and the use of “Environmental Management” waste balls to assist with the disposal of organic waste (Dearden et al., 2017).

3. The snorkeling and SCUBA diving industries can be used as incentives for improving coral reef protection and providing sustainable livelihood opportunities

Considering the contribution of snorkeling and diving tours to the local economy of Koh Lipe, as well as research participants’ reports that instrumental values motivate engagement in

conservation activities, there is an opportunity to use these industries to sustain local biodiversity and livelihoods. As outlined in Chapter 3 of this thesis, it is important to consider the characteristics of divers and snorkelers, including their satisfaction and specialization levels, when managing coral reefs for this purpose (Augustine et al., 2016). On Koh Lipe, the community could work with government staff to set limits of acceptable change (LACs) for specific regions of Tarutao National Park, with these specific regions corresponding to different diver and snorkeler specialization levels (Augustine et al., 2016). Dive shops on Koh Lipe could also offer a wider array of training programs intended to boost divers specialization level (Augustine et al., 2016). Dive shops could also consider offering volunteer ecotourism activities, as these options have been shown to increase diver satisfaction and decrease diver-related damage to coral reefs (Barker and Roberts, 2004; Dearden et al., 2007).

4. An ecological monitoring program should be initiated to document the health of coral reefs in Tarutao National Park

Although data reported by research participants combined with a review of the literature suggests the marine environment surrounding Koh Lipe is experiencing degradation due to overfishing, tourism activities, and island infrastructure development, there is no empirical data from this region specifically that proves any of these factors are true sources of marine degradation. If citizen scientists on Koh Lipe developed a formal but simple ecological monitoring program for Tarutao National Park, the community efforts may be taken more seriously by the scientific community working for NGOs, the government and conservation groups (Dearden et al., 2017). Such a program would also dispel any mistrust or doubts people hold for community-based conservation initiatives (Dearden et al., 2017).

5. The capacity of the government staff managing Tarutao National Park should be improved.

Although it is difficult to infer management implications relating to the Thailand government without speaking to more than one government staff member directly, the results from this study indicate that the Thailand government may currently lack the capacity to effectively manage Tarutao National Park. This possibility was indicated by participants of this study who reported to observe a lack of law enforcement for illegal fishing and destructive fishing practices in Tarutao National Park, a lack of control over infrastructure development on Koh Lipe (and subsequent loss of important ecosystem services), and a lack of availability for consultation with community members. Suggestions to improve the capacity of government staff include hiring more national park rangers and improving park ranger training to highlight the importance of both biodiversity conservation and local-level involvement in conservation.

6.7: Limitations of Study

The results of this study were limited by the nature of the qualitative research, the methodologies utilised to collect and analyse data, and myself, as the researcher. This section describes these limitations in detail.

The nature of this qualitative study, and consequent lack of quantitative or empirical data to supplement the results, is a limitation of this study (Barrett et al., 2001). Though observational data can confirm the occurrence of specific activities, such as illegal fishing or destructive fishing practices, without supporting empirical data, we must infer from similar, empirical studies how these activities are affecting the ecosystem in this specific region.

Despite my best efforts to prevent sampling error and ensure data validity, inherent challenges related to the methodology used in this study may also have provided limitations to the

research results. For example, limitations may have arisen from the use of purposeful and snowball sampling (Patton, 1999). The results may be biased or poorly represent the community of Koh Lipe considering I only interviewed a small portion of the island's population (approximately 2.3%) and only selected participants who I believed, or was led to believe, would assist in answering my research questions (Patton, 1999). Furthermore, it is possible that my own judgement (in selecting research participants and deciding when the data was saturated enough to stop recruiting new participants) prevented me from accessing information or new perspectives that would not have occurred had I used other sampling techniques.

The results may also have been limited by the composition of research participants interviewed for the study. For example, though I had several informal conversations with employees of the Thailand government, I only formally interviewed one. It was an error on my part as a researcher, and not a conscious decision, to underrepresent government staff in this research. With my focus being on the local community and their perspectives, it did not occur to me to seek more participation from government staff until I was deep in data analysis and no longer in the field. Furthermore, there were several instances when I encountered Koh Lipe community members who I thought could contribute valuable information to this study, but were simply not available or interested in participating. For example, despite my numerous attempts to meet, the leader of the Chao Ley community was not available for an interview.

Though there could be many different reasons, it is possible I was unable to gain participation from some community members because the island has already been the topic of several studies. This was indicated to me during an informal conversation with a volunteer for Reef Guardian who told me that students visit Koh Lipe to carry out similar research projects very

frequently. It is possible that some community members were not interested in participating because they have participated in similar studies in the past.

Participation in the photo elicitation portion of the research was particularly low and this could be attributed to several factors. For instance, much of the data collection took place during the high season on Koh Lipe and several research participants expressed they were too busy to participate beyond semi-structured interviews. A lack of interest also prevented greater participation in photo elicitation. For instance, I learned that in the months before my arrival on Koh Lipe, another research group had asked the local school children to take pictures of a similar nature. For this reason, some participants expressed that a photo elicitation study had already been done on the island and therefore, they were not interested in participating or attending the community photo exhibit that I originally intended to host to display participant-submitted pictures.

Despite these situational limitations, it is my belief that low participation in the photo elicitation portion of the project can be attributed to several errors made on my part as the researcher. For instance, after learning of the photo elicitation project that had very recently been carried out with the local school children on Koh Lipe and that participants were not interested in the photo exhibit I originally intended to host, I cancelled the photo exhibit. Consequently, this made me feel that my own photo elicitation study lacked value and I admittedly lost enthusiasm and momentum for that portion of the project. It is possible that subsequent research participants could sense this lack of enthusiasm when I requested their extended participation in photo elicitation. The photo elicitation portion of the project was further complicated when the cameras that I intended to distribute to participants did not function properly and related data collection consequently depended on participants owning or borrowing cameras themselves. Though most

participants owned cameras, or even cell phones capable of taking pictures, I felt as if I was asking too much from my participants to use their personal cell phones, especially if I had only just met them. This researcher error could have been prevented had I entered the field with more preparation and confidence in my own research.

Lastly, there are several ways in which I, the researcher and instrument of qualitative inquiry, may have limited the results of this study. First, my appearance and background as a white female from Canada may have influenced the data. It is possible that a “halo effect” was created and research participants altered their responses by answering questions based on what they thought was “right” or what I wanted to hear, as a westerner who visited Koh Lipe specifically to discuss marine conservation issues (Patton, 1999, p. 1202). Similarly, my own background, predispositions, or biases may also have influenced the results of the study during interpretation or analysis of the data (Patton, 1999). Though I could not control how my presence as a researcher affected the results, or how my own background influenced interpretation of the data, I aimed to reduce these limitations by maintaining neutrality, an open mind, and understanding during interviews (and also encouraging my three translators to do the same) and ensuring to cross-check the data with other sources and data collection methods during data collection and analysis.

On that note, my lack of knowledge of the Thai language was also a limitation to this study. In total, three Thai people were employed to assist with interview translation; however, they were only available on certain days, or at certain times. Therefore, the absence of a reliable translator on each day of the field study could have prevented me from recruiting participants that expanded beyond the circle of tour guides, conservation groups, and fishers who were relatively easy to communicate with. I tried very hard to learn the Thai language and reduce this limitation, but it was very difficult to learn in such a short amount of time.

Finally, the results may also have been limited from my own personal feelings of culture shock, fear, loneliness, insecurity, and generally being an outsider, which resulted simply from living in a foreign country. It is possible these feelings affected the consistency of data collection. For instance, on a particularly long day of participant observation, I returned to my residence to find it had been broken into, with several personal items and money stolen. Several days later, my residence was broken into again. Evidently, I had been targeted along with several other tourists staying in that area. I also struggled to maintain healthy for the duration of the field study and required several visits to the healthcare facility. To reduce study limitations related to my personal well-being, I consistently wrote in a personal journal, worked hard to learn the Thai language, developed friendships with local Thai people and took several breaks from the field environment.

6.8: Conclusion

This case study has described the social and environmental changes incurred from the creation of a national marine park and introduction of mass tourism on the island of Koh Lipe. The population of local, indigenous Chao Ley people, who have lived in the Adang Archipelago since 1909, have experienced many changes related to newcomers arriving on the island including displacement, restriction of movement, changes in traditional ways of life (including new livelihood opportunities), and increased competition for natural resources. Research participants reported that since tourism began on Koh Lipe, they have observed reduced coral cover, reduced fish catch, and increased pollution on the island and in the sea. Participants attribute these environmental changes to uncontrolled infrastructure development on Koh Lipe, overfishing and negative fishing practices, and various tourist activities. These issues persist despite the presence of a National Marine Park greater than 1500 km². A number of local institutions have emerged on Koh Lipe, including those that can be categorized as community-based conservation and co-management, which aim to address priority environmental issues. Despite these great efforts, the

effectiveness of conservation regimes and involvement of local people in natural resource management are limited by a variety of factors including a lack of strong government support, local leadership, shared conservation goals, and strong vertical/horizontal relationships. The findings from this study have five implications for management of the marine environment that may help to improve biodiversity conservation, link biodiversity conservation with local livelihoods, and improve the sustainability of this important marine resource:

1. The social capital on Koh Lipe should be strengthened
2. Community participation in planning and implementation of coral reef management should be encouraged.
3. The snorkeling and SCUBA diving industries can be used as incentives for improving coral reef protection and providing sustainable livelihood opportunities
4. An ecological monitoring program should be initiated to document the health of coral reefs in Tarutao National Park
5. The capacity of the government staff managing Tarutao National Park should be improved.

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Appendix I

Semi-Structured Interview Questions

Part I. Interview questions for local Chao Ley people of Koh Lipe

Personal History of Participants

1. What is your age range (18-25, 26-50, 50+) and primary occupation?
2. Have you always lived on Koh Lipe? If no, where else have you lived?
3. Has your occupation changed during your time living on Koh Lipe?
4. Do your parents currently live on Koh Lipe? What do they do for employment?

Environmental Issues and Conservation

5. How has the island of Koh Lipe changed over the course of your time here?
6. Can you notice an impact on the environment since recent developments for tourism?
7. Do you believe that any activities on Koh Lipe are harming the environment? If yes, which activities in particular and how are they impacting the environment?
8. In your opinion, what do you think has the biggest impact on the environment in Koh Lipe?
9. Do you think environmental conservation is important? Why?
10. Are you aware of any establishments or community groups that are leading activities aimed at conserving the environment? If so, do you think these groups are having a meaningful impact?
11. Do you contribute to or participate in local conservation activities?
12. Do you contribute to environmental conservation on Koh Lipe in other ways?
13. Do you wish there were more conservation activities for the community to participate in together? If yes, what would you like to see?
14. Do you believe the tourists that visit Koh Lipe are environmentally friendly?
15. Do you think the community of Koh Lipe should be doing more to encourage tourists to act more environmentally friendly? If so, how?
16. Do you wish there were more conservation activities for tourists to participate in on Koh Lipe? If yes, what kinds of conservation activities would you like to see?

Motivations and Drivers

17. What aspects of the environment do you personally value? Why?
18. Are the things you value in the environment related to your spiritual beliefs, your livelihood, both or something else?
19. Is environmental conservation a new concept for Chao Ley people? If no, explain.
20. Did your mother or father ever teach you things about using resources? For example, how to fish, how many fish to catch, what kinds of fish to catch, or how to farm, etc.
21. What would make you more interested and/or more willing to participate in conservation activities?
22. Is there anything that would make you feel excited to participate in conservation activities?

Conclusion

23. In this interview, I have been trying to understand the environmental issues on Koh Lipe, the conservation activities now in place, and what would make you more interested in participating in conservation activities. Is there anything important that I missed or a question that I should have asked you?

Part II. Interview questions for foreign residents of Koh Lipe

Personal History of Participants

1. What is your age range (18-25, 26-50, 50+) and primary occupation?
2. Where do you come from originally?
3. Why did you choose to come to Koh Lipe?
4. Has your occupation changed during your time living on Koh Lipe?

Environmental Issues and Conservation

5. How has the island of Koh Lipe changed over the course of your time here?
6. Can you notice an impact on the environment since recent developments for tourism?
7. Do you believe that any activities on Koh Lipe are putting the environment at risk? If yes, which activities in particular and how are they impacting the environment?
8. In your opinion, what do you think has the biggest impact on the environment in Koh Lipe?
9. Do you think environmental conservation is important? Why?
10. Are you aware of any establishments or community groups that are leading environmental conservation activities? If so, do you think these groups are having a meaningful impact?
11. Do you or your establishment contribute to or participate in local conservation activities?
12. Do you or your establishment contribute to environmental conservation on Koh Lipe in other ways?
13. Do you wish there were more conservation activities for the community to participate in together? If yes, what would you like to see?
14. Do you believe the tourists that visit Koh Lipe are environmentally friendly?
15. Do you think the community of Koh Lipe should be doing more to encourage tourists to act more environmentally friendly? If so, how?
16. Do you wish there were more conservation activities for tourists to participate in on Koh Lipe? If yes, what kinds of conservation activities would you like to see?

Motivations and Drivers

17. What aspects of the environment do you personally value and why?
18. Are the things you value in the environment related to your spiritual beliefs, your livelihood, both or something else?
19. What would make you more interested and/or more willing to participate in conservation activities?
20. Is there anything that would make you feel excited to participate in conservation activities?

Conclusion

21. In this interview, I have been trying to understand the environmental issues on Koh Lipe, the conservation activities now in place, and what would make you more interested in participating in conservation activities. Is]Thai permanent residents

Appendix II

Semi-Structured Interview Questions for Photo Elicitation

Select five photographs that you would like to share.

1. To which prompt does this picture correspond?
2. Please describe what you have taken a picture of.
3. Where was this picture taken?
4. Why did you take this picture?
5. Was there anything you wanted to, but were unable to take a picture of?

Appendix III

Participant Consent Forms



UNIVERSITY
OF MANITOBA

**Natural Resources Institute
Clayton H. Riddell Faculty of
Environment, Earth, and Resources**

303 – 70A Dysart Road
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Ecotourism and Community-Based Conservation: Drivers and Motivations in Koh Lipe, Thailand Consent for Semi-Structured Interviews

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Distinguished Professor/Canada Research Chair
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This consent form, a copy of which will be left with you for your records and reference, is only a part of the process of informed consent. It should give you a basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Project Summary: This project is being conducted as a part of my Master's degree in Natural Resource Management at the University of Manitoba. The purpose of this research project is to understand local environmental conservation issues and, if desired by the community, work with local community members to improve conservation activities on Koh Lipe. The researcher will aim to identify environmental conservation issues, determine the motivations and drivers for environmental conservation, including ecotourism activities such as SCUBA diving, and understand how conservation can be improved at the community level. By exploring the potential of community-based conservation and ecotourism on Koh Lipe, this study will contribute to the growing body of information concerning the role of communities in conservation.

Research Timeline: Data collection (active participant observation, interviews and photo elicitation) will be carried out between January and May, 2016.

Nature of Participation: As a research participant, you will be involved in individual semi-structured interviews. The interview will be in person and take approximately one hour. Participation in this interview is voluntary and no economic compensation will be provided. You may decline to answer any

questions and/or withdraw from the study at any time without any loss or negative consequences. I will request that you permit me to digitally record our conversation for the process of data analysis, but if you object, I will transcribe it by hand. Immediately after the interview, you will be debriefed, in which the researcher will verbally summarize the information you have provided. The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

Data Gathering and Storage: Interviews will be documented through note taking and the use of a digital recording device. All recordings, notes and transcripts will be stored in password protected computer files and any hard copies will be stored in a locked cabinet. No digital recording devices will be used or photographs taken during interviews without written consent from you the participants involved in the interview session.

Confidentiality: I will keep any information gathered in this research strictly confidential. All data will be identified only by code number with the code key stored separately to ensure no direct linkage can be made between individuals and the raw data. Data will be kept in a locked cabinet. Confidential personal information will be stored in password protected electronic files and destroyed (permanently deleted) no later than December 31, 2016. Only my advisor and I will have access to the data. You will not be named or identifiable in any reports of this study. If any statement you made during this interview is used in a research report it will be attributed to an anonymous source, unless you request otherwise. Full masking, however, may not be possible. Others may speculate or make inferences as to the identity of research participants and who said what.

Risk and Benefits: This research does not present any risks to participants or third parties beyond that experienced in day-to-day life. The possible benefits of your participation in this research include increased awareness and discussion of environmental issues, increased positive interaction between community members, increased local conservation activities, improved livelihoods and a reduced impact on the natural environment. No information will be used in a way that puts your integrity or safety at risk. It is possible the interview questions will evoke negative emotions related to environmental issues or stressful memories. If this occurs, you may skip a question without negative consequences and/or withdraw participation at any time.

Feedback and Dissemination: Results from this research will be disseminated at academic conferences, by publication in academic journals and a Master's thesis. A brief summary of the results (1-3 pages) will be made available to organizations and community members that request them by December, 2016. Please indicate how you wish to receive this summary:

- ☐ sent to e-mail address: _____.
- ☐ sent through regular mail to the following address: _____.
- ☐ sent to a community organization: _____.
- ☐ not interested in receiving the summary of results.

Consent: Please indicate the following

Yes /No	1. I agree that the researcher may use a digital recording device during this interview.
Yes /No	2. I agree that the researcher may cite my name and directly quote me in future publications. I understand that as a result it will be possible for others to recognize me. (Please, feel free to answer this item at the end of the interview)

Yes /No	3. I agree that the researcher may directly quote me using pseudonym rather than my real name (Please feel free to answer this item at the end of the interview)
Yes /No	4. I agree that photographs of myself taken during my participation in this study may be taken and used in presentations, reports and publications connected to this research.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and/or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

Participant's Signature

Date

Researcher's Signature

Date

This research has been approved by the Joint-Faculty Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator at the University of Manitoba at humanethics@umanitoba.ca. A copy of this consent form has been given to you to keep for your records and reference.

**Ecotourism and Community-Based Conservation: Drivers and Motivations in Koh Lipe, Thailand
Consent for Photo Elicitation**

Principal Investigator:
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Research Supervisor:
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Project Summary: This project is being conducted as a part of my Master's degree in Natural Resource Management at the University of Manitoba. The purpose of this research project is to understand local environmental conservation issues and, if desired by the community, work with local community members to improve conservation activities on Koh Lipe. The researcher will aim to identify environmental conservation issues, determine the motivations and drivers for environmental conservation, including ecotourism activities such as SCUBA diving, and understand how conservation can be improved at the community level. By exploring the potential of community-based conservation and ecotourism on Koh Lipe, this study will contribute to the growing body of information concerning the role of communities in conservation.

Research Timeline: Data collection (active participant observation, interviews and photo elicitation) will be carried out between January and May, 2016.

Nature of Participation: As a research participant, you will be involved in the photo elicitation portion of this project. Participation in photo elicitation is voluntary and no economic compensation will be provided. The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

If you choose to take part, you will be asked to photograph:

- a) Things you consider to be environmental issues
- b) Aspects of the environment or places around Koh Lipe that you personally value
- c) Places or things that inspire you to conserve the environment

d) Conservation activities that you have observed or participate in personally

You may use your own camera or, a waterproof, disposable camera provided to you by the researcher. Following a verbal description of the study and guidelines, you will be asked to take 10 photographs. You will have a maximum of two weeks to take the photographs. Once you have finished taking photographs, you can contact me to schedule a time for camera pick up. A semi-structured interview (approximately 1 hour) will be conducted with you to provide you with a copy of the photographs and to discuss the meaning or importance of your pictures. I will request that you permit me to digitally record our conversation for the process of data analysis, but if you object, I will transcribe it by hand. You may decline to answer any questions and/or withdraw from the study at any time without any loss or negative consequences. Immediately after the interview, you will be debriefed, in which the researcher will verbally summarize the information you have provided.

Data Gathering and Storage: Your photographs will be collected by the researcher and stored in a private, password protected computer. The photographs will not be used for purposes other than photo elicitation without consent from you. Interviews will be documented through note taking and the use of a digital recording device. All recordings, notes and transcripts will be stored in password protected computer files and any hard copies will be stored in a locked cabinet. No digital recording devices will be used or photographs taken during interviews without written consent from you the participants involved in the interview session.

Confidentiality: I will keep any information gathered in this research strictly confidential. All data will be identified only by code number with the code key stored separately to ensure to direct linkage can be made between individuals and the raw data. Data will be kept in a locked cabinet or password protected computer. Confidential personal information will be stored in password protected electronic files and destroyed (permanently deleted) no later than December 31, 2016. Only my advisor and I will have access to the data. You will not be named or identifiable in any reports of this study. Full masking, however, may not be possible. Others may speculate or make inferences as to the identity of research participants and who said what.

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Feedback and Dissemination: Results from this research will be disseminated at academic conferences, by publication in academic journals and a Master's thesis. A brief summary of the results (1-3 pages) will be made available to organizations and community members that request them by December, 2016. Please indicate how you wish to receive this summary:

- ☐ sent to e-mail address: _____.
- ☐ sent through regular mail to the following address: _____.
- ☐ sent to a community organization: _____.
- ☐ not interested in receiving the summary of results.

Consent: Please indicate the following

Yes /No	1. I agree that photographs I have taken during my participation in this study may be taken and used in future presentations, reports and/or publications connected to this research.
Yes /No	2. I agree that the researcher may associate my name with photographs I have taken in future presentations, reports and/or publications. I understand that as a result it will be possible for others to recognize me.
Yes /No	3. I agree that the researcher may associate my pseudonym, rather than my real name, with photographs I have taken in reports, presentations or publications.
Yes /No	4. I agree that the researcher may use a digital recording device during the photo elicitation interview.
Yes /No	5. I agree that the researcher may cite my name and directly quote me in future publications. I understand that as a result it will be possible for others to recognize me.
Yes /No	6. I agree that the researcher may directly quote me using pseudonym, rather than my real name in future presentations, reports and/or publications connected to this research.
Yes /No	7. I agree that photographs taken of myself during my participation in this study may be used in future presentations, reports and publications connected to this research.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and/or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

Participant's Signature

Date

Researcher's Signature

Date

This research has been approved by the Joint-Faculty Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator at the University of Manitoba at humanethics@umanitoba.ca. A copy of this consent form has been given to you to keep for your records and reference.

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การท่องเที่ยวเชิงนิเวศและการอนุรักษ์ชุมชน
การขับเคลื่อนและแรงจูงใจของชาวบ้านในเกาะหลีเป๊ะ,
ประเทศไทยการยินยอมในให้การสัมภาษณ์โครงการวิจัย

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เอกสารฉบับนี้เป็นสำเนาที่ใช้ในการบันทึกและการอ้างอิงของท่านนี้เป็นเพียงส่วนหนึ่งของกระบวนการวิจัยที่จะได้รับความยินยอมจากท่านแบบฟอร์มนี้จะให้ความรู้พื้นฐานเกี่ยวกับสิ่งที่ข้าพเจ้าจะทำการวิจัยและการมีส่วนร่วมของท่านในการศึกษาโครงการครั้งนี้หากท่านต้องการรายละเอียดเพิ่มเติมเกี่ยวกับสิ่งที่ได้กล่าวมาหรือข้อมูลที่ไม่ได้ระบุอยู่ที่นี่ท่านสามารถสอบถามเพิ่มเติมได้ทุกเมื่อโปรดใช้เวลาในการอ่านอย่างรอบคอบและทำความเข้าใจข้อมูลประกอบการตัดสินใจ

บทคัดย่อ:

โครงการนี้เป็นส่วนหนึ่งของการศึกษาระดับปริญญาโทของข้าพเจ้าในคณะกรรมการจัดการทรัพยากรธรรมชาติที่มหาวิทยาลัยแมนิโทบา ประเทศแคนาดา วัตถุประสงค์ของโครงการวิจัยนี้คือการเข้าใจถึงปัญหาการอนุรักษ์สิ่งแวดล้อมในท้องถิ่นและการทำงานร่วมกับสมาชิกในชุมชนท้องถิ่นเพื่อปรับปรุงกิจกรรมการอนุรักษ์ทรัพยากรบนเกาะหลีเป๊ะ ข้าพเจ้ามีจุดมุ่งหมายในการระบุปัญหาการอนุรักษ์สิ่งแวดล้อม การสร้างแรงจูงใจในการขับเคลื่อนเพื่อการอนุรักษ์สิ่งแวดล้อม รวมทั้งกิจกรรมการท่องเที่ยวเชิงนิเวศเช่นดำน้ำลึกและเข้าใจวิธีการที่จะทำให้การอนุรักษ์ได้ผลดีขึ้นในระดับชุมชนโดยการสำรวจศักยภาพของการอนุรักษ์ชุมชนและการท่องเที่ยวเชิงนิเวศบนเกาะในการศึกษาครั้งนี้จะส่งผลให้มีข้อมูลเพิ่มเติมในด้านบทบาทของชุมชนเชิงอนุรักษ์

ระยะเวลา: การเก็บรวบรวมข้อมูล (สังเกตผู้มีส่วนร่วมในการสัมภาษณ์และการเก็บภาพ)
จะดำเนินการระหว่างเดือนมกราคม 2559 ถึงเดือนพฤษภาคม 2559.(เวลา 5 เดือน)

ลักษณะการเก็บข้อมูล:

ในฐานะที่เป็นผู้เข้าร่วมการวิจัยท่านจะมีส่วนร่วมในการสัมภาษณ์โครงการวิจัย

การสัมภาษณ์ของแต่ละบุคคลจะใช้เวลาประมาณหนึ่งชั่วโมง

การมีส่วนร่วมในการสัมภาษณ์ครั้งนี้เป็นความสมัครใจและไม่มีผลตอบแทนใดๆทั้งสิ้นท่านสามารถปฏิเสธที่จะตอบคำถามหรือถอนตัวออกจากการให้สัมภาษณ์ได้ตลอดเวลาโดยไม่สูญเสียหรือส่งผลกระทบต่อเชิงลบ

ข้าพเจ้าจะขออนุญาตใช้กล้องดิจิทัลเพื่อบันทึกการสนทนาของเราและนำไปใช้ในขั้นตอนของการวิเคราะห์ข้อมูลต่อไปแต่ถ้าท่านคัดค้านข้าพเจ้าจะคัดลอกด้วยลายมือแทนหลังจากการสัมภาษณ์ผู้วิจัยจะสรุปข้อมูลที่ได้จากท่านให้กับมหาวิทยาลัยแมนิโทบาและมหาวิทยาลัยอาจจะดูบันทึกการวิจัยว่าได้ทำการสัมภาษณ์ด้วยกระบวนการที่ปลอดภัยและเหมาะสมหรือไม่.

การรวบรวมข้อมูลและการจัดเก็บ:

การสัมภาษณ์จะถูกบันทึกผ่านการจัดบันทึกและการใช้อุปกรณ์บันทึกดิจิทัล

บันทึกทั้งหมดไม่ว่าจะเป็นสมุดบันทึกและสำเนาจะถูกเก็บไว้ในไฟล์คอมพิวเตอร์ซึ่งมีรหัสผ่านและสำเนาเอกสารจะถูกเก็บไว้ในตู้ล็อกอีกที

ไม่มีอุปกรณ์บันทึกดิจิทัลหรือกล้องถ่ายภาพถูกใช้ในระหว่างการสัมภาษณ์โดยไม่ได้รับความยินยอมเป็นลายลักษณ์อักษรจากผู้เข้าร่วมในการสัมภาษณ์เสียก่อน.

การจัดเก็บข้อมูลสำคัญ:

ข้าพเจ้าจะเก็บรวบรวมข้อมูลที่ได้จากงานวิจัยนี้เป็นความลับอย่างเคร่งครัดข้อมูลทั้งหมดจะถูกระบุโดยรหัสหมายเลขและรหัสกุญแจที่จัดเก็บแยกต่างหากเพื่อให้แน่ใจว่าการเชื่อมโยงข้อมูลสามารถทำได้โดยตรงระหว่างบุคคลและฐานข้อมูลดิบ

ข้อมูลจะถูกเก็บไว้ในตู้ล็อก

ข้อมูลส่วนบุคคลที่เป็นความลับจะถูกเก็บไว้ในไฟล์อิเล็กทรอนิกส์ที่มีรหัสผ่านป้องกันและข้อมูลจะถูกทำลาย (ลบอย่างถาวร) ไม่เกิน 31 ธันวาคม 2016 มีเพียง

ข้าพเจ้าและที่ปรึกษาของข้าพเจ้าเท่านั้นที่จะสามารถเข้าถึงข้อมูลเหล่านี้ได้

คำบอกเล่าใดๆที่ท่านได้กระทำในระหว่างการสัมภาษณ์จะไม่มีชื่อของท่านหรือการระบุตัวตนของท่านในรายงานใดๆ จากการศึกษาครั้งนี้ นอกเสียจากท่านประสงค์จะออกนาม

ความเสี่ยงและประโยชน์:

การวิจัยครั้งนี้ไม่ได้มีความเสี่ยงใดๆ

ต่อผู้ที่มีส่วนร่วมในการวิจัยหรือบุคคลที่สาม

ผลประโยชน์ของการมีส่วนร่วมในการวิจัยคือการรับรู้และการอภิปรายปัญหาของสิ่งแวดล้อมที่เพิ่มขึ้น, ปฏิสัมพันธ์เชิงบวกระหว่างสมาชิกในชุมชน, กิจกรรมอนุรักษ์ท้องถิ่น,

วิถีชีวิตที่ดีขึ้นและลดผลกระทบต่อสภาพแวดล้อมทางธรรมชาติ

และจะไม่มีข้อมูลใดๆจากท่านถูกนำไปใช้ในทางเสีย

มีความเป็นไปได้ที่คำถามในการสัมภาษณ์จะทำให้ท่านเกิดอคติหรือความเครียดหากเกิดกรณีนี้ท่านสามารถข้ามคำถามไปได้โดยที่ไม่มีผลกระทบใดๆหรือท่านสามารถถอนตัวจากการมีส่วนร่วมได้ตลอดเวลา

ข้อเสนอแนะและการเผยแพร่:

ผลลัพธ์ที่ได้จากการวิจัยครั้งนี้จะได้รับการเผยแพร่ในการประชุมทางวิชาการโดยการตีพิมพ์ในวารสารทางวิชาการและวิทยานิพนธ์ปริญญาโท จะมีการสรุปผลโดยย่อ (1-3 หน้า) และจะให้บริการแก่องค์กรและสมาชิกในชุมชนที่พวกเขาได้ขอไว้ในเดือนธันวาคม 2016 ทั้งนี้กรุณาระบุวิธีการที่ท่านต้องการที่จะได้รับบทสรุปนี้:

☐ ส่งไปยังที่อยู่ E-mail:

☐ ส่งผ่านทางไปรษณีย์ปกติไปยังที่อยู่ดังต่อไปนี้:

☐ ส่งไปยังองค์กรในชุมชน

☐ ไม่สนใจในการรับสรุปผล

ความยินยอม: โปรดระบุดังต่อไปนี้

ใช่ / ไม่ใช่	1. ข้าพเจ้ายินยอมให้นักวิจัยใช้อุปกรณ์บันทึกภาพในระหว่างการสัมภาษณ์ครั้งนี้
ใช่ / ไม่ใช่	2. ข้าพเจ้ายินยอมให้นักวิจัยอ้างนามของข้าพเจ้าและคำพูดของข้าพเจ้าในสื่อสิ่งพิมพ์ในอนาคต เพราะมันอาจจะเป็นผลดีที่ทำให้ผู้อื่นรู้จักข้าพเจ้า (กรุณายาลงเลขที่จะตอบคำถามนี้ในตอนท้ายของการสัมภาษณ์)
ใช่ / ไม่ใช่	3. ข้าพเจ้ายินยอมให้นักวิจัยใช้นามแฝงแทนชื่อจริงของข้าพเจ้า (กรุณายาลงเลขที่จะตอบคำถามนี้ในตอนท้ายของการสัมภาษณ์)
ใช่ / ไม่ใช่	4. ข้าพเจ้ายินยอมให้ถ่ายภาพของข้าพเจ้าขณะให้การสัมภาษณ์และใช้ในการนำเสนอรายงานและสิ่งพิมพ์ที่เกี่ยวข้องกับงานวิจัยนี้

ลายเซ็นของท่านในแบบฟอร์มนี้แสดงให้เห็นว่าท่านมีความเข้าใจและพึงพอใจเกี่ยวกับข้อมูลการมีส่วนร่วมในโครงการวิจัยและตกลงที่จะเข้าร่วมในโครงการนี้
ท่านมีอิสระที่จะถอนตัวออกจากการศึกษาวิจัยนี้ในตลอดเวลาและสามารถละเว้นการตอบคำถามใด ๆ ที่ท่านต้องการที่จะละเว้น โดยปราศจากผลที่ตามมา
ท่านสามารถขอคำแนะนำชี้แจงหรือข้อมูลใหม่ตลอดระยะเวลาการสัมภาษณ์ของท่าน

ผู้ให้สัมภาษณ์:

วันที่:

งานวิจัยนี้ได้รับการอนุมัติจากคณะกรรมการจริยธรรมการวิจัย หากท่านมีความกังวลใด ๆ หรือข้อร้องเรียนเกี่ยวกับโครงการนี้ท่านสามารถติดต่อบุคคลดังกล่าวหรือผู้ประสานงานจริยธรรมมนุษยที่มหาวิทยาลัยแมนิโทบาโทร หรือส่งอีเมลล์มาที่ humanethics@umanitoba.ca
สำเนาใบยินยอมนี้ได้รับมอบให้ท่านเก็บไว้เป็นหลักฐานและการอ้างอิงของท่าน.

ผู้ทำการวิจัย:

วันที่:



สถาบันทรัพยากรธรรมชาติ
เคลย์ตันเอชริดเดลล์
คณะสิ่งแวดล้อม, โลก และทรัพยากร

303 - 70A ถนน Dysart
วินนิเพก, แมนิโทบา
แคนาดา R3T 2N2
สำนักงานทั่วไป
NRI 204 474-9373

การท่องเที่ยวเชิงนิเวศและการอนุรักษ์ชุมชนการขับเคลื่อนและแรงจูงใจ
ของชาวบ้านในเกาะหลีเป๊ะ, ประเทศไทย
การยินยอมในการเก็บภาพเพื่อโครงการวิจัย

ผู้วิจัยหลัก:
Emily Ryall
นักศึกษาปริญญาโท
สถาบันทรัพยากรธรรมชาติ
70 Dysart Rd.
มหาวิทยาลัยแมนิโทบา
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ที่ปรึกษางานวิจัย:
Dr. Fikret Berkes
ศาสตราจารย์/ประธานการวิจัย
ประเทศแคนาดา
สถาบันทรัพยากรธรรมชาติ
70 Dysart Rd.
มหาวิทยาลัยแมนิโทบา
Winnipeg, MB R3N 2T2
fikret.berkes@umanitoba.ca

เอกสารฉบับนี้เป็นสำเนาที่ใช้ในการบันทึกและการอ้างอิงของท่าน
นี่เป็นเพียงส่วนหนึ่งของกระบวนการวิจัยที่จะได้รับความยินยอมจากท่าน
เอกสารนี้จะให้ความรู้พื้นฐานเกี่ยวกับสิ่งที่ข้าพเจ้าจะทำการที่วิจัยและการมีส่วนร่วมของท่านในกา
รโครงการครั้งนี้
หากท่านต้องการรายละเอียดเพิ่มเติมเกี่ยวกับสิ่งที่ได้กล่าวมาหรือข้อมูลที่ไม่ได้ระบุอยู่ที่นี่
ท่านสามารถสอบถามเพิ่มเติมได้ทุกเมื่อ
โปรดใช้เวลาในการอ่านอย่างรอบคอบและทำความเข้าใจข้อมูลประกอบการต่างๆ

บทคัดย่อ:

โครงการนี้เป็นส่วนหนึ่งของการศึกษาระดับปริญญาโทของข้าพเจ้าในคณะกรรมการจัดการทรัพยากร
ธรรมชาติที่มหาวิทยาลัยแมนิโทบา ประเทศแคนาดา
วัตถุประสงค์ของโครงการวิจัยนี้คือการเข้าใจถึงปัญหาการอนุรักษ์สิ่งแวดล้อมในท้องถิ่นและการทำ
งานร่วมกับสมาชิกในชุมชนท้องถิ่นเพื่อปรับปรุงกิจกรรมการอนุรักษ์ทรัพยากรบนเกาะหลีเป๊ะ
ข้าพเจ้ามีจุดมุ่งหมายในการระบุปัญหาการอนุรักษ์สิ่งแวดล้อม
การสร้างแรงจูงใจในการขับเคลื่อนเพื่อการอนุรักษ์สิ่งแวดล้อม
รวมทั้งกิจกรรมการท่องเที่ยวเชิงนิเวศเช่นดำน้ำลึกและเข้าใจวิธีการที่จะทำให้การอนุรักษ์ได้ผลดี
ขึ้นในระดับชุมชนโดยการสำรวจศักยภาพของการอนุรักษ์ชุมชนและการท่องเที่ยวเชิงนิเวศบนเกาะ
ในการศึกษาครั้งนี้จะส่งผลให้มีข้อมูลเพิ่มขึ้นในด้านบทบาทของชุมชนเชิงอนุรักษ์

ระยะเวลา: การเก็บรวบรวมข้อมูล (สังเกตผู้มีส่วนร่วมในการสัมภาษณ์และการเก็บภาพ) จะดำเนินการระหว่างเดือนมกราคม 2559 ถึงเดือนพฤษภาคม 2559. (เวลา 5 เดือน)

ลักษณะการเก็บข้อมูล

:

ในฐานะที่เป็นผู้เข้าร่วมการวิจัยท่านจะมีส่วนร่วมในการถ่ายภาพของโครงการนี้ การมีส่วนร่วมในการถ่ายภาพครั้งนี้เป็นความสมัครใจของท่านจะไม่มีผลตอบแทนใดๆทั้งสิ้น มหาวิทยาลัยแมนิโทบาจะดูบันทึกการวิจัยว่าได้ปฏิบัติโดยกระบวนการที่ปลอดภัยและเหมาะสมหรือไม่

หากท่านเลือกที่จะเป็นส่วนหนึ่งของโครงการนี้ท่านจะถูกขอให้ถ่ายภาพ:

- ก) สิ่งที่ท่านคิดว่าจะเป็นปัญหาด้านสิ่งแวดล้อม.
- ข) ลักษณะของสภาพแวดล้อมหรือสถานที่รอบ ๆ เกะเหลี่เป๊ะที่มีคุณค่าต่อตัวท่าน.
- ค) สถานที่หรือสิ่งที่สร้างแรงบันดาลใจให้ท่านอนุรักษ์สิ่งแวดล้อม.
- ง) กิจกรรมอนุรักษ์ที่ท่านได้สังเกตเห็นหรือได้มีส่วนร่วม.

ท่านอาจจะใช้กล้องกันน้ำของท่านเองหรือกล้องถ่ายภาพของผู้วิจัยก็ได้

ต่อไปนี้เป็นคำอธิบายและแนวทางที่ท่านจะถูกขอให้ปฏิบัติ ท่านต้องถ่ายภาพเป็นจำนวน 10 ภาพ และท่านจะมีเวลาอย่างมากสองสัปดาห์ในการถ่ายภาพ เมื่อท่านเสร็จสิ้นการถ่ายภาพ, ท่านสามารถติดต่อข้าพเจ้าเพื่อกำหนดเวลาสำหรับรับกล้องคืน การสัมภาษณ์โครงการนี้จะใช้เวลา (ประมาณ 1 ชั่วโมง)

ท่านจะได้รับสำเนาภาพและจะหารือกันเกี่ยวกับความหมายหรือความสำคัญของภาพถ่ายเหล่านั้น ข้าพเจ้าจะขออนุญาตจากท่านเพื่อที่จะใช้อุปกรณ์ดิจิทัลในการบันทึกการสนทนาของเราเพื่อนำไปใช้ในขั้นตอนของการวิเคราะห์ข้อมูลต่อไป แต่ถ้าท่านคัดค้านข้าพเจ้าจะคัดลอกด้วยมือ

ท่านสามารถปฏิเสธที่จะตอบคำถามใดๆ

หรือถอนตัวออกจากโครงการนี้ได้ตลอดเวลาโดยไม่สูญเสียหรือส่งผลกระทบต่อ

ทันทีหลังจากการสัมภาษณ์ผู้วิจัยจะสรุปข้อมูลที่ได้จากท่านให้กับมหาวิทยาลัยแมนิโทบา.

การรวบรวมข้อมูลและการจัดเก็บ

:

ภาพถ่ายของท่านจะถูกรวบรวมไว้โดยผู้วิจัยและจัดเก็บไว้ในไฟล์คอมพิวเตอร์ส่วนตัวซึ่งมีรหัสผ่าน ภาพถ่ายจะไม่ถูกใช้เพื่อวัตถุประสงค์อื่นโดยปราศจากความยินยอมจากท่าน

การสัมภาษณ์จะถูกบันทึกผ่านการจดบันทึกและการใช้อุปกรณ์บันทึกดิจิทัล

บันทึกทั้งหมดไม่ว่าจะเป็นสมุดบันทึกและสำเนาจะถูกเก็บไว้ในไฟล์คอมพิวเตอร์ซึ่งมีรหัสผ่านและสำเนาเอกสารจะถูกเก็บไว้ในตู้ล็อกอีกที
ไม่มีอุปกรณ์บันทึกดิจิทัลหรือกล้องถ่ายภาพถูกใช้ในระหว่างการสัมภาษณ์โดยไม่ได้รับความยินยอมเป็นลายลักษณ์อักษรจากผู้เข้าร่วมในการสัมภาษณ์เสียก่อน.

การจัดเก็บข้อมูลสำคัญ

ข้าพเจ้าจะเก็บข้อมูลที่ได้รวบรวมจากงานวิจัยนี้เป็นความลับอย่างเคร่งครัด
ข้อมูลทั้งหมดจะถูกระบุโดยรหัสหมายเลขและรหัสกุญแจที่จัดเก็บแยกต่างหากเพื่อให้แน่ใจว่าการเชื่อมโยงข้อมูลสามารถทำได้โดยตรงระหว่างบุคคลและฐานข้อมูลดิบ ข้อมูลจะถูกเก็บไว้ในตู้ล็อก
ข้อมูลส่วนบุคคลที่เป็นความลับจะถูกเก็บไว้ในไฟล์อิเล็กทรอนิกส์ที่มีรหัสผ่านป้องกันและจะทำลาย
ข้อมูล (ลบอย่างถาวร) ไม่เกิน 31 ธันวาคม 2559
มีเพียงข้าพเจ้าและที่ปรึกษาของข้าพเจ้าเท่านั้นที่จะสามารถเข้าถึงข้อมูลเหล่านี้ได้
จะไม่มีชื่อของท่านหรือการระบุตัวตนของท่านในรายงานใดๆ จากการศึกษาครั้งนี้
นอกเสียจากท่านประสงค์จะออกนาม

ความเสี่ยงและประโยชน์:

การวิจัยครั้งนี้ไม่ได้มีความเสี่ยงใดๆ

ต่อผู้ที่มีส่วนร่วมในการวิจัยหรือบุคคลที่สาม

ผลประโยชน์ของการมีส่วนร่วมในการวิจัยนี้คือการรับรู้และการอภิปรายปัญหาของสิ่งแวดล้อมที่เพิ่ม
มากขึ้น, ปฏิสัมพันธ์เชิงบวกระหว่างสมาชิกในชุมชน,
กิจกรรมอนุรักษ์ท้องถิ่น,วิถีชีวิตที่ดีขึ้นและลดผลกระทบต่อสภาพแวดล้อมทางธรรมชาติ
ไม่มีข้อมูลใดๆจากท่านที่จะถูกนำไปใช้ในทางเสี่ยงหรือไม่ปลอดภัย.

ข้อเสนอแนะและการเผยแพร่:

ผลลัพธ์ที่ได้จากการวิจัยครั้งนี้จะได้รับการเผยแพร่ในการประชุมทางวิชาการโดยการตีพิมพ์ในวารสารทางวิชาการและวิทยานิพนธ์ปริญญาโท สรุปผลโดยย่อ (1-3 หน้า)
จะให้บริการแก่องค์กรและสมาชิกในชุมชนที่พวกเขาได้ขอไว้ในเดือนธันวาคม 2559
ทั้งนี้กรุณาระบุวิธีการที่ท่านต้องการที่จะได้รับบทสรุปนี้:

☐ ส่งไปยังที่อยู่ E-mail:

☐ ส่งผ่านทางไปรษณีย์ปกติไปยังที่อยู่ดังต่อไปนี้:

☐ ส่งไปยังองค์กรในชุมชน

☐ ไม่สนใจในการรับสรุปผล

ความยินยอม: โปรดระบุดังต่อไปนี้

ใช่ / ไม่ใช่	1. ข้าพเจ้ายินยอมให้ใช้ภาพถ่ายที่ข้าพเจ้าได้ถ่ายในขณะที่มีส่วนร่วมในงานวิจัยครั้งนี้ และนำไปใช้ในการนำเสนอผลงาน, รายงานหรือสิ่งพิมพ์ที่เกี่ยวกับงานวิจัยนี้ในอนาคต
ใช่ / ไม่ใช่	2. ข้าพเจ้ายินยอมให้นักวิจัยใช้ชื่อของข้าพเจ้าและภาพของข้าพเจ้าในการนำเสนอผลงาน, รายงานหรือสิ่งพิมพ์ในอนาคต เพราะมันอาจจะเป็นผลดีที่ทำให้ผู้อื่นรู้จักข้าพเจ้า
ใช่ / ไม่ใช่	3. ข้าพเจ้ายินยอมให้นักวิจัยใช้ภาพถ่ายและนามแฝงแทนชื่อจริงของข้าพเจ้าเพื่อนำไปใช้ในรายงาน, การนำเสนอผลงานหรือสิ่งพิมพ์
ใช่ / ไม่ใช่	4. ข้าพเจ้ายินยอมให้นักวิจัยใช้อุปกรณ์บันทึกภาพตลอดการให้สัมภาษณ์
ใช่ / ไม่ใช่	5. ข้าพเจ้ายินยอมให้นักวิจัยอ้างนามของข้าพเจ้าโดยตรงในสื่อสิ่งพิมพ์ในอนาคต เพราะมันอาจจะเป็นผลดีที่ทำให้ผู้อื่นรู้จักข้าพเจ้า
ใช่ / ไม่ใช่	6. ข้าพเจ้ายินยอมให้นักวิจัยกล่าวอ้างนามแฝงมากกว่าชื่อจริงของข้าพเจ้าในการงานนำเสนอผลงาน, รายงานหรือสิ่งพิมพ์ที่เกี่ยวข้องกับงานวิจัยนี้ในอนาคต
ใช่ / ไม่ใช่	7. ข้าพเจ้ายินยอมให้ใช้ภาพถ่ายของตัวเองขณะที่มีส่วนร่วมในการศึกษาครั้งนี้ ไปใช้ในการนำเสนอผลงาน, รายงานและสิ่งพิมพ์ที่เกี่ยวกับงานวิจัยนี้ในอนาคต

ลายเซ็นของท่านในแบบฟอร์มนี้แสดงให้เห็นว่าท่านมีความเข้าใจและพึงพอใจเกี่ยวกับข้อมูลการมีส่วนร่วมในโครงการวิจัยและตกลงที่จะเข้าร่วมในโครงการนี้ท่านมีอิสระที่จะถอนตัวออกจากการศึกษาวิจัยนี้ในตลอดเวลาและสามารถละเว้นคำตอบคำถามใดๆที่ท่านต้องการที่จะละเว้น โดยปราศจากผลที่ตามมาท่านสามารถขอคำแนะนำชี้แจงหรือข้อมูลใหม่ตลอดระยะเวลาการสัมภาษณ์ของท่าน.

ผู้ให้สัมภาษณ์:

ผู้ทำการวิจัย:

งานวิจัยนี้ได้รับการอนุมัติจากคณะกรรมการจริยธรรมการวิจัย หากท่านมีความกังวลใด ๆ หรือข้อร้องเรียนเกี่ยวกับโครงการนี้ท่านสามารถติดต่อบุคคลดังกล่าวหรือผู้ประสานงานจริยธรรมมนุษย์ที่มหาวิทยาลัยแมนิโทบาโทร หรือส่งอีเมลล์มาที่ humanethics@umanitoba.ca
สำเนาใบยินยอมนี้ได้รับมอบให้ท่านเก็บไว้เป็นหลักฐานและการอ้างอิงของท่าน