SYNERGIES FOR STEWARDSHIP AND GOVERNANCE OF MULTIPLE-USE COASTAL AREAS: A CASE STUDY OF KOH CHANG, THAILAND

by

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ABSTRACT

Coastal areas globally support a wide variety of human activities. Tourism, fisheries, and conservation activities, in particular, are often found to coexist, as is the case with the study area, Koh Chang—an island in the Gulf of Thailand. The relationships between these activities are highlighted in this study as areas to investigate the potential for synergy among coastal stakeholders. Positive and compatible relationships are considered conducive to synergy formation, yet are often overshadowed by those that are negative or conflicting. This study argues that synergy at the local level can represent an important consideration for capacity and strength within a social system, which, in turn, can better inform context-appropriate strategies for integrated coastal management and enhance environmental stewardship behaviour. This thesis offers an innovative and exploratory approach, informed by the interactive governance framework, to study synergy among coastal stakeholders.

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DEDICATION

This thesis is dedicated to my amazing Father, David Francis
For peaking my interest in writing and always being eager to help

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Au-Bor-Tor- Tambon Administrative Organization

CBD- Convention of Biological Diversity

DASTA- Designated Areas for Sustainable Tourism Administration

DoF- Department of Fisheries

GT- Gross Tonnage

ICM- Integrated Coastal Management

MKCNP- Mu Koh Chang National Park

MPA- Marine Protected Area

NGO- Non-Governmental Organization

UNEP-GEF- United Nations Environmental Programme-Global Environmental Facility

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Chapter One

Introduction

This chapter introduces the thesis, beginning with an overview of the socio-ecological importance and complexity of multiple-use coastal areas, with specific reference to relationships among stakeholders from tourism, fisheries, and conservation. The problem description draws attention to the adverse outcomes management arrangements can have when they fail to adequately account for social and ecological complexities. In particular, there is a tendency for management strategies to focus on conflicts among stakeholders and their negative impacts rather than their strengths and capacities. Instead of trying to keep activities separate, this study aims to explore potential for synergistic relations among coastal stakeholders. The interactive governance perspective—this study's conceptual framework—is introduced as an approach to study potential for synergy among stakeholders based upon relationships. This study specifically elaborates on the concept of synergy and discusses its conduciveness to environmental stewardship and applicability to integrated coastal management (ICM). Next, the specific research questions this thesis seeks to address are presented. An overview of the thesis concludes this chapter with a short synopsis of each chapter.

1.1 Complexity in multiple-use coastal areas and the wicked governance problem

Coastal areas represent one of the most complex multiple-use areas in the world (Griffis & Kimball, 1996; Schlüter et al., 2013). They are comprised of diverse, complex, and dynamic ecosystems of high ecological and anthropogenic value (Chuenpagdee et al.,

2008). Essential for the maintenance of biodiversity and the provision of ecosystem services, coastal zones provide vital habitats and nurseries for many fisheries of global significance as well as a wide variety of societal and economic activities (Lopes et al., 2015). At a global scale, coastal areas are being degraded as a result of many human-related pressures, including destructive fishing gears and fisheries overexploitation, coastal development, land and marine-based pollution, and poor tourism practices. In consequence, dwindling or extinction of fish stocks, declining biodiversity, coastal erosion, polluted waters, and habitat fragmentation are just a few examples of known impacts, which threaten the future for healthy ecosystems and sustainable livelihoods of coastal communities (Gray, 1997; Feeley et al., 2008).

Multiple coastal uses often bring conflicts among stakeholders and degradation of ecosystems, especially when interests compete for space, access, and resources. This scenario, wherein conflicts provide a basis for inquiry, has been a prominent focus of scholarly research on coastal and marine conservation (Pomeroy et al., 2014). The implication of such a basis is that it is the antagonistic relations, among people as well as people and the environment, that inform the design and implementation of management schemes.

Represented by a wide body of literature, strategies such as multiple-use zoning, marine protected areas (MPAs), as well as an assortment of rules, regulations, and restrictions, have been promoted as means to mitigate user impacts. All of these approaches exemplify management strategies, or interventions, in which their application

seeks to control users' access, activities, and interactions with one another (McClanahan, 2011; Jentoft, 2007). In the face of the widespread environmental degradation of coastal zones, compounded by the dire anticipated impacts and uncertainties associated with climate change and increased coastal populations, the implementation of such management strategies may seem intuitive and even imperative. However, many of the aforementioned management strategies have proved to be ineffectual in the fulfillment of their intended goals for sustainable resource use (Degnbol et al., 2006).

The limited success of management strategies in attaining their respective goals is suggested by Jentoft and Chuenpagdee (2009) to be a result of applying standardized solutions to problems that are too often portrayed as benign and simple. In actuality, issues linked to resource management, or societal problems in general, are inherently complex—or wicked. As first described by Rittel and Webber (1973), Jentoft and Chuenpagdee (2009) invoke the concept of wicked problems to explain the challenges associated with management strategies. Wicked problems are problems that are multifaceted and difficult to define. Subject to many known and unknown factors and influences, wicked problems cannot easily be remedied with a single solution. In many cases, they are ongoing and ever changing, and thereby warrant long-term attention and reassessment.

Management strategies for sustainable resources and communities are largely dependent upon held images of the problem at hand (Jentoft et al., 2010). Images of the problem and selection of a managerial approach often hinge upon the prevailing theory

situated within different disciplinary discourses. Degnbol et al., (2006), for example, associate MPAs, community-based management, and individual transferable quotas to be interventions rooted in the respective fields of biology, sociology, and economics. In the case of MPAs, biologists and ecologists concerned with conservation broadly identify human interference as the root cause of biodiversity and habitat loss and thus support a spatial intervention that restricts or prohibits human interaction with coastal and marine environments (Degnbol et al., 2006). In line with this perspective, MPAs have been widely advocated as a means to curtail imminent biodiversity loss of marine flora and fauna as demonstrated by the global initiative, led by the Convention of Biological Diversity (CBD), to protect 10% of the world's marine environment by 2020 (CBD, 2010). As of 2014, there is still substantial protection to be gained in order to meet the CBD's target with approximately 3.4% of the world's oceans currently under protection (Juffe-Bignoli et al., 2014).

Interventions, based on images as well as simplified evaluations of a wicked problem, can create unanticipated impacts as livelihoods are embedded within a greater context and are subject to an array of socio-economic and political factors and influences (Jentoft & Chuenpagdee, 2013; Degnbol et al., 2006). Again, in reference to MPAs, a motive for their establishment follows the precedence of their terrestrial counterparts, where social considerations and local expertise were seen as secondary, or an afterthought, rather than of value to achieving conservation goals (Eadens et al., 2009). In most cases, long-term success is contingent upon stakeholder support (Jentoft et al., 2012; Bennett & Dearden, 2014). MPAs have been criticized for creating adverse socio-

economic impacts due to limited stakeholder participation and inadequate consideration for local livelihoods (Agardy et al., 2003; Voyer et al., 2012; Chuenpagdee et al., 2013). MPAs vary in their level of restriction of human activities, with some regulating "no take" areas and others permitting multiple uses. However, additional problems arise when MPAs lead to a disproportionate distribution of benefits, which can also create tension within communities (Oracion et al., 2005; Segi, 2014). For instance, while small-scale fisheries are often seen as a threat to conservation and are excluded from MPAs (Gasalla, 2011), tourism activities are promoted as a lower-impact and revenue-generating alternative (Johnson, 2013). Lack of stakeholder involvement and user inequity, coupled with the limited resources many countries have for monitoring and enforcement, often set the stage for low compliance rates among local stakeholders (Christie, 2004; Bennett & Dearden, 2012).

Social impacts and stakeholder participation for MPAs have become increasingly recognized as important for socio-ecological sustainability. For instance, there are cases of successful MPAs in populous, multiple-use areas (Micheli & Niccolini, 2013). However, the success or failure of MPAs, and any other management strategy, is largely context dependent (Mascia et al., 2010). With this recognition, there is concern for the practicality of establishing successful MPAs under the CBD's proposed protected ocean coverage of 10% by 2020 (Chuenpagdee et al., 2013). MPA creation through political expediency (Jentoft et al., 2007) and 'blind faith' in their conservation potential (Agardy et al., 2011) can lead to the well documented socio-ecological problems alluded to above. Inevitably, wicked problems associated with human-nature interactions are innately

resistant to general, widespread panacea-type approaches (Ostrom, 2007; Jentoft & Chuenpagdee, 2009). Thus, the promotion of reserves without a greater understanding of context-specific socio-economic elements may lead to the proliferation of nothing more than spatial designations without any actual conservation clout, or so-called "paper parks" (Schlüter et al., 2013; Bonham et al., 2008).

Wicked social and environmental problems are commonplace in coastal areas, yet many of the management strategies do not recognize their overall complexity. There is often little emphasis on the quality of stakeholder relations beyond the conflicts between coastal stakeholders and the negative impacts human activities have on the environment. 'Peaceful co-existence' among stakeholders is typically the extent of management aims rather than fostering mutually supportive relationships (Jentoft & Buanes, 2005). Such an emphasis on the adverse qualities of a social system provides a limited view of how stakeholders can participate in governance and address complex problems.

1.2 Research focus

Disagreements and conflicts among different coastal activities may be inevitable. However, when they become the emphasis of research, other interactions and relationships in a system remain unrecognized. The inadequacies of a social system are often the focus of institutions rather than the strengths a system has to offer (McKnight, 1997). Positive or neutral relationships invariably exist at some level and may represent capacity or provide opportunity for addressing complex problems inherent to multiple-use coastal areas. Thus, while the focus in the literature has been on strategies to mitigate

conflicts among stakeholders, this study plans to explore the potential for *synergy*. Synergy represents the positive emergent capabilities individuals and groups have when considered together (Nevo & Wade, 2010). Although synergy is not a unique term within coastal governance literature, it is often used implicitly without forming the objective of analysis. For example, a recent publication by Lopes et al. (2015) speaks to the concept of synergy—in the mutual collaboration of stakeholder groups—without explicitly designing a study that explores how to look at synergy.

The goals of this study are to explore ways to investigate synergy and illustrate how synergy may contribute to improving governance of multiple use coastal areas. There is motivation to study synergy as it may provide insight into the capacity, or latent capacity, among stakeholders. In turn, synergy could help to inform the development of context-appropriate management strategies that not only mitigate conflicts, but also foster capacity. Capacity, in this thesis, refers to the ability of stakeholders to meaningfully engage with one another, specifically in regards to their participation in governance and stewardship activities. Developing management strategies that build upon system strengths at the local stakeholder level may ultimately contribute to multifaceted governance approaches, such as integrated coastal management (ICM) and enhancing environmental stewardship. This thesis offers a novel course of action to study synergy that draws from the interactive governance framework (Kooiman et al., 2008), which provides a lens to study synergy through a systematic approach that recognizes complexity among social actors.

1.3 Interactive governance, governability, and stewardship

Interactive governance offers a holistic perspective to study wicked problems that is both broad in scope and non-prescriptive in nature. It invokes a systems-based approach comprised of three main systems: the governing system, the system-to-be-governed (natural and social components), which are connected by the system of governing interactions (Kooiman, 2008). It is within the system-to-be governed that this study takes place.

Another key component of the framework to this study is the concept of governability. Governability addresses the overall capacity of the governing system to meet the needs of the system-to-be-governed (Kooiman, 2008; Jentoft & Chuenpagdee, 2015). Governability is partly determined by the system properties of diversity, complexity, dynamics, and scale. The thesis focuses on complexity, which is conditioned by relationships between various components in the system. While relationships create complexity in the system that lowers the overall governability (Jentoft & Chuenpagdee, 2009), this study argues that it is within these relationships that synergy can be found. Attention to properties of diversity, dynamics, and scale, however, is also important as they influence how people interact and relate to one another. In other words, important information may be lost when complexity is studied in isolation of the other system properties.

If synergy among stakeholders can be fostered, over the long-term it may enable stewardship behaviour. Environmental stewardship, an ethic-based principle that guides

humans' relationship with nature (Attfield, 2014), can therefore contribute to making the entire system more governable. Environmental stewardship refers to humans' duty to care for nature and use its resources in a responsible manner (Berry, 2006). To describe this relationship, a three-tired model is employed within which humans and nature form the respective second and third tiers (Roach, 2000). The top tier represents the entity to which humans—the stewards—are accountable. From its biblical roots and religious interpretations, this top-tier refers to God while in secular usage it encompasses a broad set of values including values held by members of society, past and future generations, as well as the intrinsic value of nature (Worrell & Appleby, 2000).

1.4 Research statement, questions, and case study

The purpose of this study is to examine the relationships and potential for synergies among various stakeholder activities in order to explore opportunities for governance of coastal resources and environmental stewardship.

Specific questions guiding this study are:

i. What is the nature of relationships among activity groups?

ii. How do activity groups judge each other in terms of their positive and negative impact?

iii. How appropriate is the current governing system?

iv. What are the motivations and awareness for/of environmental stewardship?

The study was conducted in Koh Chang, an island located in the upper eastern Gulf of Thailand (Figure 3.1). The island has undergone many transformations from a

relatively pristine tropical rainforest with resident small-scale fishing and farming communities to being designated with national marine park status and, over the last fifteen years, has been developed as a popular tourist destination. Koh Chang was chosen as an illustrative case study because it is a multiple-use area, with fisheries, tourism and conservation as prominent activities. Such activities are commonly found to co-exist in areas around the world and exemplify groups with different relationships and interactions with the coastal environment. Stakeholder heterogeneity—often with diverse interests and aspirations—increases the overall complexity of the social system (Jentoft et al., 2007). In turn, different uses can lead to issues of incompatibility among stakeholders sharing limited space and resources (Fabinyi, 2008; Johnson, 2013) and negatively impact supporting ecosystems (Thia-Eng, 1993).

However, relationships on Koh Chang also hold potential for mutually supportive interactions. This is evidenced by initiatives to support fishers' participation in conservation efforts, such as mangrove and coral restoration projects (UNEP, 2008) as well as projects that promote sustainability for tourism activities and local fishing livelihoods (DASTA, 2013; Rochanarat, 2007). It is within this local context, among coastal stakeholders, that this study on stakeholder relationships takes place.

1.5 Organization of thesis

After this introductory chapter, the thesis will be comprised of the following six chapters: theoretical background, study area description, methods, results, discussion, and conclusion. Chapter two expands on the key theory and concepts underlying the research

presented in chapter one. It situates this thesis in the theoretical background of ICM and introduces the concept of synergy. Key components of the interactive governance framework are then described, which informed the methodology to study the potential for synergy based on system properties and governing orders. Environmental stewardship is then presented as a potential outcome of synergistic relations among stakeholders. Chapter three introduces the study area: Koh Chang, Thailand. Within this section, contexts of the physical geography, development and human geography are provided. Specific details of tourism, fisheries, and conservation activities are elaborated along with a description of the key governing actors. Chapter four pertains to the methodology and commences with preparatory steps of field observations and preliminary interviews, prior to a detailed account of the main research instrument: a questionnaire survey. Chapter five, the results section, presents a description of coastal activities on the island with particular emphasis on the key findings of the survey. Chapter six provides a discussion of the results and relevant literature as well as methodological limitations and considerations. Finally, chapter seven concludes with a discussion of the study implications and avenues for future research.

Chapter Two

Theoretical Background

Coastal areas are complex systems, with multiple interconnected and interdependent components. Integrated coastal management (ICM) is a governance approach generally considered suitable to deal with this complexity. At the stakeholder level, ICM promotes conflict mitigation and resolution. Stemming from this emphasis, this study posits that there is motivation for greater consideration of synergistic relationships among coastal stakeholders. The concept of synergy is then unpacked in greater detail to discuss its potential utility for coastal governance and applicability for relationships among tourism, fisheries, and conservation activities. Next, interactive governance is presented as the conceptual framework of this study, which informed the guiding research questions and methodological approach. Within the framework, complexity is emphasized as the basis of synergy. The framework's governing orders are then described as a means to study potential for synergy among stakeholders. As a possible outcome of synergy, the concept of environmental stewardship is explored with reference to its historical usage and associated critiques.

2.1 Integrated coastal management approach to address coastal complexity

Coastal areas represent diverse, complex, and dynamic ecological, social, political, and economic environments. With overarching goals of sustainable development and conservation, various approaches have been developed in an effort to address the inherent complexity of coastal areas. Some examples include, but are not

limited to ecosystem-based management (e.g. UNEP, 2011), integrated coastal management (ICM) (e.g. Cicin-Sain & Knecht, 1998), integrated coastal zone management (e.g. Thia-Eng, 1993), complex adaptive systems (e.g. Rammel et al., 2007), and large marine ecosystems (e.g. Fanning et al., 2007; Sherman & Hempel, 2009). Although these examples may differ in their overall approach, inclusiveness, and disciplinary setting, a common theme is that they depart from the conventional reductionist view of sector-by-sector management wherein efficiency and sector-based gains preside over long-term sustainability of coastal uses and ecological viability (Rammel et al., 2007). Instead, they conceptualize coastal areas from a systems-based perspective, comprised of many interacting components that, of themselves, are a part of larger systems and structures (Costanza et al., 1993; Kooiman & Bavinck, 2013). For the purposes of this study, details of ICM are further elaborated as it presents an appropriate frame to ultimately situate the linkages among tourism, fisheries, and conservation stakeholder groups emphasized here.

ICM is not a new concept for coastal governance. It was initially developed in the early 1970s with its current conceptualization originating from the 1992 Earth Summit of Rio de Janeiro (Celliers et al., 2013). In the years following, ICM proliferated across coastal areas globally (Sorenson, 1997; Feeley et al., 2008). ICM appears differently from a case-to-case basis, as implementation must be tailored to the unique characteristics of each context (Wongthong & Harvey, 2014). However, a common definition put forth by Cicin-Sain and Knecht (1998, p.1) illustrates the main goal of the framework:

> "ICM is a process by which rational decisions are made concerning the conservation and sustainable use of coastal and ocean resources and space. The process is designed to overcome the fragmentation inherent in single-sector management approaches (fishing operations, oil and gas development, etc.), in the splits in jurisdiction among different levels of government, and in the land-water interface."

Many tools are utilized under the ICM approach, including MPAs, marine zoning, permits, fisheries management, conflict resolution, and planning (Christie et al., 2005). As with each of these tools, the successful implementation and long-term sustainability of ICM projects have also been met with challenges. This is due, in part, to the difficulty of coordinating among the various governing agencies in practice wherein many countries still govern on a sector-by-sector basis (Taljaard et al., 2012; Celliers et al., 2013). Engaging stakeholders in meaningful participation is also challenging (Christie et al, 2005). The continuation rate of ICM projects in developing countries, in particular, is often low when external financial support ends (Pollnac & Pomeroy, 2005). Nevertheless, through years of re-evaluation and development, ICM remains one of the most effective approaches for governing the many activities coastal areas support and addressing known wicked problems of sustaining livelihoods, mitigating human impact on ecosystems, and safeguarding coastal areas against natural hazards.

ICM attempts to address the socio-ecological complexity of coastal areas, and thus is multipurpose-oriented and composed of many elements. In this study, ICM's attention to relationships among coastal stakeholders is of particular focus. While conflict resolution is a recurrent theme in ICM, Cicin-Sain and Knecht (1998) highlight the

importance, and challenge, of recognizing mutually supportive interactions among activities. Ultimately, governance involves both problem solving and opportunity creation (Jentoft, 2007) and thus, this study posits that both negative and positive relationships among stakeholders should be examined, with the latter holding potential for synergistic effects.

2.2 Synergy

This section introduces the concept of synergy. To begin with, its background and usage within this study are outlined. Next, the motivation to study synergy within the context of coastal areas is presented, followed by a discussion of synergy potential among tourism, fisheries, and conservation activities.

2.2.1 Background and definition

Synergy, derived from the Greek term *synergos* for "working together" (Harper, 2010), is a term common in both colloquial usage and many different fields of study—particularly within the realms of social organization, human resource management, economics, and epidemiology. The concept of synergy also spans a diversity of disciplines under an assortment of different aliases, some of which include emergence, symbiosis, mutualism, coevolution, symmetry, epitasis, systematic effects, and interdependencies (Corning, 1998). Such examples are all underpinned by a similar understanding of synergy whereby the emergence of an effect is created through various forms of cooperative phenomena (Corning, 1998).

In the social sciences, anthropologist Ruth Benedict (1887-1948) has been accredited with one of the first developments of the term where she described societies as having 'high' and 'low' synergy—with high synergy being indicative of social structures that enable mutually beneficial actions (Maslow, 1964). Although various definitions exist today, in most cases synergy is employed in a similar reference with outcomes or capabilities that emerge from interrelationships among system components (Chadwick, 2010; Harris, 2004). In line with systems theory, synergy places importance on studying components together instead of in isolation of one another and likewise follows Aristotle's oft-quoted expression summarized by the phrase *a whole that is greater than the sum of its parts* (Corning, 1998).

The term synergy is commonly used implicitly to denote agreeable outcomes; however, it is important to note that synergy can also describe combined action leading to neutral or adverse results (Nevo & Wade, 2010). For instance, increased rates of sea level rise and ocean acidification combined have the synergistic effect of creating a heightened erosional state for shallow corals (Vernon et al., 2009). For the purposes of this study, the term synergy will only be used in reference to positive emergent properties.

2.2.2 Exploring synergy in the context of coastal governance

Within the field of coastal governance, attention to biological interdependencies and synergy in the form of symbiosis and mutualistic relationships has played a major role in the shift from species-based conservation to ecosystem-based (UNEP, 2011). Similarly, a sector-based approach for addressing the ecological impacts, such as

pollution, has proven to be uneconomical and largely ineffective as the combined effects of pollutants from different sector-based sources must be recognized (Taljaard et al., 2006). The social counterpart of coastal governance, on the other hand, has also emphasized the interactions and relationships between stakeholders to promote a systems-based approach. However, the positive emergent properties that may exist when stakeholders are considered together are often overshadowed by an emphasis on their incompatibilities. Even within the ICM framework, where the harmonization of relationships and promotion of cooperation and coordination is paramount, the emphasis on compatibility is largely in reference to the governmental and non-governmental agencies as well as economic sectors rather than at the stakeholder level (Cicin-Sain & Belfiore, 2005).

Concerns of competition and conflicts among stakeholders, which can breed adverse environmental impacts, are common within coastal literature. Hardin's (1968) "The Tragedy of the Commons," has largely influenced this perspective where humans, as rational beings, are portrayed as being primarily motivated by self-interest. In this narrative, the tendency for humans to maximize personal profit recurrently takes precedence over their consideration for fellow resource users. Ultimately, uncurbed competitive action is depicted to cause the eventual demise of sought-after resources. This seminal piece has created a lasting image in coastal management, spurring the trend to privatize common-pool resources (Jentoft et al., 2010). In critique of Hardin's argument, Ostrom (1990) refutes the proposition that commons are faced with inevitable exploitation, as actors cannot be characterized by zero-sum relationships alone. She posits

that relationships founded in trust and reciprocity can enable cooperative action among stakeholders (Ostrom & Walker, 2003). Of these different perspectives, scale and context can play an important role. Co-operative action, as supported by Ostrom, may be better suited for governance of natural resources at small-scale, local contexts (Araral, 2014).

With respect to local stakeholder heterogeneity, relationships can provide insight as to where positive connections exist. The possibility of synergy among stakeholders recognizes that relationships are neither void of meaning nor necessarily in conflict with one another, and thus may provide a source of unrealized opportunity (Bavinck et al., 2005). The combined action, across groups, can enrich the quality of decision-making and problem-solving processes as it builds on a more diverse set of knowledge, insights, and experiences (Hertel, 2011). Through recognizing and building social capital, mutual benefits can be achieved (Harris, 2004). For instance, the quality of interaction between humans and the natural environment, in many cases, hinges upon the quality of relationships within the social system itself. Barry and Smith (2008) posit that stewardship cannot be attained in social systems fraught with social injustices, oppression, and authoritarianism. Instead, appreciation, equality, and respect lay the groundwork for 'genuine relationships' with one another, which then enable 'genuine relationships' with nature (Barry & Smith, 2008).

The inherent positive relationships and interdependencies within a social system, however, are often undervalued. Institutional approaches have the tendency to focus on the needs, inadequacies, and deficiencies rather than the abilities, skills, and gifts people

have to offer (McKnight, 1997). Evans (1996) argues that the potential for synergy often exists at a social system's smallest scale, the community, and its most basic unit: the household. Relationships among neighbors, friends, and family are founded in trust and comprise important assets of social capital that are prevalent in most communities, yet are often not fostered to bring synergy to fruition by extant institutions (Evans, 1996). In addition to forming spatial demarcations to separate different uses/interests, the promotion and fostering of cooperative relations among stakeholders should also be an aim of coastal managers (Jentoft & Buanes, 2005). Instead, capacity often lies dormant and the potential for collective problem solving and creative solutions remains unrealized (McKnight, 1997; Moser, 1998).

Capacity building is a key component of ICM and contributes to the long-term sustainability of ICM processes (Taljaard et al, 2012). However, 'capacity' is often used in reference to state and market-based institutions with little consideration to the community level—an area identified as requiring greater attention (Christie, 2005). The community-level, in general, is often overlooked in the role it can play in coastal resource management (Jentoft, 2000). Even when the community is of focus, it is often regarding community-based institutions as opposed to individual actors. As McKnight (1987) notes, institutions and individuals require different approaches to capacity building. An element of capacity building is relationships (Feeley et al., 2008), and it is here at the individual stakeholder, rather than institution, level that this study speaks to. Specifically, synergistic relations between stakeholders may contribute to local capacity building within ICM. Understanding existing capacity through the assessment of relationships could help to

inform context-appropriate strategies that foster supportive relationships and enhance potential for environmental stewardship.

Positive linkages among tourism, fisheries, and conservation activities may present important sources of mutually supportive benefits (Lopes et al., 2015), and thus a potential source of capacity for governance and stewardship. Of the three activities, synergistic relationships among tourism and conservation activities have the most support in the literature. Tourism activities can have adverse socio-ecological impacts (Wongthong & Harvey, 2014). However, they are often depicted as being "non-extractive" or having "low-impact" and are typically considered more favourable to conservation in comparison to other activities such as oil exploration and fisheries (Young, 1999; Meletis & Campbell, 2007). Conservation efforts help to maintain the aesthetic beauty and healthy ecosystems, which draw tourists to coastal areas. In turn, tourism can provide economic benefits (Thiele et al., 2005), such as the revenue gained from park entrance fees (Burke et al, 2011). Fisheries, on the other hand, are often discussed in terms of the benefits they can gain from other coastal activities rather than their contributions (Pascual-Fernández et al., 2005). For instance, tourism and conservation activities are upheld as providing fishers with alternative livelihoods and ecosystem services, respectively. Exclusion of fisheries and other human activities from MPAs, in the form of no-take marine reserves, is still considered to be the most effective conservation measure. However, in the case of Koh Chang, different scales of fisheries take place—most of which are small-scale operations. McConney et al. (2014), for instance, illustrate the important role small-scale fishers can have for coastal stewardship.

Unlike large-scale industrial fisheries, managers, and politicians, small-scale fishers interact with coastal ecosystems on a daily basis and have a vested interest in its overall health in terms of livelihood dependency, food security, and cultural heritage (Gasalla, 2011; Soliman, 2014).

In many cases the mutual benefits experienced by tourism, fisheries, and conservation are based in theory or are anecdotal in nature and lack empirical support. To contribute to this discussion and to offer another avenue for inquiry, the potential for synergy among stakeholders is presented in this study. The interactive governance framework, elaborated below, offers a systematic approach that can guide the study of synergy based on stakeholder relationships.

2.3. Interactive governance: A conceptual framework to study potential for synergy

Interactive governance offers a holistic lens to study complex societal problems. For over a decade, the interactive governance perspective has been illustrated through, and applied to, studies of capture fisheries, aquaculture, and coastal/marine resource management and conservation (Bavinck et al., 2013; Chuenpagdee, 2011a). Its distinguishing characteristic is its emphasis on interactions (Kooiman et al., 2008). Interactions are recognized as ubiquitous forces within societies. Solutions to wicked problems are never held by a single actor, but instead are outcomes of a complex web of interactions (Kooiman & Bavinck, 2005). Interactive governance is defined as follows:

> "The whole of interactions taken to solve societal problems and to create societal opportunities, including the formulation and application of

> principles guiding those interactions and care for the institutions that enable them (Kooiman & Bavinck, 2005, p. 17)."

Interactive governance is a comprehensive framework and only the main components that pertain to this study are presented here. This section will provide an overview of the systems-based approach, the concept of governability, the system property of complexity, and the governing orders.

In order to study interactions, interactive governance employs the concept of societal systems as a heuristic tool, which includes the system-to-be-governed and governing system, which are connected by the system of governing interactions (Figure 2.1) (Kooiman, 2008). The system-to-be-governed is the object of the governing system and is comprised of both natural and social components. It is within the frame of the systems-to-be-governed that this study is situated.

Additionally, within the interactive governance framework, is the distinct, yet related, concept of 'governability.' As previously noted, governability refers to the capacity of the governing system in meeting the needs of the system-to-be-governed (Kooiman, 2008; Jentoft & Chuenpagdee, 2015). Governability is assessed through properties of diversity, complexity, dynamics, and scale, which are inherent to each system (Figure 2.1) (Jentoft & Chuenpagdee, 2009). Diversity looks at the heterogeneity of the system, such as what components and characteristics are present. Complexity focuses on the connectivity and relationships between the components, such as how they

condition each other. Dynamics address the interactions between system components and how they may be volatile or change over time. Scale specifies the boundaries of the system under analysis that contain the relationships and interactions (Table 4.1). The consideration of system properties is based on the hypothesis that the greater the diversity, complexity, dynamics, and scale, the lower the governability of the system (Chuenpagdee & Jentoft, 2013).

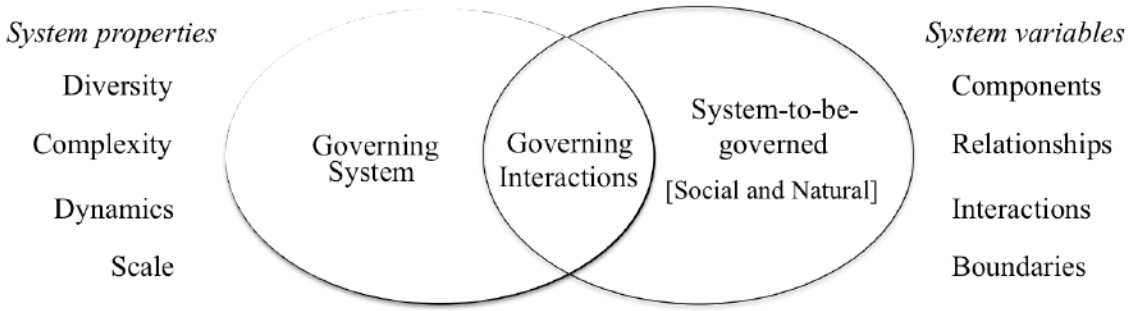

Figure 2.1: Governability assessment (*Source*: Jentoft & Chuenpagdee, 2009, p.556)

With consideration of all the system properties, this study focuses on understanding complexity through an assessment of relationships. Specifically, relationships between stakeholders from tourism, fisheries, and conservation activities are examined. While antagonism between these stakeholder groups may be inevitable, interactive governance highlights another side to this scenario, positing that interrelationships among seemingly disparate groups do not always fall under the assumption of inherent incompatibility (Jentoft & Buanes, 2005; Bavinck et al., 2005). Instead, it provides an alternative perspective wherein relationships may provide sources of system strength and that together they may offer potential for synergy for achieving a

common goal (Bavinck et al., 2005). Attention to the formal and informal governing actors, and the interactions between them, in addressing complexity among coastal stakeholders is another consideration of this study.

Interactive governance introduces the concept of governing orders, which are described in terms of first, second, and third or 'meta-'orders (Kooiman et al., 2008). The orders are intrinsically linked together with the first order being embedded within the second, which are both situated within the meta-order of governance. The first order describes the daily activities of solving problems —characteristic of the role managers perform. These activities take place within the second order of institutional arrangements. Institutions are rules, formal or informal, yet persistent in nature, which govern human behaviour and decision-making (Kooiman & Bavinck, 2013). They also involve the organizations vested with decision-making authority regarding the implementation of the rules (Kooiman & Bavinck, 2013). The final order, the meta-order, is the most abstract and thus, is often the least subject to assessment and analysis of its role in governance (Song et al., 2013). The meta-order pertains to the values, images, and principles which act to "feed, bind, and evaluate" the governance process overall (Kooiman & Bavinck, 2005, p. 20). Together, the orders of governance provide a systematic approach to study the potential for synergy and are further elaborated below for the context of this study.

2.3.1 Governing orders and synergy

Kooiman (2008) acknowledges the difficulty of investigating the complexity of a social system as simplification to gain insight inevitably jeopardizes the level of

complexity itself. In an effort to study relationships among stakeholders, the concept of governing orders plays a valuable role in assessing overall complexity. With the first order being the most tangible: the on-the-ground, daily interactions among stakeholders. The first and second research questions of how stakeholders relate to one another in their judgments of coastal activities and the quality of relationships reflect the first order governance. As to the second order, the study considers stakeholder groups in a dual role of both the object and subject of governance (Bavinck et al., 2013). The latter, looks at the activities institutionalized by tourism, fisheries, and conservation groups as a governing system. Thus, the third research question assesses the level of influence groups have in shaping governing institutions through the role they play in coastal governance, which is the essence of the second order. And lastly, the meta-order of governance is addressed through the fourth research question, which pertains to the values and awareness stakeholders have in respect to stewardship behaviour.

At each order, agreement among stakeholders is assessed to provide indication for potential synergy. The overarching hypothesis here is that if synergy potential is portrayed within the first and second order, over the long-term it can aid in bringing meta-order principles into fruition. One can, of course, argue that the knowledge about meta-order governance can also help set appropriate institutions (second order) and guide proper actions (first order). In the context of this study, understanding values and principles like moral responsibility helps align the second and first order with the ethic of environmental stewardship, as discussed below.

2.4 Environmental stewardship

Human activities have had a profound impact on the planet as evidenced by a myriad of human-induced wicked environmental problems, including climate change, ocean acidification, as well as widespread habitat loss and species extinctions (MEA, 2005). There is little doubt that the influence the human race exhibits on the Earth is unparalleled by any other species (Roach, 2000; Palmer, 2006). Although human agency on global ecosystems is dominant, humans—as a part of the natural world—also experience the repercussions of the degradation of ecosystem services (Chapin et al., 2010). Given the complex relationships and interdependencies of humans and nature, longstanding arguments have been made for ethical re-examination of this relationship (Leopold, 1966) and greater human engagement to address environmental problems (Westphal et al., 2014). Here, the concept of environmental stewardship is presented, which invokes the responsibility of care in human interactions with nature. To start, an overview of stewardship's biblical and associated critiques are presented, followed by its secular usage and definition.

2.4.1 Biblical origins

The English term "stewardship" comes from the Anglo Saxon word *stigu*—meaning sty or cattle pen—and *weard*—warden or guardian and has developed into common understanding of being charged with the care of something (Roach, 2000). Reference to stewardship can be traced to Christian traditions through scripture in the Book of Genesis in the Old Testament. There, interpretations of stewardship stem from the relationship between God, man, and nature. Man is vested with the duty to take care

of nature—referenced in the context of the Garden of Eden or Creation—on behalf of its creator. Thus, there is a three-tiered relationship of God as the 'appointer' or 'owner', man as the 'steward', and nature as the 'ward' or 'property' (Roach, 2000). In other words, the steward is entrusted with care of property on behalf of the owner to whom he is ultimately accountable (Wunderlich, 2004). Similar teachings are also found in Jewish and Islamic texts (Attfield, 2014). Biblical origins, however, have been a source of controversy for stewardship's modern-day usage as an environmental ethic. Some of the main points of criticism include the model's hierarchical structure coupled with the biblical reference of 'dominion' over nature, as well as its seemingly anthropocentric-orientation and managerial approach.

'Dominion,' used today to imply control or domination, is referenced in the bible with God saying to man "have dominion over the fish of the sea and over the birds of the heavens and over every living thing that moves on earth" (Gen. 1:28 English Standard Version). Interpretations include attributing man, made in God's image, as the rightful user and exploiter of nature in that nature's sole purpose of existence is for the benefit of mankind. Christian influence based on this hierarchical depiction has been ascribed to validate widespread environmental degradation. This notion was made popular by Lynn White's famous—though largely contested—article in *Science* (1967) entitled, "The historical roots of our ecological crisis." White argues that biblical teachings of hierarchy have fueled western dominance of nature through capitalism, technology, and science (Roach, 2000; Attfield, 1991). However, this interpretation of dominion has been refuted as being fundamentally paradoxical as humans' dependency on nature precludes its

inclination towards despotism (Black, 1970). Similarly, humans do not become the 'owners' of land to then use and exploit it as they please. Instead, they are entrusted with guardianship of nature with accountability to God (Black, 1970) and as Callicott (1984, p.302) describes, can be interpreted as a "special responsibility" of humans rather than a "special privilege." Further, other interpretations of the Old Testament include dominion depicted as human respect for fellow creations of God, wherein relations are also characterized as horizontal as opposed to solely top-down (Berry, 2006) and supports interpretations of dominion as being aligned, even synonymous, with a concept of stewardship based on care (Attfield, 1991; Siemer & Hitzhusen, 2007).

The concept of hierarchy in stewardship—man over nature—also fuels criticisms of anthropocentricism and managerialism. Humans' distinctness from the rest of nature, for instance, is used to support their capacity of acting as stewards (Peterson, 2001). Clare Palmer (2006) criticizes the integrity of stewardship as an environmental ethic based on its underlying assumptions that human interests form the basis for care, wherein nature, in its subordinate role, *needs* humans to take care of it, and that humans are equipped with the knowledge and ability to enable nature to flourish. However, Robin Attfield (2006) maintains this notion to be unfounded in biblical reference. Instead, he finds support for nature having importance irrespective of human valuation and thus, deserving protection and care in its own right (Attfield, 2006). The concept of being ultimately answerable to God, rather than human ownership, rejects the exploitation of nature and invokes the quality of humility towards nature and one's fellow man (Attfield, 2006). 'Answerability'

or accountability also plays a key role in the secular use of stewardship and unites the two in a common understanding.

2.4.2 Secular usage

Stewardship has been adopted in secular usage to imply a similar meaning to its religious counterpart: to responsibly care for the Earth. However, it has also been a term used in common expression without reference to its broader meaning. As such, it often lacks depth and, in contemporary reference, has been simply used to describe dutiful recycling (Berry, 2006). Nonetheless, reference to its broader meaning has important practicality and resonates with a diverse set of values and cultures (Roach, 2000), and thus should not be dismissed simply as an academic buzzword. In secular understanding, there is still a three-tier model with humanity as the stewards and non-human nature as the ward. It is the top tier, upheld by God in the previous section, which carries a certain ambiguity in this context: *to whom/what are stewards answerable?*

A key tenet of stewardship is that humans' relationship with the land is not founded solely on self-interest though it does not prevent humans' right to use nature (Leopold, 1966). Instead, other values drive the principle of responsibility. Thus, the top tier in secular reference is not occupied by one concept, but rather a variety of potential values with the most common being of future generations. For instance, the Earth never belongs to one generation, and thus by virtue condemns the exploitation of resources and degradation of ecosystems (Attfield, 2006). Consideration of generations can be extended, not only to the future, but also to past and current. This invokes altruistic values

of love for today's neighbor as well as respect and responsibility for pro-environmental legacies of past generations. Robin Attfield (2006) refers to this cross-generational consideration as the "transgenerational community" to whom stewards are responsible, which in turn more aptly addresses the concept of answerability. Intrinsic value of nature can also be found in the top-tier. Stewardship includes both responsibilities regarding 'use' of nature as well as the protection of nature. However, it does not necessitate human intervention for nature to thrive, but can support leaving areas alone as well (Attfield, 2014).

When considered together, religious and secular interpretations of stewardship do not need to be pitted against one another and can instead be considered complementary to achieving the same outcomes (Berry, 2006; Attfield, 2014). Thus, stewardship is not only a foothold for Christian traditions, but rather a platform for a widespread set of values, both of which are fueled by love, compassion, and loyalty (Attfield, 2006) and which, in turn, provide a valuable model for studying humans' relationship with nature.

The concept of stewardship is often discussed in terms of terrestrial nature such as land tenure, gardening, forestry, and urban planning with few extensions towards coastal and marine environments. It is within the coastal context that this study explores stewardship as a possible outcome of synergistic relations among local stakeholders. It is recognized that coastal communities are an integrated component of coastal systems as their interactions can impact both the degradation and conservation of ecosystems

(Pinkerton, 2009; Chuenpagdee, 2011a). Thus, the community can play an important role in enabling stewardship as it is at this level that local values, attitudes, and images can contribute to creating appropriate management strategies and meaningful public-government relations (Carr, 2002). The voluntary nature of stewardship activity enables it to build upon local knowledge and values and be motivated by common concerns which are often masked by formal management approaches (Roach et al., 2006); in doing so, it recognizes capacity-building potential within the community. Additionally, the attachment or "sense of place" can influence stewardship activities (Cantrill, 1998). Stewardship invokes a collective consideration to a place. Even in situations when individual action is taken, there is an awareness of how their actions affect others in the community (Barry & Smith, 2008). As such, care for local ecosystems, interacting social relations, and maintaining meaningful place embody stewardship efforts at the community level (Barry & Smith, 2008).

Further, those who interact directly with the environment have the greatest potential to act as stewards. This claim is supported through stewardship's biblical reference of a steward being the one "who tills the soil" and, in the case of coastal areas, suggests hands-on daily care would best describe the role of small-scale fishers (Roach, 2000).

In order to study the potential for synergy among coastal stakeholders, and its possible implications for environmental stewardship, a place-based example is important. The coastal area of Koh Chang provided an ideal study area. Details of Koh Chang are

further elaborated in the following chapter with an introduction to tourism, fisheries, and conservation activities on the island.

Chapter Three

Study Area: Koh Chang, Thailand

The aim of this chapter is to provide detailed description of the study area, Koh Chang and support its relevance for illustrating synergy and stewardship in practice. First, the island's physical geography is introduced with descriptions of geographical location, topography, climatic conditions, ecology, and biodiversity. Second, a brief history of development on Koh Chang is presented. Third, human geography is outlined with particular emphasis of the tourism, fisheries, and conservation activities on the island as well as key governing actors in the coastal area.

3.1 Physical geography

Koh Chang Archipelago is located in the upper eastern section of the Gulf of Thailand in Trat Province (Figure 3.1), approximately 350km from the nation's capital, Bangkok. Trat is Thailand's easternmost coastal province situated between Chanthaburi Province to the west and, with the natural border demarcation of the Banthat mountain range, Cambodia to the east. Distanced 10km from mainland Trat's Laem Ngop District, the island chain is comprised of approximately 52 islands. *Koh* is Thai for 'island' and the three largest islands in the chain include Koh Chang[1] (209km^2), Koh Kut (105km^2), and Koh Maak (16km^2), which are respectively aligned from north to south. Koh Chang

[1]Note: 'Koh Chang' is used in reference to the island alone. Any references to the greater island chain are specified as 'Koh Chang Archipelago.'

(12°02’ N, 102°19’ E), specifically, was selected as the study area as it hosts the vast majority of the residents within the archipelago.

Figure 3.1: Map of Koh Chang, an island situated within the Gulf of Thailand

Koh Chang is mainly mountainous and is the location of the two highest peaks in the archipelago, Alak Petch Peak (743m) and Khao Yai Peak (473m) (Tanoamchard & Limjirakan, 2012a; Rochanarat, 2007). Many streams collect rainwater from the mountain slopes and support a number of waterfalls on Koh Chang, including two renowned ones: Klong Plu and Than Mayom. Flat land, used predominately for fruit and rubber plantations, exists along the northern, central and—to a small extent—southern areas of the island (Rochanarat, 2007). In general, development has been concentrated along the periphery of the island leaving the centre of the island to remain lush, tropical rainforest.

The island is located in a tropical area and seasonal variations are largely influenced by the southwest and northeast monsoon periods. The southwest monsoon denotes the wet season between May and October, which brings high waves, strong winds, heavy rains, and occasional storms (DNP, 2014), particularly to the west and southwest sides of Koh Chang (Lunn & Dearden, 2006b). During this time, the temperature range is around 19-36°C (Tanoamchard & Limjirakan, 2012a). The annual rainfall in Koh Chang is amongst the highest in Thailand with an average precipitation between 5,500-6,500 mm/yr. (Tanoamchard & Limjirakan, 2012a), approximately 90% of which occurs within the wet period (UNEP, 2007). The northeast monsoon represents the dry season from November to February (DNP, 2014), and is characterized by calm seas (UNEP, 2003) with a temperature range between 18-30°C (Tanoamchard & Limjirakan, 2012a). March and April make up the summer season with high humidity and high

temperatures, particularly in April with temperatures ranging between 21-38°C (Tanoamchard & Limjirakan, 2012a).

The shorelines surrounding the island are made up of both rocky and sandy beaches. Larger stretches of sandy shorelines are located on the west coast. Sheltered bays support dense mangrove forests with the largest mangrove areas being located predominantly on the east coast. In total, there are about 13 mangrove species on the island (UNEP, 2003). Within the greater Koh Chang Archipelago, there is an estimated 16km^2 of coral reef (UNEP, 2003). Fringing coral reefs surround the islands in water depths between 5 and 15m (Rochanarat, 2007). Coral communities can also be found on offshore pinnacles (UNEP, 2003).

The coastal areas of Koh Chang are biologically diverse. According to a survey conducted by researchers from Kasetsart University in 2002, for instance, twenty species of crab, four species of prawn, and 224 species of shellfish were recorded (Rochanarat, 2007). Also discovered were twenty-six species of sponges, 139 species of phytoplankton, as well as a variety of red, green, and brown seaweeds (Rochanarat, 2007). Similarly, the reefs are comprised of a variety of coral species with an estimated total of 130 scleractinian coral species in the Koh Chang archipelago (UNEP, 2003). Dominant coral species include *Porites lutea*, *Pavona descussata*, *Echinopora lamellosa*, *Goniopora* spp., *Pavona* spp., *Symphyllia* spp., *Fungia* spp., and *Astreopora* spp. (UNEP, 2003). For reef fishes, over 113 species have been recorded, including economically valuable species such as those belonging to *Lutjanidae*, *Serranidae*, and *Haemulidae*

families as well as coral reef indicator species of families *Apogonidae*, *Labridae*, and *Pomacentridae* (UNEP, 2003). There are also vulnerable species, such as the dugong (*Dugong dugon*) (IUCN, 2008) and whale shark (*Rhincodon typus*) (IUCN, 2005a), as well as the endangered green sea turtle (*Chelonia mydas*) (IUCN, 2005b) and critically endangered hawksbill sea turtle (*Eretmochelys imbricata*) (IUCN, 2008). Overall, the marine biodiversity in the Koh Chang archipelago is considered to be comparatively high for the western region of the South China Sea, which includes the Gulf of Thailand (UNEP, 2003).

3.2 History of settlement and development

Koh Chang and the surrounding islands were relatively pristine until around the beginning of the nineteenth century. His Majesty King Rama V, who reigned from 1868-1910, visited Koh Chang numerous times. Of his sixteen trips within Thailand, twelve were believed to have been to Trat Province—several of which were to Koh Chang. King Rama V was said to be fond of the tropical rainforest, its biodiversity, and particularly the waterfalls (Rochanarat, 2007). Today, his initials can still be seen etched in the rock face at the Than Mayom waterfall. The historical significance of royal visits has contributed to the government's motivation and support for Koh Chang to be developed as a national park and later tourist destination (Personal Communication, DASTA Employee, 2014).

In the early 1900s, the island became populated by a small number of residents with the establishment of the first fishing village, Salak Phet, in the 1920s (Rochanarat, 2007). Years later, in 1967, a scientific survey was conducted to assess Koh Chang's

diverse terrestrial and coastal ecosystems. Koh Chang was found to meet the national park criteria, with its suitability for conservation, based on ecological integrity, the presence of naturally, historically, and culturally significant areas as well as opportunities for tourism, recreation, and education activities (RFD, 2002). In 1982, the Department of Forestry established Mu Koh Chang National Park (MKCNP) (DNP, 2014). The park boundary encompasses 47 islands, including Koh Chang (Figure 3.2), with a total park area of 650km^2, 70% of which is marine (DNP, 2014). Inhabitants settled in several villages prior to the park declaration were permitted to stay as enclave communities in about 15% of the park's area (Jentoft et al., 2011). The park was established with the goal to preserve the natural environment as well as to enable research and recreational activities for the benefit of current and future generations (DNP, 2014; Jentoft et al., 2011).

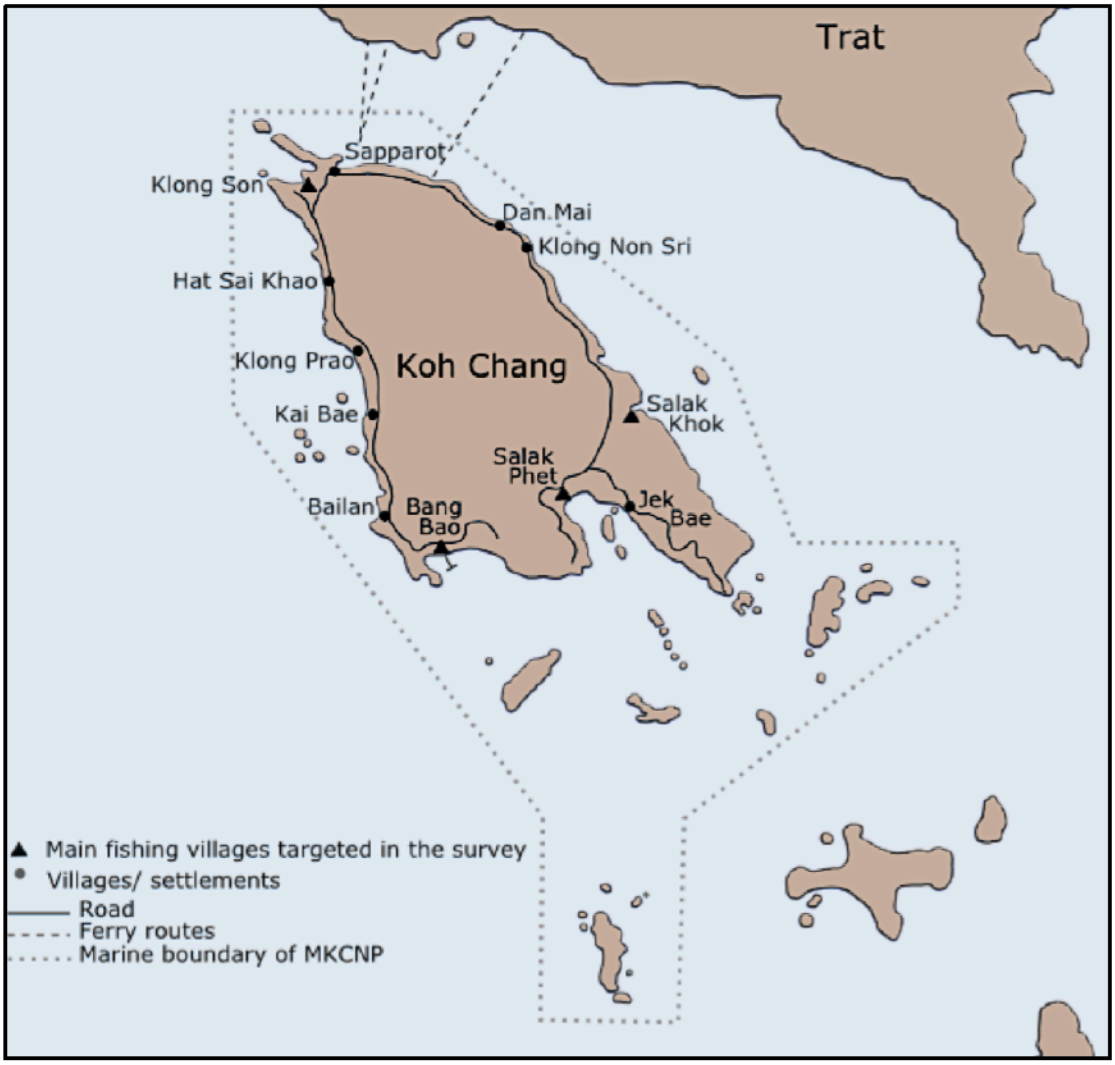

Figure 3.2: Map of villages and park boundary on Koh Chang

Tourism, and subsequent development, in Koh Chang began relatively late in comparison to other island and coastal destinations in Thailand. It was not until the early 2000s that tourism development had a rapid upsurge following government policies and effective marketing schemes (Roman et al., 2007; UNEP, 2008). In 2004, the Thai government, led by former Prime Minister Thaksin Shinawatra, deemed both MKCNP and Trat coastline as a special territory under the control and supervision of the

Designated Areas for Sustainable Tourism Administration (DASTA) (Rochanarat, 2007). DASTA was developed as a pilot study to heighten the region's profile as a tourist destination in an effort to increase its competitiveness and to promote local investment (Rochanarat, 2007).

The plan for tourism development on Koh Chang was to provide a niche market comprised mainly of resort-style tourism and ecotourism (Roman et al., 2007). The tourism industry, in general, has greatly favoured the western coast of the island. There, the white, sandy beaches attracted hotel and resort developers. Land prices, in turn, increased and prompted many island residents to sell their land, despite not possessing official land titles (Jentoft et al., 2011). Koh Chang's western coastline underwent a rapid transformation from a relatively unknown and pristine destination to one populated with hotels, bungalows, souvenir shops, convenience stores, banks, cafes, restaurants, bars, and travel agencies (Roman et al., 2007; Rochanarat, 2007). Additionally, following the 2004 Indian Ocean Tsunami, which impacted the Andaman coast in Thailand, tourism within the Gulf of Thailand, and specifically in Koh Chang expanded (Roman et al., 2007). In 2007, approximately one million tourists visited the island—700,000 and 300,000 Thai and foreign tourists respectively (Jentoft et al., 2011). This was a significant increase compared to the 2003 figure of 247,000 tourists, of which 85 % were Thais and 15% were foreigners (Jentoft et al., 2011). In comparison to rapid tourism development on the west coast, the east coast of Koh Chang is still primarily comprised of fishing and farming-based communities. There, Salak Khok and Salak Phet form the largest villages, both of which maintain traditional coastal homes built upon wooden stilts interconnected by

boardwalks but also accommodate more modern land-based houses. Tourism is important but on a different and smaller scale, with guesthouses and homestays within the villages themselves.

3.3 Human geography

As of 2013, the resident population of Koh Chang was 7,748 from 5,054 households (DPA, 2013). The total number of people on the island at a time, however, can fluctuate significantly with upwards of 20,000 to 25,000 reported inhabitants connected to the tourism sector during the height of the tourist season (Jentoft et al., 2011). Further, latent migrant populations are also unaccounted for in official census (Tanoamchard & Limjirakan, 2012a). The main livelihoods on the island include tourism, retail, fishing, and farming (Lunn & Dearden, 2006b). The main agricultural crops grown on the island include rubber plantations as well as orchards that grow a variety of tropical fruit, including durian, mangosteen, pamelo, rambutan, banana, and coconut.

The island is accessible by ferry, which caters to walk-on passengers, private cars and other vehicles. Three ferry docks on the northern end of Koh Chang service routes to mainland Trat. One paved road nearly circumvents the island, yet remains unconnected with a gap of approximately 10km in the island's southern end. Starting at Klong Son village in the north, the road runs approximately 30km along the east and west coasts. Currently, there is no public transport on the island or car taxis. Covered pick-up trucks with seating in the back, known as *songtaews*, are the main mode of non-private transportation for visitors upon arrival. However, motorcycle and scooter rental stores on

the west coast are numerous and are often utilized by tourists to travel around the island during their stay. Travel on the island can be dangerous as the main road has many steep hills, sharp turns, and a narrow shoulder. Heavy rainfall has also made the road prone to washouts and landslides.

3.3.1 Coastal activities: Tourism, fisheries, and conservation

Koh Chang hosts a range of terrestrial and coastal tourism activities. Popular coastal activities include kayaking, swimming, snorkeling, SCUBA diving, sport fishing, mangrove boardwalks, and a variety of accommodation types are also offered some of which include homestays, bungalows and guesthouses, hostel, hotels, and resorts. Further, the recent development of a new wreck dive in Koh Chang has created another diving destination on the island. In 2012, a ship ceremoniously renamed the HTMS *Chang* was intentionally sunk off the island's southeastern shore. The HTMS *Chang* rests at a depth of 33m and is about 100m long—making it the largest wreck dive in Thailand.

Fishing activities consist of a range of different scales, with the majority being small-scale[2]. Small-scale fishing represents the main source of year-round employment for approximately 25-30% of the total number of households within the national park and is an important source of both subsistence and market-based income (Lunn & Dearden, 2006a). Multi-gear types used in small-scale fisheries include shrimp trammel net, squid

[2] According to Pimoljinda (2002) small-scale fisheries in Thailand are characterized as using non-motorized as well as outboard and inboard motored vessels under 10 GT. Gear types include, gillnets, traps, set bag nets, push nets, lift nets, and hooks and lines. Fishing typically involves family members and takes place within 3-5km from shore.

trap, crab trap, fish gill net, hook-and-line, reef trap fisheries, coastal gill net, krill scoop net, shell-fish gleaning, and small trawl net (Lunn & Dearden, 2006b). Target species of high-demand fish, such as groupers, shrimp, and crab, make up most of the fishers' market-based earnings while non-target species are typically kept as an important source of household protein or sold at a relatively cheap rate as bait, fertilizer, or aquaculture feed (Lunn & Dearden, 2006a). Many small-scale fishers participate in up to four fisheries throughout the year (Lunn & Dearden, 2006b). Medium-scale fisheries, in contrast, are fewer in number and have less diverse gear types. Night fishing using cast nets and light lures is a common medium-scale fishery on Koh Chang.

International, national, and local level organizations have been involved in conservation initiatives on Koh Chang. The international organization of the United Nations Environmental Programme (UNEP) and Global Environmental Fund (GEF), for instance, selected Koh Chang to be a part of the *Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand Coral Reef Demonstration Site Project* between 2003 and 2007 (UNEP, 2003). The overarching goal of the project was to reduce the causes of coral reef degradation by means of facilitating a new model of co-management in Koh Chang (UNEP, 2008). Another national conservation institution in Koh Chang is MKCNP, which, as described below, is also a prominent governing actor. The Department of Fisheries (DoF) has supported conservation through blue swimming crab (*Portunus pelagicus*) bank programs in the villages of Salak Khok and Klong Son. Crab banks are a voluntary project for fishers. They involve separating gravid females from their catch into holding tanks where they are held until they spawn at which point

the eggs can be released to improve crab recruitment (Thiammueang et al., 2012). Together, MKCNP and the DoF implement fisheries closures during certain periods. Additionally, DASTA is another organization responsible for addressing conservation needs and sustainable tourism development (Jentoft et al., 2011). DASTA, further elaborated below in terms of its governing role, has established and facilitated conservation projects related to sewage treatment, mangrove reforestation, artificial reefs, and promoting low-impact, sustainable tourism activities, such as cycling and kayak tours (Rochanarat, 2007; Personal Communication, DASTA employee, 2014).

3.3.2 Governing actors

The governing system of Koh Chang consists of a variety of governmental national departments and local administration levels. Key governing actors in the coastal area are described in greater detail here and include the local administration at the village and sub-district level, MKCNP, and DASTA.

The island represents one of the Trat province's districts, or *amphoe,* called Koh Chang District. In 1997, Thailand decentralized many governing responsibilities to the local level through the establishment of the sub-district administration office (Chuenpagdee & Juntarashote, 2011). Koh Chang District has two sub-districts, or *tambons*, called Koh Chang and Koh Chang Tai, which are respectively governed by local governmental organizations of Municipality of Koh Chang (population of 4,826) and Sub-District Tambon Administrative Organization—referred to locally as 'Au-Bor-Tor'—of Koh Chang Tai (population of 2,922) (DPA, 2013). Sub-district leaders are

elected by the community and they are responsible for the day-to-day, on the ground management of the sub-district including duties pertaining to resource management (Chuenpagdee & Juntarashote, 2011; Tanoamchard & Limjirakan, 2012b).

The village (*ban*) represents the lowest administrative unit and each village has an elected village head. There are a total of nine villages on Koh Chang. Officially, Koh Chang sub-district is made up of Klong Non Sri, Dan Mai, Klong Son, and Klong Prao villages and Koh Chang Tai sub-district includes Bang Bao, Jek Bae, Salak Khok, Salak Phet, and Salak Phet Nheu villages (Ninphanomchai et al., 2014). Other developed tourism areas on the west coast include Sapparot, Hat Sai Khao, Kai Bae, and Bailan (Figure 3.2).

Apart from local government administration, DASTA is a public organization that was established in 2004 with the intention of staying for a ten-year term. After being piloted on Koh Chang, six other DASTA locations have been established in Thailand. DASTA coordinates between different state-owned organizations for the vision of raising the standards of sustainable tourism in the area, such as the Office of Tourism Development and the Tourism Authority of Thailand (Rochanarat, 2007). DASTA also seeks to support local administration and livelihoods as well as encourage local community participation in conservation projects and tourism development (TIES, 2014).

The terrestrial and marine components of MKCNP are both managed by the Marine National Park Division of the Department of Wildlife and Plant Conservation,

which is a division under the Royal Thai Government's Ministry of Natural Resources and Environment (Lunn & Dearden, 2006b). Governing rules and regulations for MKCNP are described under the National Park Act (1961). According to the act, fishing activities within national marine park territory are prohibited (Lunn & Dearden, 2006a). Beyond the park boundary, a distance of over 3km offshore, fisheries monitoring and management of the marine areas is the responsibility of the Ministry of Agriculture's DoF (Lunn & Dearden, 2006b).

Chapter Four

Methods

This chapter first describes the stages leading up to the survey. Field observations and preliminary interviews were used to aid in the development of the questionnaire as well as to provide greater context of the social system, such as the system properties and the role of key governing actors. The main research instrument is then described in detail in terms of questionnaire design, translation, sampling method, and administration. To conclude, steps of data entry and analysis are further elaborated.

4.1 Preparatory stages

The primary method of this study was a survey using a questionnaire. The questionnaire was designed to address the research questions and, thus comprises the basis of the data analysis. Several preliminary field visits were organized to aid in the development of the questionnaire. Field observations and preliminary interviews, more specifically, helped to understand existing relationships and to further situate them within the broader social system by describing properties of diversity, complexity, dynamics, and scale in addition to providing details of the key governing actors within the coastal area. This section begins with an overview of the field visits, field observations and preliminary interviews followed by the outline of system properties.

4.1.1 Preliminary field visits

Three preliminary field visits were conducted within June and July 2014 that ranged from 3 to 5 days. These trips were arranged prior to an extended stay of 5.5 weeks during August and September 2014 at the end of which the questionnaire was administered.

During the first visit in June 2014, observations were aimed at gaining a better understanding of the island's geography, the spatial distribution of the villages, as well as identifying and locating sites where different coastal activities took place. In order to do this, a short scoping survey was conducted, which involved traveling around the island by foot and scooter, taking photos, and recording field notes. Together, the photos and notes were used to build a preliminary profile of each community. This visit was mostly observational, although informal conversations were held with different business owners in English to gain more information regarding the nature of various coastal activities. Fieldwork, in general, was conducted during the rainy season, and this trip in particular had unfavorable weather conditions to see many coastal activities in action. In addition to being the rainy season, and thus low season for tourism, the presence of tourists was rather scarce. Local business owners attributed this not only to the recent political changes with a military coup d'état only a few weeks prior (May 22, 2014), but also to the demonstrations leading up to the coup which deterred potential tourists from booking trips to Thailand during this time.

The second field visit in mid-July 2014 was primarily designed to conduct key informant interviews with the assistance of a translator. An interdisciplinary PhD candidate from Chulalongkorn University in Bangkok acted as the translator and the field facilitator for the administration of the questionnaire. The PhD candidate is a native Thai, but is rather fluent in written and spoken English, with his experience working with international scientists and with his frequent visits overseas, including to present papers at international scientific conferences.

The main purpose of the third visit was to pretest the questionnaire, which took place over the course of two days in late July 2014. Prior to pre-testing, the questionnaire in the field, however, an informal pre-test took place in a lab setting and was conducted with members of the Department of Biology's Marine Biodiversity Research Group at Ramkhamhaeng University. The purpose of this step is to understand question ambiguity and possible responses to questions (Williams, 2003; Singleton & Straits, 2001)—and in the case of this study, appropriate translation. Each participant had experience conducting research in Koh Chang and was able to make recommendations and comment on how the questionnaire may be received and what potential problems I may encounter in the field.

The formal pre-test on Koh Chang involved the assistance of the Professor from Mahidol University, the PhD Candidate and my supervisor. This provided the opportunity to trial run the questionnaire with potential questionnaire respondents. None of the respondents involved in the pre-test participated in the final questionnaire. The Professor from Mahidol University and the PhD Candidate administered the questionnaire, and

made notes on its interpretability and questions that caused confusion. Question acceptability was qualitatively assessed, based on the respondents' willingness to answer questions. Because the study involved participants from a range of education backgrounds, the adjustments to the questionnaire were made to accommodate everyone. Revisions to the questionnaire included re-ordering questions, reducing the number of activities, developing more suitable options for closed-ended questions, as well as introducing a numbered list of the activities during the questionnaire administration—referred to hereafter as the 'prop sheet' (Appendix A). The pre-test team, including my professor, met at the end of each day to discuss and finalize the questionnaire.

4.1.2 Field observations

Field observations were conducted throughout the course of time spent on Koh Chang. Field observations, in general, were both passive and participatory in nature. Observations from the preliminary field visits assisted in the development of the questionnaire, such as which coastal activities were likely to have a high degree of familiarity among respondents.

Over the course of the extended stay on the island, field observations involved spending time in different communities and observing surroundings, engaging in informal conversations, as well as recording field notes and taking photos—both of which were later organized by date and digitally annotated. In order to be respectful and to not infringe upon Memorial University's ethics agreement, photos were taken with the subject's permission. Many of the visits to different locations, such as boardwalks, or a

specific pier or beach, involved several hours of staying in one position and recording field notes on observations.

One day in particular involved sitting on the end of the pier in Bang Bao, a village on the southwest end of the island, for the day (12 hours). This pier serves as the main departure point for the majority of the tour boats (snorkeling, diving, sport fishing) and acted as an ideal vantage point for fishing vessels entering and/or exiting the bay. The main objective of this exercise was to document activities in a typical day (in the low season) in one of the busiest points of the island. There, I recorded tourist demographics, and the number and types of tour boats coming and going. I also observed nearshore fishing, as well as activities of processing, and selling of their catch to local restaurant owners.

4.1.3 Preliminary interviews

Preliminary interviews with key informants were conducted to gain a better understanding of the local context of Koh Chang, such as information on the local governing system, relationships between potential respondent groups, history of the island, as well as current social and environmental issues. These interviews served several purposes for this study. First, information gathered was critical in the development of the questionnaire so that questions were relevant and the activities to be included would have a higher level of familiarity with the potential respondents from both sides of the island. Second, they helped to build relationships with local leaders who could then act as contacts in the field. Third, they provided suggestions as to the best times to visit in order

to survey respondents, such as when fishers would be available given the typical fishing schedule of the target species during the anticipated timeframe of questionnaire administration. Finally, they enabled me to ask follow-up questions of the observations I had made up to this point. Key informants included village heads from the four villages in which the majority of the questionnaires were to be administered—based on the presence of all three activity groups; two representatives from DASTA; the Superintendent of Mu Koh Chang National Park; the head of the kayaking cooperative, *Koh Chang Spirit Club*; guesthouse owners; and the head of Koh Chang Tai District (Au-Bor-Tor).

4.1.4 System properties

In order to provide greater context to the social system-to-be-governed, described here in reference to tourism, fisheries, and conservation stakeholders, field observations and preliminary interviews were organized according to the interactive governance's governability assessment framework (Table 4.1). Relative to one another, each activity group, a scale of 'high,' 'medium,' and 'low' was used to describe each property. The key governing actors were also identified with particular attention to their relationships and interactions.

Table 4.1: Governability assessment framework: Social system-to-be-governed (Adapted from Chuenpagdee et al., 2008 and Chuenpagdee & Jentoft, 2013)

Governance Component	Governability Criteria	Measures and Examples
Social system-to-be-governed	-Prevalence of properties:	
	Diversity	**Components** *Demographics of stakeholders*
	Complexity	**Relationships** *Level of cooperation and/or conflicts between stakeholders*
	Dynamics	**Interactions** *Level of migration and mobility of stakeholders*
	Scale	**Boundaries** *The social, cultural, and ethnic boundary of stakeholders*

4.2 Questionnaire survey

Questionnaires are a well-established social science research method that offers a relatively simple method to elicit attitudes, values, beliefs, and motives (Robson, 2011). In the context of this study, use of a questionnaire was reinforced by the fact it was considered more appropriate for minimizing the data lost in translation and misinterpretation between the respondents and myself. The following subsections will provide details on the questionnaire design, translation, sampling method, and administration.

4.2.1 Design

The questionnaire was comprised of primarily closed-ended questions, with the main sections being designed around the study's research questions. Supplementary questions regarding basic demographics were incorporated to provide greater background

of the respondents included in the survey as well as of their participation in tourism, fisheries, and conservation activities. The research questions follow the interactive governance framework of first, second, and third—or meta—orders, which extend from most direct to most abstract. The questions in the questionnaire, however, were ordered from simple to more complex. Below, the sections pertaining to each governance order are described in greater detail. The instrument was reviewed and approved by Memorial University's Interdisciplinary Committee on Ethics in Human Research and is available in both English and Thai translations in Appendix A.

Directly following the introduction, a screening question was put forth to enable the respondent to self-identify which group—tourism, fisheries, or conservation—best describes their interaction with the coastal area. Section 1 then covered general demographics, which according to Babbie & Mouton (2001), is an advantageous place to start in the case of face-to-face survey administration as it aids the enumerator in building a rapport, in the short time they have, with the respondent because such questions are typically straightforward, non-threatening, and easy to answer. In addition to the screening question, the respondents were asked about their occupation and, if relevant, secondary occupation(s) to gain an understanding of their livelihood dependency on coastal resources. They were also asked specifically whether they participated in different forms of tourism, fisheries, or conservation activities (including 'other(s)').

Section 2 pertained to the meta-order of governance and involved questions of environmental motivations and asked for examples of stewardship behaviour. There,

respondents were asked to provide the level of importance of different environmental values on a four-point scale. This scale was also used for questions in Sections 3 and 4 and consisted of 'no/none,' 'low/somewhat,' 'moderate,' 'very/high' and 'don't know/no opinion' responses. In order to elicit a respondent's awareness of different stewardship behaviour occurring on the island, they were asked to provide examples of caring and responsible environmental behaviour demonstrated by tourism, fisheries, and conservation activities. This section concluded with a question about the level of familiarity with the different activities from tourism, fisheries, and conservation. This question provided a smooth transition to the following sections as this list of activities was used for the remaining questions. From the questionnaire pre-test, it was found to be useful to provide the respondent with the prop sheet at this point where the list of activities first appears. As the enumerator orally read the questions and recorded the responses, the prop sheet enabled the respondent to easily refer to the list of activities rather than the enumerator reading the entire list of activities aloud for each question and the respondent having to rely on memory recall.

The list of activities (Table 4.2), provided indicators to the operation of tourism, fisheries, and conservation groups in general. The selection of activities was based on the fact they occurred on both sides of the island, and therefore had a greater likelihood of respondents being familiar of them, and that they covered a range of scales that were common to tourism, fisheries, and conservation on Koh Chang. Preliminary interviews and field observations played a key role in identifying the activities as well as feedback from the questionnaire pre-test.

Table 4.2: Activity groups and corresponding activities included in the questionnaire

Activity Groups	Activities
Tourism	1. Bungalows & Guesthouses
	2. Kayaking
	3. Snorkeling
Fisheries	4. Shrimp Gillnet
	5. Squid Trap
	6. Push Net
Conservation	7. Coastal Rehabilitation (E.g. mangrove restoration, beach cleanup of DASTA and Au-Bor-Tor)
	8. Fisheries Enhancement (E.g. Artificial reefs, crab banks of DoF)
	9. Mu Koh Chang National Park

Section 3 was one of two sections created to address the first order of governance. It looked at both the positive and negative impacts of the activities on the island. Respondents were asked to provide the level of importance and the negative impact the activities had on the economy, community, and ecology of Koh Chang. This section was designed to compare how activities, individually and collectively, differ in their contribution and negative impacts on different domains of the island.

With reference to the institutional role activity groups have within the second order of governance, Section 4 asked the level of influence the activities have in the management of coastal resources. Respondents were then asked whether or not they considered their level of influence to be appropriate (yes/no). If found to be inappropriate,

respondents were then asked which level they would consider appropriate—ultimately looking for whether it was higher or lower than they considered it currently.

Lastly, Section 5 also pertained to the first order of governance by focusing on relationships. Here, respondents were asked to pair activities they considered being in positive, negative, or neutral relationships. They were also asked which activities they thought should engage in greater collaboration with each other in order enhance stewardship behaviour. For each relationship question, respondents could provide up to 10 pairs. This design was informed by the paired comparison method in which each activity is compared to one another and ultimately produces a scale of ranked activities (Dunn-Rankin, 1983). However, the nine activities in the questionnaire would form a total of 36 pairs, which was deemed too time-consuming and cumbersome for one question. Further, the purpose was not for each respondent to rank all of the activities, but rather to provide insight as to where connections existed. Thus, the aim was for respondents to indicate the pairs of activities they considered most obvious. A maximum of 10 pairs was decided upon during the questionnaire pre-test as a reasonable limit. The respondent used the prop sheet to point to the activity pairs or readily read the activity number for the enumerator to record.

4.2.2 Translation

Translation of the questionnaire was imperative to the instruments' efficacy in terms of first attempting to maintain the same words and second to preserving their meaning in a different cultural context—the lexical and conceptual equivalence,

respectively (Babbie & Mouton, 2001). Thus, translation of the questionnaire involved several stages.

While the questionnaire was still in an early version, the PhD candidate from Chulalongkorn University conducted the first translation. He was familiar with the research goals and the questionnaire's intention as well as the context of the study site and, later, acted as the field facilitator for the administration of the questionnaire. Prior to its pre-test, the questionnaire was sent to a professional translation centre in Bangkok, called Bangkok Translation. A Professor from Mahidol University in Bangkok—a native Thai speaker who is proficient in English— also helped correct the written questionnaire. She compared the two translations and translated them back to English. This method, known as "back translation," is a way to address lexical equivalence (Babbie & Mouton, 2001). In some cases, the English version had to be modified to find an appropriate Thai equivalent. This step was proven necessary as much of the meaning and nuances the questionnaire had in English were lost by translation through the translation service alone. Prior to the pre-test in the field, three researchers from Ramkhamhaeng University reviewed the questionnaire for clarity.

4.2.3 Sampling method

A non-parametric sampling method is commonly utilized when a random sample is not feasible (Robson, 2011; Payne & Payne, 2004), as in this case study. Purposive sampling, which targets specific respondents that are considered interesting or of a particular sub-set instead of being representative (Payne & Payne, 2004), was employed

to target respondents associated with tourism, fisheries, and conservation activities. Potential respondents were identified based on preliminary trips to the island.

Stemming from the assumption that there is greater potential for synergies among respondents if they are both familiar with the other coastal activities and have existing relationships, priority was given to those respondents most closely involved in interactions with the coastal environment and areas where tourism, fisheries and conservation activities take place. This included those who were directly involved with coastal-based tourism activities, fishing, or coastal-oriented conservation projects. The primary sites for data collection were locations where respondents from all three groups could be found. Assessment was made prior to questionnaire administration during scoping surveys in order to minimize travel time and maximize the number of respondents from each group. Fishing villages were the main sources of respondents as these were locations in which both fishing and tourism took place. Although there were other villages, they were either more tourism or fishing-oriented with few other coastal activities. The villages where most of the respondents were based were Salak Phet, Salak Khok, on the east coast and Klong Son, and Bang Bao on the west coast (Figure 3.2). These are not the sole fishing villages, but they represent the traditional fishing villages with the most fishers from each respective coast. In order to survey additional respondents, the villages of Dan Mai (East Coast), Hat Sai Khao and Bailan (West Coast) were also included. A brief description of targeted respondents from tourism, fisheries, and conservation groups is provided in Table 4.3 and survey locations in Table 4.4.

Table 4.3 Description of primary and secondary respondents targeted by the purposeful sampling method

Respondents	Description
Tourism	Primary respondents targeted from the tourism activity group included those involved in coastal tours, such as boat captains, boat guides, and crew for snorkeling, diving, and tourist fishing boats. Accommodation, such as homestays, guesthouses, and bungalows, in fishing villages as well as seaside restaurants were also targeted. Based on field observations and preliminary interviews, seafood restaurants that bought seafood products locally, from the docks in Koh Chang were targeted over others that import fish products from Trat mainland. A range of accommodation types is available on Koh Chang from budget backpacker basic huts and hostels to high-end resorts. Those directly located along the coast were targeted over others closer to the jungle. Exclusive resorts (private beaches) were not included as they were secluded in location and/or had restricted access and, thus, have little interaction with the other coastal operators. Secondary respondents included tourism stakeholders with a more peripheral connection to the coastline, such as tour agencies, resorts, and hotels.
Fisheries	Primary respondents for fisheries were people whose main occupation was a fisher, whether small-scale, medium-scale, or large-scale and regardless of gear type, vessel size, and species targeted. Secondary respondents included those who were involved in fisheries as a secondary occupation, and those involved in processing and selling fish products.
Conservation	Primary respondents for conservation were the leaders and organizers of conservation activities as they were assumed to be more familiar with coastal conservation projects on the island as well as their successes and challenges. Such respondents included leaders of locally based conservation groups, local village heads, employees with DASTA and MKCNP. Secondary conservation respondents were community members who self-identified as being most related to the conservation effort compared to tourism or fisheries in the questionnaire screening questions. These respondents likely included those who partake in conservation activities, such as volunteers, rather than those who lead them.

Table 4.4: Examples of target respondents and locations for purposive sampling of corresponding respondent groups

Respondent Groups	Respondents	Locations
Tourism	-Tour guides, tour boat captains, guesthouse owners, shop owners, tour agents, seafood restaurant owners	-Bang Bao pier, tour boats, travel agencies, tour offices, restaurants, supply/souvenir shops, guesthouses and bungalows, homestays
Fisheries	-Small-scale, medium-scale, and large-scale fishers, people involved in fish processing activities	-Docks, fishing boats, village houses
Conservation	-National park employees, local administration employees, village heads, community conservation leaders	-Mu Koh Chang National Park; local government offices; DASTA offices; village heads' houses

4.2.4 Administration

The survey was conducted over a 5-day period, from September 1-5, 2014. Three female, Thai enumerators administrated the survey with the assistance of the PhD Candidate—referred to hereafter as the field facilitator—and myself. The enumerators were trained by the field facilitator on the proper survey protocol prior to arriving in the field. Upon arrival, the enumerators were briefed again on appropriate survey administration. The enumerators administered the majority of the questionnaires while the field facilitator administered the questionnaire to the village heads, local government, and DASTA representative. The field facilitator and I observed interviews and noted whether respondents seemed engaged, and flagged questionnaires in the case of the respondent not being interested, which was evidenced in only one occurrence.

The questionnaire was administered on an individual, face-to-face basis and commenced with the enumerators approaching potential respondents and inviting them to participate in the survey. Face-to-face, in-person interviews often achieve higher response rates than those conducted by phone or through a self-administered format, as interviewer's presence can encourage participation (Robson, 2011). In accordance with Memorial University's ethical procedures, respondents were presented with an informed consent cover letter, which outlined their rights, promised confidentiality and anonymity of the information they provide, as well as the study's research purpose and objectives.

Upon agreeing to participate, the enumerators orally read the questions as written in the questionnaire to the respondent and recorded the respondent's answers in numeric codes. The enumerators were also available to clarify questions if necessary and were able to present the prop sheet for Section 2—both of which are additional advantages of conducting surveys in-person (Robson, 2011).

Four of the villages where the majority of the questionnaires were administered (Salak Phet, Salak Khok, Klong Son, and Bang Bao) were visited twice during the morning/early afternoon and late afternoon/evening. Overall, the questionnaire was conducted from approximately 9:00AM to 6:00PM. Besides visiting villages at different times, visits were also organized around tour schedules and known times when fishers were available from information provided through field observation and key informant interviews. Nonetheless, as the questionnaire was administered during normal business

hours, participation still depended on the availability of potential tourism, fisheries, and conservation respondents during the day.

A total of 140 questionnaires were completed with one being later removed due to noted disinterest and an obvious pattern in the responses. The overall response rate of the questionnaire was 96% with reasons for refusal including potential respondent being busy with work and not having time and, in two of the cases, potential respondents being from Cambodia and not familiar with Thai. Completion of the questionnaire ranged from 14 to 47 minutes to complete, with an average time of 25 minutes.

4.3 Data entry and analysis

Completed surveys were entered into an Excel spreadsheet during the week of data collection. The field facilitator translated all open-ended responses at the end of each day, which were then directly entered in text form and were later organized by categories and coded. Each record was quality checked for pattern responses and, when possible, proper understanding of questions.[3]

Before data analysis could take place, the responses to the rating questions were normalized to a common scale to enable comparison among rated objects, which in this case are the coastal activities. This was performed using a similar technique to the Dunn-Rankin's variance stable rank sums method (Dunn-Rankin, 1983). For closed-ended

[3] For questions pertaining to relationships, five records were removed due to clear respondent misunderstanding, which in effect reduced the sample size to 134 for questions in Section 5.

questions, responses were summed by their rated responses (0-'No/None'; 1-'Low/Somewhat'; 2-'Moderate'; 3-'Very/High'; 9-'Don't Know/No Opinion') and multiplied by the respective scale: 0, 1, 2, and 3. The newly rated frequencies were aggregated, divided by the maximum possible score[4], and multiplied by 100 to provide a normalized score on a scale from 0 to 100.

For Section 5 pertaining to relationships, the questions did not involve a scale as described for other sections above. In this case, for comparison across respondent groups, the relative frequency of each activity was determined by dividing the number of times the respondents selected an activity by the total possible times the activity could have been selected. The denominator of total possible times was based on the number of respondents and the total possible number of combinations [$N(N-1)/2$] for nine activities ($N = 9$).

Analysis took place at different subdivisions of respondents by activity group and coast. Activity groups based on the purposive sampling method were used to aggregate respondents. First, each question was analyzed for the respondents overall. The questionnaire was then analyzed through the comparison of tourism, fisheries, and conservation respondent groups. Based on the different dynamics on the east and west coast, there was reason to explore whether there may be differences in responses of east coast and west coast respondents.

[4] Responses of 'Don't Know/No Opinion,' were not included in the normalized score and thus, were removed from the denominator of the 'maximum possible score.'

In order to compare similarity of responses across respondent groups, Kendall rank-order correlation coefficient *(T)* was employed. *T* is a non-parametric measure of correlation for sets of ranked data (Siegel & Castellan, 1988). *T* is a value based on a scale from -1 to 1, with -1 indicating a perfect negative correlation in which the sets of ranked data are inverse to each other and 1 representing a perfect positive correlation where objects receive the exact same ranks (Kendall & Gibbons, 1990).

T is based on the comparison of concordant and discordant pairs across two sets of ranked objects. To apply this correlation, coastal activities were ordered by their normalized score from high to low and subsequently assigned a rank from 1 to 9. To compare two groups of respondents, such as those from fisheries versus those from tourism, activities were ordered based on one group's ranks from high to low (1, 2, 3,…,9) or 'natural order.' The corresponding ranks from the other respondent group form the 'yielding rank order'—note, it does not matter which respondent group forms the natural or yielding set (Siegel & Castellan, 1988). Ranks within the yielding order are individually compared to each other following the direction of natural ordered ranks in group one and are described in terms of discordant and concordant pairs. If an adjacent rank is greater than the rank under observation, the pairs are considered to be concordant or in agreement and are assigned a value of +1. In other words, concordant pairs exhibit a natural order. If an adjacent rank is smaller than a previous rank, it is considered to be 'discordant' or in disagreement and is assigned a value of -1 as demonstrated in Example 1. All of the concordant and discordant pairs are then summed (*S*) and divided by the total number of possible pairs [$N(N-1)/2$] as shown in equation 4.1.

	Bungalows & Guesthouses	Fisheries Enhancement	Coastal Rehabilitation	Snorkeling	Kayaking	Shrimp Gillnet	Squid Trap	MKC National Park	Push Net	
Tourism Respondents	1	2	3	4	5	6	7	8	9	
Conservation Respondents	1	2	3	4	5	7.5	7.5	6	9	Total
	1-->	1	1	1	1	1	1	1	1	8
		2-->	1	1	1	1	1	1	1	7
			3-->	1	1	1	1	1	1	6
				4-->	1	1	1	1	1	5
					5-->	1	1	1	1	4
						7.5-->	0	-1	1	0
							7.5-->	-1	1	0
								6-->	1	1
									9-->	0
									S =	31

Example 4.1: Summation of concordant and discordant pairs. Note, tourism respondents' activity ranks are in natural order and conservation respondents' ranks are in yielding order.

$$T = \frac{\#\text{ agreements} - \#\text{ disagreements}}{\text{total number of pairs}}$$

or

$$T = \frac{2S}{N(N-1)}$$

(4.1)

(Siegel & Castellan, 1988)

When one or more activities have the same normalized score, they are assigned the average of the ranks. For instance in the above example for conservation respondents both shrimp gillnet and squid trap had the same score and thus, instead of being assigned ranks 7 and 8 respectively they were assigned an average between the two ranks: 7.5. When evaluating concordant or discordant pairs, tied ranks receive a value of 0 in the

calculation of *S* (Siegel & Castellan, 1988). When tied ranks occur, the denominator of the above equation (1.1) must be adjusted accordingly. The following equation (1.2) accounts for tied ranks:

$$T = \frac{2S}{\sqrt{N(N-1) - T_x}\sqrt{N(N-1) - T_y}} \tag{4.2}$$

Where *t* is the number of tied ranks and is calculated for variables *x* and *y* by equation (4.3).

$$T_x = \Sigma t(t - 1)$$

$$T_y = \Sigma t(t - 1) \tag{4.3}$$

(Above equations are adapted from: Siegel & Castellan, 1988)

The adjustment for ties produces a coefficient that is marginally different from equation (4.1), unless there is a high proportion of tied ranks or high number of tied observations within a group (Sigel & Castellan, 1988).

T was calculated using the "Kendall" package in RStudio (McLeod, 2011). The p-value generated was based on a 2-tailed test and as direction, positive association, was desired upper-tailed probabilities for small sample sizes were referenced in Siegel and Castellan (1988) Appendix Table R_1 for N = 9. Based on a significance level of 5%, the null hypothesis was rejected if it was greater than 0.05.

Chapter Five

Results

In this chapter, results from field observations and preliminary interviews are presented using the governability framework, to assess the system properties of diversity, complexity, dynamics, and scale associated with tourism, fisheries, and conservation. Given the emphasis of the thesis, additional details of the interactions and relationships between governing actors are also made. Key findings from the survey are then presented for each order of governance. Results of the first order are introduced in reference to relationships among activities as well as their impacts. Next, the second order findings are put forward pertaining to the role activity groups' play in the management of coastal resources. Lastly, the meta-order results are submitted on the motivations and presented as examples of environmental stewardship.

5.1 System assessment

5.1.1 Coastal activities

The properties help to situate the survey relationship results within the greater system. Table 5.1 summarizes the system properties based on the criteria introduced in Table 4.1, with a 'relative' rating of high, medium, or low, assigned to them with their apparent characteristics. For instance, diversity is high for both tourism and fisheries as both consist of small to large-scale operations. Tourism, in particular, varies substantially by east and west coast with the west being highly diverse. Fisheries on the island are predominantly small-scale and are described by a variety of gear-types and target species.

In comparison, conservation is less diverse. Many coastal initiatives have taken place on Koh Chang, but few ongoing are currently operating. Complexity and dynamics are highest among tourism activities and, to a lesser extent, fisheries. Tourism on the west coast, for example, is comprised of many non-local, Thai and foreign workers forming a more complex network of interactions and relationships than fishing villages, where most of the villagers are local and have a greater presence of familial ties. The scale for all three-activity groups is low as the island acts as a natural boundary. The national park border also limits terrestrial development to the island's perimeter and its marine demarcation contains most of the activities.

Table 5.1: System assessment of tourism, fisheries, and conservation activities on Koh Chang

	Tourism	Fisheries	Conservation
Diversity	-Differs by coast with greater diversity on the west coast. -*East coast*: small-scale, locally owned and operated, and nature-based operations. Examples include mangrove boardwalks, kayaking, boat tours, homestays, bungalows and guesthouses. Mostly Thai tourists due to greater language barrier. -*West coast*: local, non-local, and foreign owned and operated businesses. Examples include bungalows and guesthouses, resorts, hotels, cafes, bank machines, bars, convenience stores, scooter rentals, restaurants, souvenir shops, spas, tour agencies, boat tours, sport fishing, snorkeling and SCUBA diving tours, kayaking. -Variety of tourism demographics with more foreign tourists than east coast. ***High Diversity***	-Mostly small and medium-scale boats -*Small-scale gear-types*: shellfish gleaning, shrimp trammel net, fish gillnet, swimming crab gillnet, hook and line, squid trap, crab trap, reef trap, and krill scoop net. Many small-scale fishers participate in several fisheries throughout the year. -*Medium-scale gear-types*: push nets as well as purse seine and cast nets that operate at night using lure lights -Men, women, and youth participate. - -Women, in particular, manufacture value-added seafood products (i.e. shrimp paste, salted fish, and dried squid). - Relatives often comprise the crew to reduce costs. -Supplement income with other work (i.e. farming and tourism) ***High Diversity***	-Mangrove reforestation -Marine protection volunteer group of small-scale fishers monitor for destructive and illegal fishing activity. -Organized underwater and beach cleanups. -Blue-swimming crab bank project located in Klong Son and Salak Phet, supported by the DoF. -DASTA supported recycling, sewage treatment, habitat restoration projects, Kayak Co-operative. -UNEP-led coral restoration sites. -Designated protection under MKCNP. ***Medium Diversity***
Complexity	-*East coast*: Positive relationships among tourism activities; concern about development from outside businesses; local Kayak cooperative in Salak Khok -*West coast*: Greater market competition between businesses; issues of illegal land-development ***High Complexity***	-Many fishers are related and disputes are resolved locally within the community -Positive relationships with middlemen. Middlemen are members of the community and offer fair prices to fishers -Conflict occasionally occurs between small-scale and non-local large-scale fishers due to illegal fishing, and destructive gear types from large-scale operations. ***Medium Complexity***	-Local participation is characterized by positive relationships that support community cohesion and help fishing livelihoods as well as address impacts of tourism. -MKCNP has negative to positive relationships with locals. ***Medium Complexity***

Table 5.1 (Continued): System assessment of tourism, fisheries, and conservation activities on Koh Chang

	Tourism	Fisheries	Conservation
Dynamics	-Seasonal variation with more tourists and businesses operating during the dry season. -Political uncertainty in Thailand can cause fluctuations in rates of visitors. The recent imposition of martial law and subsequent coup d'état in May 2014, as well as months of civil unrest leading up to it, caused countries to issue travel advisories to Thailand. This resulted in a decrease in tourists, even during the high season. -Interaction between east and west coast is low due to the island's mountainous centre and the unconnected main road in the south. Also, vehicles servicing ferry pier service the west coast and most tourists board them upon arrival. -A change in foreign tourist nationalities has occurred over the last decade. Following the Indian Ocean Tsunami in 2004, Koh Chang provided a safe alternative for many European-based businesses. However, in recent years, there has been an increase in Russian, Indian, and Chinese tourists. This has enhanced the language barrier, as many tourists do not speak Thai or, previously more common, English. ***High Dynamics***	-Fishing occurs all year-round with seasonal differences in target species. -Most fishing activity cannot operate in heavy rains and storms during the wet season. -A shift from large and medium to small-scale fishing has occurred over the last 20 years. Larger vessels were too costly to fuel and staff when faced with smaller and smaller yields. -Low level of out-migration of locals from fishing villages. ***Medium Dynamics***	-Projects by external and international organizers have had low sustainability rates when funding ends, such as UNEP-funded mooring buoy committee and local tour guide group as well as maintenance of MKCNP's mangrove boardwalks. -Collaboration and participation occurs among villages for conservation activities. ***Low Dynamics***
Scale	-Most coastal activities are along the coast, such as accommodation and restaurants; marine-activities are close to shore, such as swimming and kayaking, or within travel to other islands within MKCNP (i.e. Koh Rang and Koh Wai). ***Low Scale***	-Fishing mostly takes place within the inshore coastal area within the park. Fishers often fish close to their village. ***Low Scale***	-Most conservation activities are contained within the island or the MKCNP boundary. The artificial reef, HTMS *Chang,* is just outside the national park. ***Low Scale***

5.1.2 Governing actors

At the community level, village heads hold regular meetings and village heads from both sub-districts also meet monthly. Communities coordinate among one another for local events and have relationships of reciprocity. Based on preliminary interviews, the local village heads' relationship with the national park range from positive to negative and are, for the most part, neutral. Some issues village heads have had with the national park include getting projects approved on behalf of their community, the laws being considered unclear and too strict, low maintenance of national park structures, as well as a general perception of low conservation efficacy. The control of illegal fishing activity is perceived to be low due to the park's lack of resources. According to one village head, the national park seems to be unaware of the extent of illegal fishing activity within the park. For instance, they have observed large boats using nets to cover offshore pinnacles as well as prohibited fishing gear operating within the park, such as trawls, purse seines, and push nets.

On the other hand, DASTA works closely with local village heads and Au-Bor-Tor. DASTA does not have authority regarding any rules or regulations. Instead, they act as a coordinator between different agencies and local government as well as a facilitator of projects. It has been a responsive organization to village requests and has supported many community-based projects through training and start-up funds. DASTA has also played an important role in helping to expedite project approval.

DASTA and the MKCNP do not work closely with one another. According to preliminary interviews, MKCNP considers DASTA to initiate projects that are in contradiction to the National Park Act and suggests their goals be more aligned. MKCNP is concerned about the potential impacts proposed conservation initiatives by the villages and DASTA may have if knowledge and skills are inadequate. For instance, there was apprehension towards coral transplantation and uncertainty as to whether coral would be better left to recover without intervention. MKCNP does not have its own natural scientists on staff, but does work with researchers from universities. However, there is often little follow-up with the park. Both DASTA and MKCNP employees, along with village heads, community members, business owners, make up the Mu Koh Chang National Park Committee. The committee meets monthly and enables communication between different stakeholders; nevertheless, little collaboration has occurred between DASTA and MKCNP.

5.2 Questionnaire results

A total of 139 questionnaires were included in the analysis. Table 5.2 shows the general respondent demographics, while a breakdown by tourism, fisheries, and conservation groups as well as location is provided in Table 5.3. Fishing villages on either coast were targeted based on a hypothesis that they may differ based on greater involvement in fishing on the east coast and tourism on the west coast. However, questionnaire results for east and west coasts did not differ significantly according to their normalized scores and correlation analysis.

Table 5.2: Demographic breakdown of surveyed respondents

	Tourism (East)	Fisheries (East)	Conservation	Tourism (West)	Fisheries (West)	Total
Total # of respondents	32	32	16	28	31	139
Male	15	20	12	16	23	86
Female	17	12	4	12	8	53
Age*	26-35; 46-55	56-65	36-45; 56-65	36-45	36-55	-
Level of Education*	Grade 4	Grade 4	Middle School	High School	Grade 4	-

*Represents the mode range
- Not applicable

Table 5.3: Surveyed respondents by location

		Respondent Group			
Coast	Village	Tourism	Fisheries	Conservation	Total
East	Salak Phet	23	18	4	45
	Salak Khok	3	14	2	19
	Dan Mai	6	0	4	10
Sub-total		32	32	10	74
West	Ao Sapparot	2	3	0	5
	Klong Son	3	14	2	19
	Hat Sai Khao	3	0	0	3
	Kai Bae	0	0	1	1
	Bailan	1	2	0	3
	Bang Bao	19	12	3	34
Sub-total		28	31	6	65
Total		60	63	16	139

In addition to the main activity group respondents identified with, they also indicated whether they participated in other tourism, fisheries, and/or conservation activities (Table 5.4).

Table 5.4: Respondent participation in tourism, fisheries, and conservation activities (N = 139) [1]

Tourism (36%)	Tour operations	35%
	Food services	31%
	Accommodation	28%
	Other (i.e. souvenir shops, scooter rentals)	6%
Fisheries (23%)	Small-scale fisheries	63%
	Medium-scale fisheries	26%
	Large-scale fisheries	9%
	Other (i.e. processing, aquaculture)	2%
Conservation (41%)	Community-based activities	65%
	Organized by NGO	14%
	MKCNP operations	13%
	Other (i.e. university-led, other government organizations)	7%

According to the interactive governance framework, interactions, and thus potential for synergy, occur at each order of governance: first, second, and third—or 'meta'—orders. The following sub-sections present the results of the questionnaire pertaining to the three governing orders. In general, the results are described by response frequency and correlation among respondents. Correlation analysis, in particular, was used to indicate similarity in responses among tourism, fisheries, and conservation respondent groups. The strength of correlation was used to infer potential for synergy with stronger correlation indicating greater potential.

[1] Tourism, fisheries, and conservation categories as well as category activities are not mutually exclusive of one another.

5.2.1 First order potential for synergy: Relationships among coastal activities

Overall, in Section 5 of the questionnaire, respondents indicated a greater number of positive relationships among coastal activities than negative relationships. The positive relationships also had a higher level of complexity with multiple connections between tourism, fisheries, and conservation activities. Relationships characterized as negative, by contrast, were less complex as fewer relationships were indicated among activities. Most of the relationships here were concentrated around push net fisheries, with the greatest frequencies occurring between push nets and other fisheries activities: shrimp gillnet and squid trap fisheries.

Complexity among activities is represented in Figure 5.1, where the circle area is proportional to the frequency with which the activity was selected and the width of the line is proportional to the frequency of relationship pairs. In other words, the larger the circle, the more frequent the activity and the thicker the line, the more frequent the relationship between activities. For instance, bungalows & guesthouses and push nets were the most common activities indicated by respondents for positive and negative relationships, respectively.

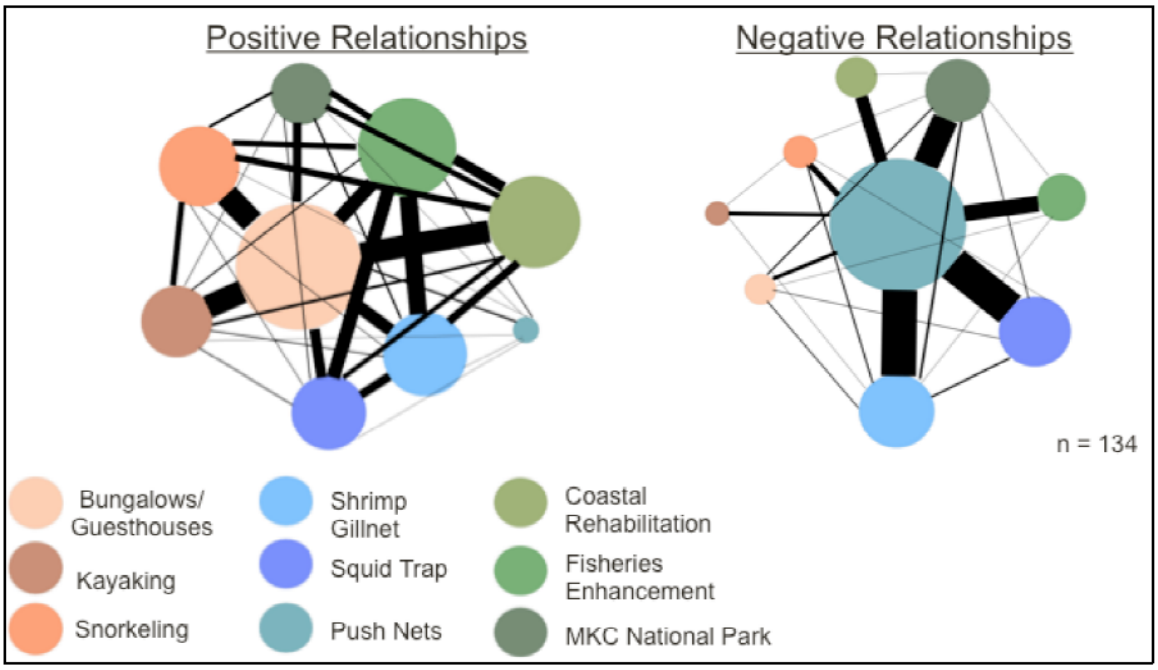

Figure 5.1: Positive and negative relationships among coastal activities

Table 5.5 represents the positive and negative relationship pairs of activities. In each cell, the number of times respondents paired a set of activities "positively" over the total number of respondents (N=134) is shown above the diagonal line as a percentage. In the same way, the other value is the percentage of the "negatively" paired activities. The highest proportion of positive relationships involves bungalows & guesthouses with other tourism activities, i.e. snorkeling and kayaking. For fisheries activities, shrimp gillnet and squid trap fisheries have a high proportion of positive relationships with conservation's fisheries enhancement. On the other hand, push net fisheries have a low proportion of positive relationships across all activity groups and the highest proportion of negative relationships, particularly among other fisheries activities.

Table 5.5: Proportion of positive and negative relationships (+/-) (N = 134)

	Bungalows & Guesthouses	Kayaking	Snorkeling	Shrimp Gill Net	Squid Trap	Push Net	Coastal Rehabilitation	Fisheries Enhancement	MKCNP
Bungalows & Guesthouses									
Kayaking	42.5 / 0								
Snorkeling	43.3 / 0	11.2 / 0.8							
Shrimp Gillnet	23.1 / 2.2	2.2 / 0.8	1.5 / 3.0						
Squid Trap	18.7 / 1.5	2.2 / 0	1.5 / 0.8	16.4 / 3.7					
Push Net	3.7 / 7.5	0.9 / 7.5	0.8 / 11.2	0.8 / 62.7	0.8 / 62.7				
Coastal Rehabilitation	40.3 / 0	5.2 / 0	12.7 / 0	14.9 / 0	9.0 / 0	0 / 23.1			
Fisheries Enhancement	25.4 / 0.8	3.0 / 0	10.5 / 0	32.1 / 0.8	24.6 / 0	2.2 / 28.4	20.2 / 0.8		
MKCNP	15.7 / 3.0	1.5 / 0	5.2 / 0.8	3.7 / 4.5	2.2 / 2.2	0.8 / 45.5	10.5 / 0	11.9 / 0.8	

The level of association between tourism, fisheries, and conservation respondent groups was tested with Kendall rank-order correlation coefficient (*T*) (Table 5.6). The association of positive relationships was strongest among tourism and conservation respondents. Fisheries and conservation respondents were not significantly correlated. In comparison, there was a strong correlation among all respondent groups regarding negative relationships.

Table 5.6: Kendall rank-order correlation coefficient among tourism (T), fisheries (F), and conservation (C) respondents for positive and negative relationships

		T	F	C
Positive Relationships	T	-	-	-
	F	0.611*	-	-
	C	0.873*	0.479	-
Negative Relationships	T	-	-	-
	F	1.00*	-	-
	C	0.915*	0.915*	-

* p value < 0.05

In addition to positive and negative relationships, respondents also indicated which pairs of activities they would like to see engage in greater collaboration for environmental stewardship. Aside from push net fisheries, which had the lowest overall occurrence in relationship pairs, tourism and fisheries were paired the most with conservation activities. Among tourism-conservation pairs, coastal rehabilitation was the most preferred conservation activity (38%), followed by fisheries enhancement (33%), and MKCNP (29%). For all fisheries-conservation pairs, preference for greater collaboration was greatest for fisheries enhancement activities (48%), then coastal rehabilitation (32%) and to a lesser extent, MKCNP (20%).

5.2.2 First order potential for synergy: Positive and negative impacts

The first order of governance was also analyzed based on the economic, social, and ecological impacts coastal activities have on Koh Chang. Similar to the positive and negative relationships, positive impacts surpass negative ones for all activities, with the exception of push net fisheries. Further, respondents recognized the contribution other activities have to the island, aside from their own. Each activity was considered generally to have negative impact, although at a much lower level. In this case, respondents also indicated negative impacts within their activity group as well as in other activity groups.

The positive economic, community, and ecological impacts are represented in Figure 5.2. Among each tourism activity as well as shrimp gillnet and squid trap fisheries, the level of positive impacts is similar, with economic and community being slightly higher. Push net fisheries had a greater level of economic and community positive impact than ecological. For conservation activities, the proportion of positive impacts was even across all three dimensions.

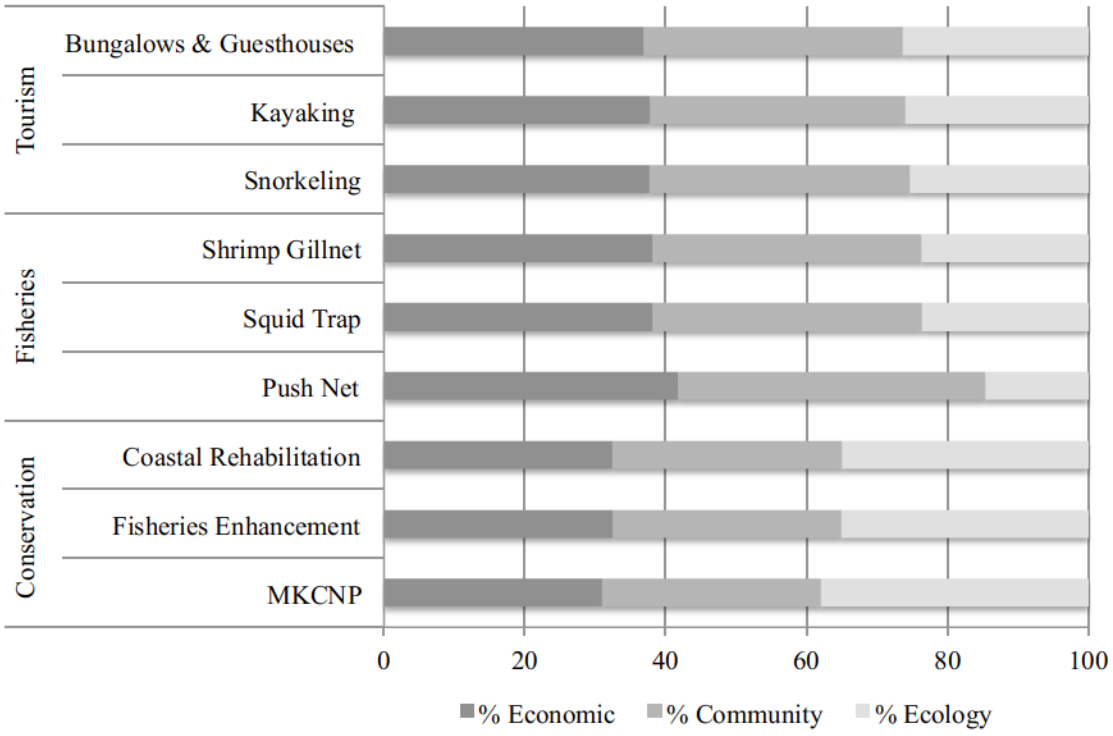

Figure 5.2: Positive economic, community, and ecological impacts of activities

Negative impacts for tourism activities as well as shrimp gillnet and squid trap fisheries were also similar across dimensions, with the highest impact on ecology (Figure 5.3). For push net fisheries, the ecological impact is still the greatest, but in comparison to other activities, there is a relatively higher proportion of community and economic negative impacts. Similar to the positive impacts, coastal rehabilitation and fisheries enhancement are more evenly spread across economic, community, and ecological impacts. MKCNP, in contrast, has a higher proportion of economic and community negative impact than ecological.

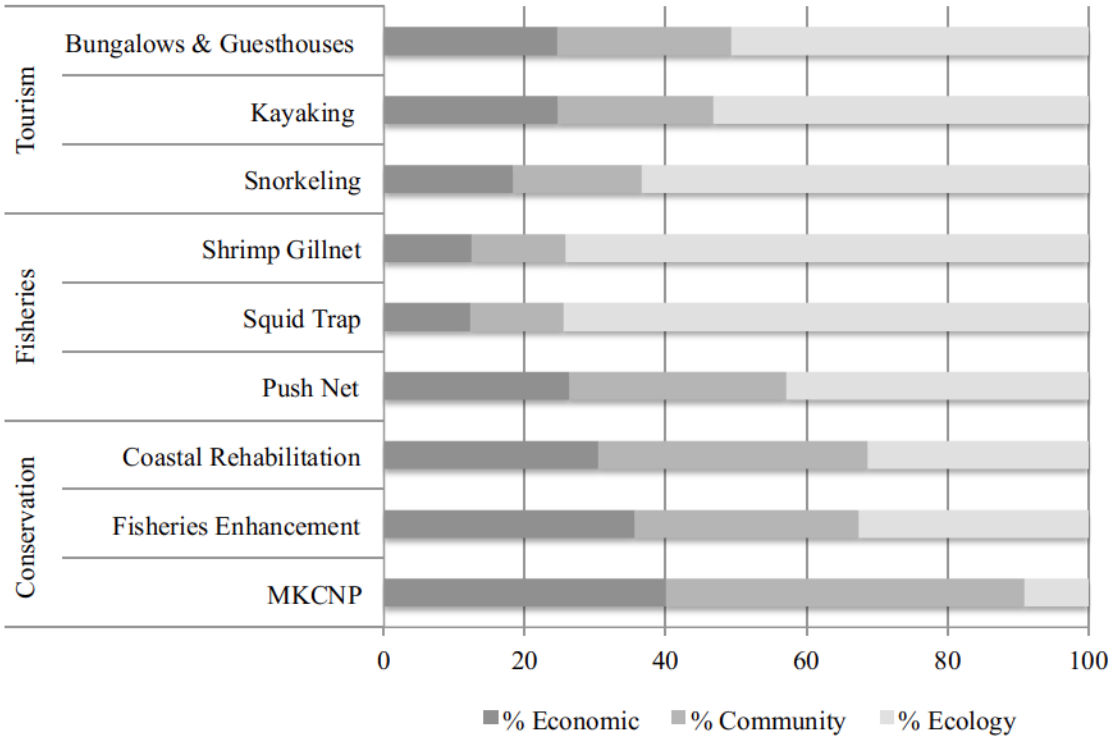

Figure 5.3: Negative economic, community, and ecological impacts of activities

Correlation among tourism, fisheries, and conservation respondent groups using Kendall rank-order correlation coefficient is represented in Table 5.7. Across respondent groups, both positive and negative economic impacts had the lowest level of association, followed by community impacts. There was high correlation among respondent groups for ecological impacts. In general, correlation among respondents was higher for negative impacts than positive impacts.

Table 5.7: Kendall rank-order correlation coefficient among tourism (T), fisheries (F), and conservation (C) respondents for positive and negative activity impacts

		Economic			Social			Ecological		
		T	F	C	T	F	C	T	F	C
Positive Impact	T	-	-	-	-	-	-	-	-	-
	F	0.647*	-	-	0.751*	-	-	0.857*	-	-
	C	0.171	0.353	-	0.269	0.54*	-	0.899*	0.957*	-
Negative Impact	T	-	-	-	-	-	-	-	-	-
	F	0.858*	-	-	0.691*	-	-	0.955*	-	-
	C	0.537*	0.344	-	0.717*	0.525*	-	0.657*	0.697*	-

* p value < 0.05

5.2.3 Second order potential for synergy: Role of activity groups in coastal management

The second order of governance pertains to governing institutions. In this study, activities were aggregated by their respective groups of tourism, fisheries, and conservation, and were assessed based on the role they played in the management of coastal resources. This was indicated by the level of influence respondents perceived activity groups to have. In order to speak to the legitimacy of activity groups' role in management, the perceived current level of influence was compared to the level respondents considered more appropriate.

Overall, respondents differed slightly in their perceptions (Figure 5.4). Activity groups, overall, were seen to have relatively equal participation in resource management. When based on individual activities, push nets again were found to differ the most and demonstrated a lesser management role. Further, about 80% of respondents considered the current level of influence activities have in management to be appropriate. When there was disagreement, the trend for each activity, including push net fisheries, was to increase the level of influence. The greatest change in scale occurred for push net fisheries where

the scale representing the "more appropriate" level of influence more than doubled its current level of influence.

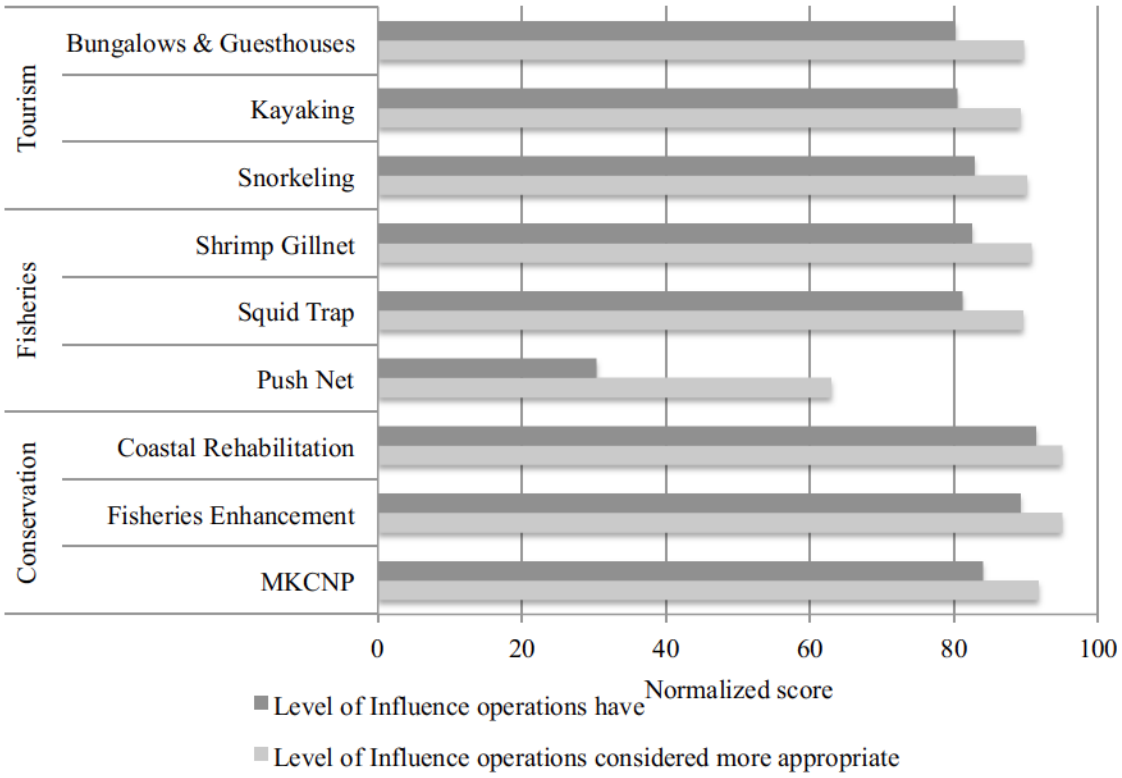

Figure 5.4: Level of influence respondents consider activities to currently have in coastal resource management compared to the level of influence respondents consider appropriate (N = 139)

5.2.4 Meta-order potential for synergy: Motivations and examples of stewardship behaviour

The meta-order addressed the environmental motivations for governance. First, different environmental values were rated (Figure 5.5). The overall rating was high for all groups with little differentiation. Values with the highest rating (93%) include biodiversity, moral responsibility, 'the right thing to do,' and sufficiency economy, a Thai

principle of taking what you need and not more. The lowest values were still high (at about 80% each) were education and spiritual/ religious belief.

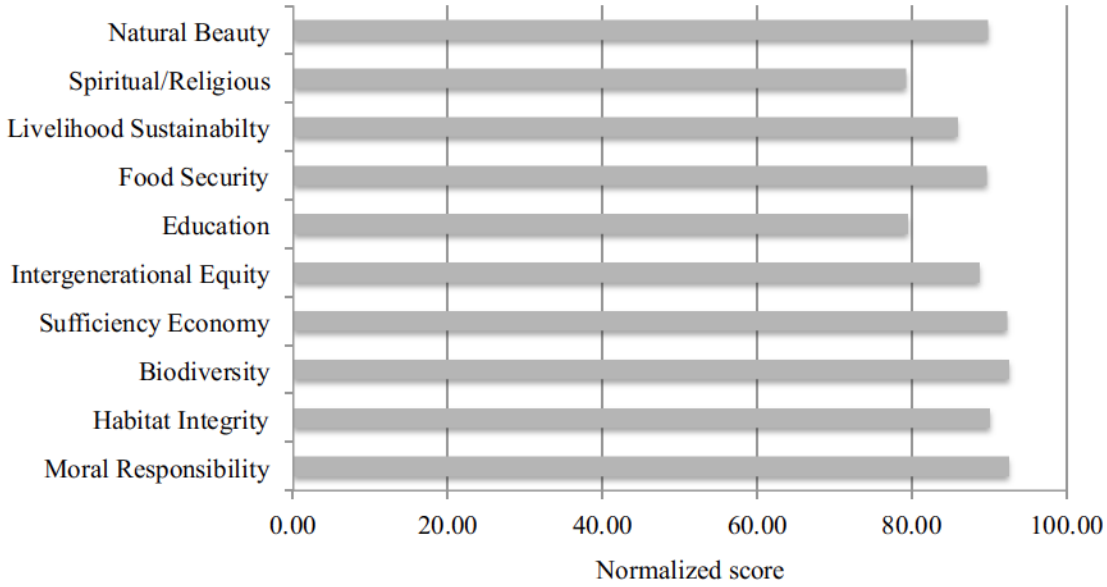

Figure 5.5: Motivations level of importance for environmental governance (N = 139)

Respondents were also asked to provide examples of stewardship behaviour that tourism, fisheries, and conservation activity groups exhibit on the island. These examples fall into the following categories: ecological recovery, waste management, sustainable tourism practices, sustainable fishing practices, community engagement and collaboration, and other. In general, similar examples were provided across tourism, fisheries, and conservation respondent groups (Figure 5.6). Conservation respondents provided the highest level of stewardship examples of tourism and fisheries activities and all respondent groups were able to provide examples of conservation activities' stewardship behaviour on the island.

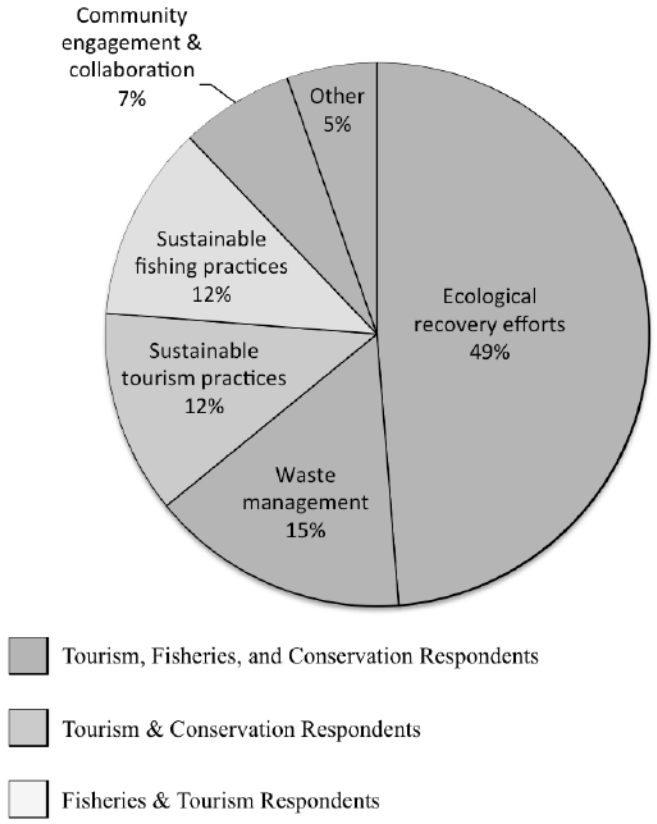

Figure 5.6: Categorical examples of stewardship behaviour as provided by tourism, fisheries, and conservation respondents.

In summary of the key findings, at the first order the quality of relationships and impacts had a greater occurrence of being positive rather than negative. Questions pertaining to relationships, in particular, were found to show the greatest variation among coastal activities. For the second order, activity groups were indicated to have a similar level of influence in coastal resource management with a high level of agreement in the appropriateness of the activity group's governing role. At the meta-order, the importance of environmental values was highly rated and respondents provided similar examples of stewardship behaviour on the island.

Chapter Six

Discussion

The first two sections of this chapter provide an interpretation of the study's results starting with a discussion of potential for synergy according to the three governing orders followed by synergy pertaining to tourism, fisheries, and conservation activity groups. The key findings are then more broadly discussed drawing from relevant governance and stewardship literature. Synergy among stakeholders is discussed in terms of its implications for ICM and conduciveness to stewardship as well as the role integrated institutions can play in fostering synergy. Lastly, limitations of the study are presented as well as a discussion of methodological considerations.

6.1 Governing orders and potential for synergy

Potential for synergy was assessed based on the three orders of governance. To review, the first order describes day-to-day problem solving activities, which are situated within the second order of institution building, and the meta-order pertains to the meta-physical aspects, such as values, images, and principles, which ultimately guide governance (Kooiman et al., 2008). An assessment of all three orders is important because together they can identify challenges and/or potential for synergy under different governance considerations. Disagreement among respondents' perceptions of institutions may, for example, identify misrepresentation or favouring of certain stakeholders over others, which might help to explain problems that arise at the first order. Identifying areas of agreement, on the other hand, can form a common ground from which collective action

can be fostered among stakeholders. In this study, particular attention was given to the potential for synergy at the first and second orders, which could, over time, enable greater expression of meta-level aspects, such as the ethic-based principle of stewardship.

6.1.1 First order

Relationships among activities characterized as compatible and supportive are assumed to have a greater likelihood of forming a foundation for synergy among stakeholders than those that are negative and conflicting. Based on positive relationships being more prevalent than negative relationships, potential for synergy can be said to exist among tourism, fisheries, and conservation activities. Potential for synergy is also indicated by positive relationships connecting across, rather than being confined within, tourism, fisheries, and conservation activity groups. Similarly, a scenario that is more conducive to the formation of synergy is illustrated by positive impacts outweighing the negative impacts to economic, social, and ecological considerations on Koh Chang.

It is recognized, and perhaps common knowledge, that all social systems are comprised of actors and groups that have relationships and impacts that are both positive and negative in nature. However, comparisons of conflict and compatibility are few. In the case of Koh Chang, the positive linkages and impacts are much greater than the negative and may indicate a source of capacity for collaboration, which is an indication of synergy. According to the governability framework, greater complexity indicates a less governable system (Jentoft & Chuenpagdee, 2009). However, the findings demonstrate that a high level of complexity in a system can hold potential for synergy, which would

instead increase governability. Attention to the quality of relationships plays an important role in interpreting complexity as positive and mutually beneficial relationships create a system more conducive to governance and stewardship behaviour.

Historically, problems and negative interactions attract greater attention than the strengths a system already holds (McKnight, 1997)—such as those explored in this study through potential for synergy. It has been argued here that disagreement and conflict also seem to take precedence over supportive and mutually beneficial relationships within coastal conservation discourse. This focus, in turn, informs management strategies to mitigate conflict while doing little to harness existing capacity. Capacity, in general, has attracted less attention from a management perspective as strategies are often fuelled by motives of immediacy and demonstrable results (Feeley et al., 2008). Based on stakeholder relationships from Koh Chang, it is perhaps because conflict is often more obvious than synergy. In other words, compatible relationships garner less attention than those that disrupt the status quo. For instance, the majority of negative relationships were centered on push net fisheries. There was also a strong correlation among respondents for questions pertaining to negative relationships. Positive relationships, in contrast, lacked a clear pattern due to the high level of complexity and diversity. Additionally, responses regarding positive relationships had either had a weaker association or were not significantly correlated.

6.1.2 Second order

The current level of influence in coastal management is relatively even among activity groups with a high rate of respondents perceiving the level of influence as appropriate. This suggests greater potential for synergy on Koh Chang compared to a hypothetical alternative scenario wherein select groups were perceived to have greater influence than others accompanied by a high rate of disapproval.

Again, results of push net fisheries differ markedly compared to the other activities. Here, push nets were found to have the least influence. However, respondents indicated that they should play a greater management role, despite push nets having the highest level of negative relationships and impacts. Instead of excluding push nets through reducing the level of influence they currently exhibit, they are included. Increasing the influence of push net fisheries represents an environment more conducive to synergy formation—one in which otherwise unfavourable activities can potentially be a part of the solution. In the case of Koh Chang, this may eventually lead to a decline in the use of destructive fishing gears or enable alternatives to be more readily explored by engaging with fishers using push nets. Greater participation in problem solving, in general, can enhance the quality of decisions made for a greater number of stakeholders (Hertel, 2011).

6.1.3 Meta-order

The high level of agreement among environmental motivations and similarity in examples of stewardship behaviour on the island suggested that, at the meta-level, there is

potential for synergy among respondents. Motivations, represented here by different environmental values, are normative in nature, which explains the high ratings among respondent groups. Even so, they still provide insight into motivations that connect respondents overall. The top values of biodiversity, moral responsibility, and sufficiency economy all align with stewardship behaviour. Stewardship, for instance, has greater potential when rooted in ecological and social value-orientations than those of an egoistic or economic emphasis (Berry, 2006; Worrell & Appleby, 2000). 'Sufficiency economy,' in particular, is a unique concept found in Thailand, which is demonstrated within this case study, to support environmental stewardship. Drawing from the social component of stewardship based on altruism for others (Berry, 2006), sufficiency speaks to taking enough to satisfy the needs of a person or household without compromising the ability of others to do the same (Chuenpagdee & Juntarashote, 2011).

Examples of stewardship behaviour respondents provided for tourism, fisheries, and conservation activity groups were also used to evaluate agreement at the meta-level. Here, the examples provide insight to the awareness respondents' have of other stakeholders in addition to their own activity group. A high rate of awareness respondents have for pro-environmental activities on Koh Chang points to common understandings of how others care for the environment, which in turn supports synergy potential among respondent groups. More specifically, respondents were found to be more aware of conservation activities than those of tourism and fisheries. This, accompanied by conservation activities being associated with a high level of positive relationships and support for greater collaboration among tourism and fisheries activities, suggests that

conservation—the most eco-centred activity group—plays an important role on the island for enabling stewardship behaviour. Not all conservation activities, however, exhibit the same potential with coastal rehabilitation and fisheries enhancement appearing to form stronger ties than MKCNP.

The concept of stewardship is inherently normative and thus, respondents' knowledge of other activities' actions reflects their acknowledgment of environmentally beneficial behaviour different groups partake in on Koh Chang. From the examples of stewardship respondents provided, there was also an overlap in the types of activities conducted. For instance, for the categories created based on similar themes in stewardship examples, each category represented at least two of the three activity groups with the majority representing all three. From this, it can be inferred that the three groups have similar ideas of what groups must do in order to care for the environment and to mitigate human impacts in general.

6.2 Summary of potential for synergy among activity groups on Koh Chang

6.2.1 Tourism

Certain activities may differ in their potential of being involved in, or perhaps even instrumental to, synergistic relationships. In the case of Koh Chang, bungalows and guesthouses represent a tourism activity with the most positive relationships within tourism, and across fisheries and conservation activity groups. From a theoretical perspective, it may seem more likely for the other tourism activities in the survey, i.e. kayaking and snorkeling, to form stronger ties with fisheries. For instance, fishers'

nautical and ecological expertise is often cited as enabling them to pursue guiding and boating positions in tourism activities (Young, 1999; Cruz-Trinidad et al., 2009). In the context of Koh Chang, there are important ties between fishers and kayaking and snorkeling activities as demonstrated by their involvement in the kayaking cooperative and the conversion of large-scale boats for tourism purposes following the shift from large-scale to small-scale boats (Table 5.1). Nonetheless, bungalows and guesthouses appear to play a stronger role for synergy among all three activity groups, perhaps due to their ubiquity around the island. This supports the need for a careful consideration of relationships within the local context as potential for synergy may be more likely between different components, but cannot be assumed beforehand (Nevo & Wade, 2010).

Although tourism activities vary by coast, in terms of diversity, and complexity (Table 5.1), respondents and village heads from both sides expressed positive perceptions of tourism on the island, particularly in regards to its benefits to Koh Chang's economy. Prior to tourism development on the island, there were few alternatives for locals who were experiencing poor fishing yields (Personal Communication, Village Head, 2014). However, the ecological impacts of rapid tourism development are still an important concern. Impacts from tourism activities include coastal erosion, clearing of mangroves, waste, untreated sewage, water shortages, and the trampling of coral. In order to mitigate tourism impacts, engagement in conservation activities and support for DASTA-led initiatives for sustainable tourism were indicated in the survey. The villages on the east coast prefer to keep tourism small-scale, within the community, to prevent outside

ownership and large-scale development associated with greater ecological impact as is experienced by the west coast.

6.2.2 Fisheries

The potential for synergy among fisheries activities was greatest among shrimp gillnet and squid trap fisheries. Both had positive relationships that connected across activity groups. Results also indicate that they contribute to the island through positive impacts to the local economy, community, and ecology of Koh Chang. Some examples of ecological contributions fishers have on the island involve best practices in fishing, such as not using fine mesh sizes, returning egg-bearing animals, abiding by temporary closures to protect juvenile species, and participating in conservation activities. However, the results also illustrate that not all fisheries can be generalized. For example, all respondent groups, including fishers, had a high level of agreement that push net fisheries have negative impacts. Push nets had a high level of negative impacts and relationships—particularly with other fisheries and conservation activities.

A possible reason for the poor rating of push nets is that they are recognized as a destructive fishing gear and are currently banned from operating in nearshore areas. Push nets are used for fishing shrimp, but are a non-selective gear type with fine mesh sizes which catch juveniles and cause damage to bottom habitats due to their contact with the seafloor (Morgan & Staples, 2006; Vo et al., 2013). All fishing activity is technically prohibited within park boundaries, but it is generally accepted among authorities that small-scale fishing is permitted (Lunn & Dearden, 2006b). Unlike other 'small-scale'

fishing activities, such as shrimp gillnets and squid traps, push nets are further restricted by the DoF, which limits their operation within 3km of coast (Morgan & Staples, 2006).

Additionally, many of the push nets operating in nearshore areas are medium to large in scale based on larger vessel and motor size. Further, the number of large-scale push nets observed operating in shallow areas on calm days were greater than those observed moored at the village wharfs. Thus, there is potential that some of the boats come from mainland Trat to fish and are not located on Koh Chang, which may engender tensions based on sense of territory.

6.2.3 Conservation

Of the conservation activities, fisheries enhancement and coastal rehabilitation were associated with greater potential for synergy based on respondents' high ratings of positive impact and relationships. Potential for synergy varies between activity groups as 'supportive or mutually beneficial' relationships were greater between coastal rehabilitation and tourism activities while fisheries enhancement were greater with fisheries activities. MKCNP, on the other hand, appears to have less synergy potential due to a greater level of economic and social impacts as well negative relationships in comparison to the other conservation activities in the survey.

Accompanied by respondents' positive perceptions of conservation activities, 41% (Table 5.4) also participated in some form of conservation activity. Similar to tourism, conservation has been seen as a means to regenerate community cohesion when fishing

communities were faced with declining fish stocks (Personal Communication, Village Head, 2013). In order to tap into the strengths social systems may have, identification of a common concern can be conducive to creating synergy. Motivation for stakeholders to unite, coupled with existing positive relationships enables greater potential for stewardship behaviour (Meidinger, 1998). Environmental problems, in particular, can motivate groups to work together. Although specific problem definition and associated implications likely vary among stakeholders (Jentoft et al., 2010), it is generally agreed that a healthy, functioning coastal environment benefits coastal stakeholders through the provision of ecosystem services. When services are threatened, they can motivate groups to work together to address them. On Koh Chang, respondents had a high level of agreement on questions pertaining to the environment, such as those pertaining to environmental values, awareness of conservation activities, and participation in conservation activities, as well as for greater collaboration for environmental care.

The high potential for synergy on the island, in general, is likely affected by the system property of scale being relatively low for all activity groups (Table 5.1). System boundaries that are smaller, and more contained, are considered to be more governable than those that are larger and more fluid (Chuenpagdee, 2011a). Due to its island setting, Koh Chang is more isolated than a coastal system based on the mainland. As with the concept of governability, perhaps opportunities for synergy are greater in systems where interactions and relationships are bound within a smaller space.

Overall, potential for synergy varies by governing order as well as within and among different activity groups, which demonstrates the need for a holistic approach. Corning (1998), for example, posits that common expressions to describe synergy, such as *a whole that is greater than the sum of its parts* or '2 + 2 = 5', fail to adequately articulate the concept of synergy. Instead, he prefers "the effects produced by wholes are different from what the parts can produce alone" (Corning, 1998, p.136). Thus, synergy cannot be studied based solely on components, but also requires attention to the relationships among components—which invariably differ from place to place (Nevo & Wade, 2010). In other words, emergent properties are unique products of a *system* (Nevo & Wade, 2010; Von Bertalanffy, 1972).

6.3 Integrated coastal management: Synergy among coastal stakeholders

ICM challenges the sector-by-sector, reductionist standard and acknowledges the inherent dynamism and complexity of coastal areas represented by a myriad of ecological and social interactions (Le Tissier et al., 2011; Cicin-Sain & Knecht, 1998). Stemming from this understanding, this study argues that greater attention to stakeholder relationships is an important aspect of coastal governance. Positive and supportive relationships, specifically, are more conducive to synergy wherein opportunities and emergent capabilities may lie. This section builds upon this argument based on findings from Koh Chang. First, the positive linkages among tourism, fisheries, and conservation activities as well as the element of 'care' found at the local, community level are explored in terms of their implications for environmental stewardship. A discussion then follows of the role of integrated institutions in fostering synergy.

6.3.1 Positive relationships among tourism, fisheries, and conservation activities

In general, relationships among coastal activities cannot be assumed to be antagonistic or in conflict with one another based on their different uses or interests within the coastal zone (Bavinck et al., 2005; Jentoft, 2007). As Koh Chang's multiple-use coastal area demonstrates, tourism, fisheries, and conservation activities not only co-exist, but also have relationships characterized as supportive and mutually beneficial. In opposition to Hardin's (1968) tragedy of the commons, this study supports Ostrom's (1990) argument that relationships cannot adequately be described by a zero-sum game alone. The concept of synergy follows the basic premise that more can be achieved through collective, rather than individual, effort (Nevo & Wade, 2010)—some of which may result in mutual benefits (Corning, 2014). Conversely, relationships as depicted by Hardin consist of one user's gain equating to another's inevitable loss.

In the case of Koh Chang, tourism, fisheries, and conservation activities were all considered, in varying degrees, to be of importance to the island's socio-economy and to be engaged in positive relationships within and across stakeholder groups. Contrary to the common portrayal of tourism and conservation as being more complementary activities and small-scale fisheries fulfilling a role of dependency (Segi, 2014), small-scale fishers were found to have positive contributions to the island. This aligns with a growing body of literature centred on small-scale fishing that supports their importance to coastal communities in respect to food security, livelihood sustainability, culture and conservation (Kooiman et al., 2005; Bavinck et al., 2005; Chuenpagdee, 2011b).

Similarly, Segi (2014) criticizes conservationists and policy makers for perpetuating a simplistic view of small-scale fishers. For instance, he refutes the notion that small-scale fishers *need* encouragement to behave in an ecologically conscious manner. Instead, the dependency small-scale fishers have on healthy ecosystems and their frequent interaction with coastal ecosystems position them as ideal candidates for environmental stewards (Roach, 2000; McConney et al., 2014). Further, the intrinsic value of nature cannot also be assumed to be absent simply because they engage in a so-called 'extractive activity.'

Small-scale fishers—unlike large-scale industrial fishers, managers, and politicians—interact with coastal ecosystems on a daily basis and have a vested interest in their overall health in terms of livelihood dependency and food security (Bavinck et al., 2005). Instead, it is the regulators or managers who are often charged with the responsibility of maintaining ecosystem health and the contribution fishers make or could make is thereby underestimated (Soliman, 2014). Harnessing the capacity of small-scale fishers is important for supporting sustainable fisheries as well as helping safeguard coastal ecosystems and communities against environmental threats (McConney et al., 2014). On Koh Chang, small-scale fishers exhibit stewardship behaviour without the need for formal intervention. For example, fishers coordinate to monitor and report illegal fishing activity within the national park, to participate in mangrove restoration, a voluntary crab bank program, and to request training for more technical efforts, such as coral transplantation (Personal Communication, Village Head; National Park Employee,

2014). Fishers, along with tourism and conservation respondents also recognize 'sufficiency economy.' This well-known concept within Thailand supports sustainable use of resources and the ability for others to meet their needs and thus, acts to prevent resource exploitation (Chuenpagdee & Juntarashote, 2011). As described in the meta-order of governance above, sufficiency economy was indicated as an important consideration for coastal governance in Koh Chang that aligns with stewardship.

However, it is also recognized that certain/some small-scale fishing gears can have damaging ecological impacts (Segi, 2014). Ruddle (2014) criticized recent literature that appears to overlook destructive gear types, such as blast fishing and fine mesh sizes, in an effort to set small-scale fisheries apart from large-scale commercial fleets. He argues this creates a greened or romanticized view of small-scale fisheries without attention to their impacts, especially within developing countries. However, tendencies towards participating in unsustainable practices are likely not a result of inadequate knowledge or disregard for ecosystems or others, but rather stem from circumstances of few economic alternatives and low political power (Segi, 2014). The following section elaborates the role institutions play in enabling or disabling synergistic relationships for environmental stewardship.

6.3.2 Integrated institutions

Positive relationships are explored in this study as the building blocks of synergy. However, synergy does not necessarily have to be *created* by external agencies. Instead, institutions should be tailored to foster and nurture positive relationships found within a

place that may lead to, or represent, unrealized synergy. This builds upon available capacity within a place and can lead to greater community involvement and participation in the governance of coastal resources (Jentoft, 2000). For instance, at the community level, there is a greater likelihood for connections to exist among members as they share common ties based in history, traditional values, sense of social responsibility, and norms, which can represent a source of capacity (Jentoft, 2000; Jentoft & Buanes, 2005). However, institutions often do not acknowledge such strengths found within communities (McKnight, 1987). In turn, institutions can inadvertently harm them and even cultivate a scenario as described by Hardin in which competition among stakeholders is motivated by individual gains (Jentoft, 2000). Further, when ties of familiarity among actors are few, the tendency for zero-sum relationships increases due to a heightened sense of anonymity (Lejano & de Castro, 2014). Lejano and de Castro (2014) argue that it is often due to institutions that people are not encouraged to act according to their 'authentic selves' when norms of empathy and fairness are not valued as attributes of strength.

Building upon Ostrom's argument, Lejano and de Castro (2014) posit that motives for cooperative action can extend beyond strategic advantage and be a product of 'other regarding' behaviour. For instance, stakeholders may act altruistically, without an underlying intention of gaining from shared benefits. In some cases, people may even willingly accept personal loss in order to benefit others (Lejano & de Castro, 2014). McKnight (1987) supports communities as the appropriate medium to study relationships based on *care*. He argues *care* represents a special type of relationship, which stems from *consent,* an attribute generated from communities, rather than *control* born from

institutions (McKnight, 1987). Altruistic behaviour through support and care for others can lay a foundation for environmental stewardship in contrast to systems in which economic incentives and self-interest prevail (Westphal et al., 2014; Barry & Smith, 2008). Care, a deep cultural norm, also underpins stewardship behaviour itself by promoting humans' duty to take care of nature (Nassauer, 2011). With this understanding, there is motivation to explore stewardship potential at the local level.

Further, locals have greater tendency to partake in stewardship behaviour based on their sense of place (Cantrill, 1998). Sense of place can be described in terms of both *place affection* and *place dependency*, in which the former stems from an emotional and aesthetic connection and the latter pertains to meeting one's needs (Imran, 2014). Tourism and fisheries activities likely differ in their attachment to place, with fisheries having a greater dependency on coastal ecosystems for their livelihood and food security (Chuenpagdee et al., 2013). Tourism activities, on the other hand, often have greater capacity to leave and re-establish elsewhere if ecosystems become too degraded. However, tourism stakeholders cannot be generalized, as on Koh Chang both local and non-local/foreign stakeholders participate in tourism activities. Local tourism stakeholders from fishing villages, in particular, may have a greater attachment to the island and face some of the same financial difficulties of relocating as fishers.

Thus, institutions must be adaptive, flexible, and more responsive to foster stewardship tendencies than those that are fixed and rigid (Barry & Smith, 2008). Responsive and interactive institutions can better address the idiosyncrasies of a social

system because relationships among coastal stakeholders are inherently unique based on local contexts (Gasalla, 2011). Prominent governing actors on Koh Chang, for instance, vary in their ability to encourage synergistic relations among coastal activities, whether it is by flexibility, resources, or level of integration. The role of the local government, MKCNP, and DASTA are elaborated below in greater detail.

At the local level, village heads and local administration leaders engage and interact in frequent meetings (Personal Communication, Village Head, 2014). Village heads represent their community and seek additional support to address requests and problems put forth by members. In terms of conflicts among stakeholders, many of the community members are related in some way, particularly in the cases of fishing villages on the east coast, Salak Khok and Salak Phet. There, conflicts are often addressed at the family level or village-level without need for intervention from outside (Table 5.1) (Personal Communication, Village Head; National Park Employee, 2014). The household level itself can play an important role in enabling synergy (Evans, 1996), particularly in contexts like Koh Chang where family relations are prevalent in communities. MKCNP and DASTA, however, differ considerably in their recognition and utilization of local capacity as they originated from different goals and were established on Koh Chang through a distinctly different approach.

The establishment of the MKCNP followed the national mandate of marine and coastal conservation in order to enable education, recreation, and tourism activities. Its initial implementation was characterized as top-down and followed in similar suit of other

marine national parks in Thailand (Jentoft et al., 2011). The main driver to develop MPAs, in general, originated from an ecological standpoint (Degnbol et al., 2006). The widespread trend for spatial protection of marine and coastal areas resulted in the implementation of MPAs being predominantly imposed upon coastal and marine areas by external, non-local agencies (Christie, 2004). While social benefits and concerns have become an important part of the contemporary discourse in coastal conservation, such as the provision of vital ecosystem services, they were not a key consideration from the outset (Eadens et al., 2009). Beyond local stakeholder support or 'buy-in,' there is still little recognition of stakeholders' contribution to conservation efforts. This is evidenced by 'no-take' marine reserves representing the most optimal MPAs for conservation (Lester et al., 2009). In consequence, they can have lingering legacies of community exclusion or fail in enforcement and become paper parks (Chuenpagdee, 2011a). MKCNP, arguably, has characteristics of a paper park as it has little capacity to monitor, enforce, and implement coastal restoration and awareness projects. There is also concern over the allocation of park resources towards conservation efforts from the revenue the park does generate through park fees. One village head described the coastal environment to be better off without national park designation.

MKCNP is limited in resources and does not currently organize any specific conservation projects. However, MKCNP is not as top-down of an institution as it was upon implementation, due in part to Thailand's decentralization of governing responsibilities in 1997 (Jentoft et al., 2011). A protected area committee, for instance, now exists and is comprised of multiple stakeholders, including tourism operators, village

heads, and representatives from DASTA. Relationships between the villages and national park were neutral with one out of the four interviewed village heads reporting conflicts with the national park. The others, did not have conflicts per se, but did not report benefits either. This is also reflected in the survey results pertaining to compatible relationships, where MKCNP had few relationships with tourism and fisheries activities. Two criticisms among village heads were in regards to the park rules and conservation effort. The park was criticized as having too many rules that lacked transparency, and in some cases seemed too strict. As for conservation, the general opinion expressed among village heads and tour operators was that the park did little for conservation as large-scale fishing vessels using trawls, push nets, and purse seines frequented waters within the park boundary without penalty. In general, MKCNP currently exhibits little capacity to harness the strengths that exist among coastal stakeholders to enable synergy.

DASTA's establishment, on the other hand, was the first of its kind in Thailand as Koh Chang was selected as the nation's pilot study. Thus, DASTA's formation on the island was tailored more specifically to Koh Chang's local context than MKCNP. Over the past decade on the island, DASTA has been instrumental in the development and facilitation of numerous projects on Koh Chang. Based on preliminary interviews with village heads, DASTA has positive relationships with the local administration. In collaboration with villages, DASTA holds monthly public meetings. DASTA is also responsive to village requests and acts as a facilitator for mobilizing projects. They provide initial funding and training to get projects started. As DASTA is a pilot project and was not intended to be based on Koh Chang indefinitely, they try to encourage the

projects to become self-sustaining within the community. Thus, they emphasize knowledge building and supply funding only during the project's startup phase. DASTA's overarching mission is to promote sustainable tourism on the island, but in doing so they also value livelihood sustainability and conservation activities, such as coral transplantation, artificial reefs, safety measures for fishers, beach cleanups, and sewage treatment. One project in particular, a kayak cooperative in Salak Khok, known as the Chang Spirit Club, was established and equipped with kayaking gear by DASTA to support alterative local-based employment opportunities for fishers. From its first establishment in 2005, the co-op had a membership of approximately 30 households; today all households hold memberships in Salak Khok (Personal Communication, Head of Chang Spirit Club, 2014).

Thus, DASTA is an example of an institution that was developed within a specific context and has had many successful and self-sustaining projects as a result. They worked with villages on the island and have demonstrated greater conservation and sustainable tourism outcomes than MKCNP. The park's lack of meaningful engagement likely limits potential for cooperation and collaboration with stakeholders and does little to encourage synergy among stakeholder groups. This, in turn, aligns with a prevailing criticism of MPAs having limited consideration for local communities in conservation, as MKCNP exhibits little effort to harness the potential of fishers and tour operators on the island for conservation goals. According to preliminary interviews with DASTA and MKCNP key informants, there is little interaction between DASTA and the park and they do not engage in projects with one another, despite both attending the meetings of the protected

area committee. MKCNP, for instance is constrained in their degree of flexibility, as they must follow the rules under the National Park Act. DASTA, on the other hand, has greater allowance for creativity and project development as well as the resources to do so. Another source of difference between the two is that DASTA considers the park to be too strict—to even constrain conservation-oriented projects, while MKCNP considers some of DASTA proposed ideas to be against the National Park Act.

Ultimately, to build upon strengths among stakeholders, it is suggested here that greater coordination and collaboration between MKCNP and DASTA could enhance or foster synergy. In the future, a greater recognition of community capacity by the park could also help to reduce the possibility for synergy potential to be lost when DASTA concludes its term on the island. DASTA's projects were designed to be sustainable through community engagement, training, and community ownership in terms of ongoing funding, past the initial start-up phase. However, Koh Chang benefited from having an institution that worked with locals to address concerns of sustainability and conservation. Thus, the demands and challenges facing villages are always changing, and the need for a responsive institution like DASTA is likely to continue. Institutions, in turn, must be flexible and able to adjust in order to address the dynamism required of ICM processes (Christie, 2005). Arrangements and strategies to enable greater integration of MPAs are also paramount to ICM (Cicin-Sain & Belfiore, 2005; Bennett & Dearden, 2012). MKCNP may not have the resources and legal flexibility to take on a similar role to DASTA's, but there is potential for greater involvement of stakeholders and to build upon their local capacity to encourage synergy for stewardship behaviour.

6.4 Study limitations

6.4.1 Language and cultural barrier

As a foreigner to Thailand, there were challenges in designing a study that would enable me to work with the language barrier while minimizing misinterpretations as much as possible. Additionally, cultural differences made simple observations of communication and interaction difficult to gain insight into the quality or nature of relationships among stakeholders. Thus, a survey using a questionnaire, administered by Thai enumerators was deemed the most appropriate approach. This method helped to reduce subjectivity that would have likely occurred if employing a method based solely on observations and interviews.

Field observations made on the island erred on the side of caution so as to not make judgments or generalizations and, when possible, were checked with locals with the assistance of a translator; however, there is a possibility that misinterpretations and mistranslations may have occurred. Further, when a translator was unavailable, conversations with businesses, tour operators, and tourists were held in English—and they were often not local, either from other parts of Thailand or from Europe. Their perspectives of the island and the coastal activities and environmental threats stem likely from different constructs than those who have had a longer history on the island. For example, their viewpoint would likely differ from those who have observed the changes Koh Chang has undergone over the last fifteen years of expansion of the tourism industry, together with shifting gears in the fisheries. Thus, there is potential that their perspectives could have influenced the local context I observed on the island.

6. 5 Methodological considerations

6.5.1 Instrument

This study offers an introduction to researching the concept of synergy among coastal stakeholders. Informed by the interactive governance framework, a methodological approach was designed to study systems that are, more or less, conducive to synergy formation. This posed a challenging task of developing an instrument that not only captured this concept, but was also fitting for the context as mentioned above. The use of a questionnaire enabled questions to be asked in the same manner to each respondent and closed-ended questions minimized the misinterpretations based on issues in translations. Questionnaires can attain a high degree of reliability (Babbie & Mouton, 2001), which, in this case, enabled comparisons across respondent groups. However, some question formats proved to be more informative than others. For instance, questions based on the scale 'no/none,' 'low/somewhat,' 'moderate,' 'very/high,' and 'don't know/no opinion' had less variation between activities and respondent groups than questions where respondents provided their own examples. The questions pertaining to relationships among activities, in particular, were more revealing. Here, respondents actively paired the activities under relationship types. During the pre-test, this section was the most time consuming for administrators to explain and respondents to complete. However, after revisions of reducing the number of activities and reordering the questions, speed of completion was eased. Capturing the complexity of a system is a difficult task as some form of simplification is inevitable under any method. However, the questions put forth in the questionnaire were designed to offer some insight as to whether there is potential for synergy. The fruition of synergy, however, was beyond the scope of

this study, although the system properties within governability framework and attention to key governing actors provided a basis for exploring how synergy may come to be in a place.

6.5.2 Seasonal variation

Since participation in coastal activities on Koh Chang varies seasonally, conducting fieldwork during only the rainy season may produce different outcomes in terms of field observations, interviews, and completion rate of the questionnaire.

Preliminary interviews and respondent rates were likely easier to conduct during the rainy season as respondents were more available than they would have been during the dry season. Fisheries operate all year long, with seasonal variations in the target species and gear types used. However, the southwest monsoon brings strong winds, heavy rains, and rough waters. Coastal tours as well as fishing activities are postponed during poor weather conditions. Often, the rain is of such intensity that travel by road around the island is unsafe. Conducting fieldwork during the rainy season, in many instances, meant fishers and tour operators often had more time to meet and talk. Similarly, during administration of the questionnaire the respondent rate was high and respondents took their time answering the questions. No respondent partially completed the questionnaire. Administration of the questionnaire would likely be more challenging to interest participants and expensive during the high season.

6.5.3 East vs. west coast

The east and west coast have different levels of involvement in tourism and fisheries activities. The east coast is comprised of traditional fishing and farming-based villages. Tourism activities are generally considered secondary or supplementary to predominant occupations in fisheries and agriculture. Tourism here is typically small-scale, local tourism ventures, such homestays, bungalows and guesthouses, kayaking, boat tours, and seafood restaurants. Tourists that visit the east coast are mostly Thai. The language barrier is greater on the east coast for foreign tourists. Further, tour and transportation agencies operate on the west coast making access to the east coast more difficult for tourists arriving on the island. In comparison, the west coast has two traditional fishing villages: Klong Son and Bang Bao where the majority of the respondents were surveyed. On this side, tourism plays a greater role in the local economies and offers a greater level of employment. The tourism industry is much more diverse and comprises a range of scales as well as tourist nationalities (Table 5.1).

Based on these differences, I had expected greater variation among respondents from the east and west coasts. However, there was a high level of similarity in questionnaire responses. A possible explanation for this is the respondents that were targeted: located in a fishing village with tourism activity. The reason, as mentioned in the methods chapter, was this would increase the level of familiarity respondents have with coastal activities and thus, greater opportunity to explore synergies if there is a greater likelihood of existing relationships between stakeholders. In doing so, there is the possibility that even with the differences of coasts, there is still a high level of similarity

among respondent groups. In other words, respondents that participated in the questionnaire from both the east and the west coasts may have had more in common than was discerned. For instance, on the west coast, the tourism activities located in or nearby Klong Son and Bang Bao were still smaller activities and the respondents surveyed worked for companies, i.e. as a captain or guide, but did not necessarily own them. The larger resorts are typically located nearby, but still on the periphery of the villages. Tourism in Klong Son consists of more expensive, long-term vacation rentals, the island's only golf course, a small marina, a gated resort and spa built nearby the fishers' boardwalks, boats, and stilt houses. Even in Bang Bao—the island's main tourist hub for coastal activities, larger scale accommodation is located outside the village.

Also, the island is relatively small (209km^2) and thus, the east and west coasts are not very far apart, despite some barriers to connectivity (i.e. the disconnected road in the south of the island and the island's mountainous centre). Although Koh Chang is somewhat isolated as an island, it is still connected to the mainland via ferry. Thus, interactions between the east and west coast and even mainland occur on a regular basis, which may also account for similarity in responses.

In summary, for the purposes of this study, along with time and resource constraints, the scope of this survey was appropriate for the study's aim and research objectives. This research is preliminary in nature by looking at 'potential' for synergy, and offers one approach to studying the concept of synergy among coastal stakeholders. Chapter seven concludes with the main findings and arguments put forth in this thesis as

well as suggestions for future research that builds upon this study and addresses some possible theoretical limitations.

Chapter Seven

Conclusion

This chapter concludes the thesis with a summary of the key findings according to the overarching research questions. Broader implications this study has for governance research of multiple-use areas are then drawn. Finally, to build upon this study, suggestions for future research are made in regards to study area, instrument, and theoretical considerations.

7.1 Summary of key findings

Informed by the orders of governance, the following sections will review the main findings for each research question.

7.1.1 What is the nature of relationships among activity groups?

The frequency of compatible and supportive relationships outweighed those characterized as incompatible and conflicting. Positive relationships were also more complex in connecting across a greater diversity of activities. This suggests that there is potential for synergy among activity groups based on relationships. Based on these findings, a system with a high level of complexity may not necessarily denote a less governable system. On the contrary, systems with a greater likelihood of synergy formation may increase governability and stewardship behaviour. Tourism activities, in particular, had the greatest occurrence of positive relationships within the tourism activity group. Bungalows and guesthouses were found to play a key role for synergy formation as they were the most common activities to be paired in positive relationships overall;

both exhibited a high number of connections with fisheries and conservation activity groups as well.

The fisheries activity group had the highest occurrence of negative relationships. However, conflicting relationships were concentrated among one fisheries activity in particular: push nets. Push nets had the greatest frequency of negative relationships among other fisheries activities followed by conservation activities.

7.1.2 How do activity groups judge each other in terms of their positive and negative impact?

Tourism, fisheries, and conservation respondents indicated high levels of positive impact to the local economy, community, and ecology across activity groups. Positive impacts were substantially higher than the negative impacts attributed to activities, with the exception of push net fisheries. Across groups, activities were perceived as being important to the island, which is conducive to creating synergy across groups.

7.1.3 How appropriate is the current governing system?

Within the social system-to-be-governed, activities are aggregated by tourism, fisheries, and conservation groups, which have a governing role. Here, the level of influence activities have in resource management was assessed based on respondents' perceptions. Besides push net fisheries, respondents indicated a high and relatively even level of influence across activities. Among the majority of respondents, the current level of influence was considered appropriate. For those who disagreed and provided a level of influence they consider more appropriate, the trend was to suggest activities have a

greater level of influence. This included push net fisheries, which had the lowest level of influence. Thus, the perceived governing role activities play is inclusive in nature with a high level of participation across groups.

7.1.4 What are the motivations and awareness for/of environmental stewardship?

Motivations for governance based on environmental values were high across groups with values of biodiversity, sufficiency economy, and moral responsibility rated the highest overall. Stewardship is considered a normative principle, invoking what one *ought* to do, which aligns with moral responsibility. The importance of biodiversity also represents another driver for stewardship, stemming from care for nature based on its intrinsic value. Sufficiency economy, a Thai principle of taking only what is necessary to meet one's needs, demonstrates care for others and for sustainable use. Instead of maximizing individual profit, shared benefits are valued which also supports stewardship behaviour.

Respondents provided examples of stewardship behaviour for tourism, fisheries, and conservation activities, which spoke to the groups' awareness of pro-environmental activities. Although tourism and fisheries respondents were more aware of stewardship activities within their own group, they provided similar examples. The following categories were organized to describe examples of caring and responsible behaviour among coastal activities: ecological recovery efforts, waste management, sustainable tourism practices, sustainable fisheries practices, as well as community engagement and

collaboration. Similarity among examples and a high level of awareness suggests potential for synergy among activity groups.

Additionally, potential for synergy was assessed by examining the similarity between respondents' responses. A higher level of association was interpreted as having a greater potential for synergy among respondent groups. In general, negative impacts and conflicting relationships as well as questions pertaining to the environment had a higher level of association among all respondent groups. In terms of implications of synergies for governance and stewardship, perceived social threats and environmental concern indicate a common ground of understanding. Mutual understanding is more conducive to stakeholders engaging in collaborative efforts.

7.2 Summary of research implications

Supportive and compatible relationships can provide an important source of local capacity in addressing wicked socio-ecological problems. Here, an emphasis on relationships among prominent stakeholder groups was made to assess their potential for synergy. Motivation for exploring synergy potential is based on the premise that stakeholders working together can achieve greater outcomes than if they are constrained within their respective activity groups.

The theoretical framework and method used here provided an introduction to studying synergy. Informed by the interactive governance framework, this study demonstrates that social systems are inherently complex and are comprised of many

different types of relationships; however, the quality of these relationships cannot be assumed without careful consideration of the local context.

There is a tendency within conservation discourse to emphasize the problems coastal areas face, including competition and conflict among stakeholders as well as environmental degradation laced with broader concerns of climate change and resource sustainability. This is reflected in the management arrangements sought to curtail adverse human impacts, which often restrict stakeholders' interactions with one another and the environment. Although interventions, such as MPAs or multiple-use zoning, have their merits and their contributions should not be disregarded, it is also important to reassess their utility on a case-by-case basis. For example, this study highlights the complexity of positive relationships among stakeholders, which could in turn offer sources of opportunity to address problems. Prevailing management strategies, such as MPAs, often do not build upon the strengths these relationships may harbour and thus, their potential remains unrealized. Adversely, standardized management strategies may even create new sources of conflict and tension by disproportionately favouring different activities over others.

Fostering supportive and compatible relationships can, in turn, cultivate greater collective tendencies for stewardship of environmental resources as the principle of responsibility to care for nature is founded in altruistic and environmental values. Greater collaboration among coastal stakeholders can have important implications for supporting stewardship behaviour. The capacity of stakeholders to act as stewards should not be

undervalued. Small-scale fishers, for instance, are not necessarily a threat to conservation. As demonstrated in this study, they can play an important role in participating in conservation efforts and being compatible with conservation activities. Further, small-scale fishers represent a group whose livelihood and food security depends on healthy, functioning coastal ecosystems and, in many cases, whose connection to the coastal area and fishing tradition also has deep cultural heritage ties. Inclusion among coastal stakeholders can draw from diverse knowledge and skill sets, such as those held by small-scale fishers, to enhance protection and responsible use of coastal resources.

In summary, highlighting positive relationships in addition to the conflicts can provide important insight into the capacities of a social system. In many cases, positive or neutral relationships in a community are more ubiquitous than those characterized by conflicts, as they are commonly represented in ties among co-workers, neighbors, friends, and families. Thus, greater consideration for synergies can provide an important source for opportunity creation in dealing with wicked problems inherent to coastal governance. Further, in order to improve the efficacy of ICM, the mutual benefits of activities must have proper consideration, equal to that of the incompatibilities.

7.3 Future research

This study offered a way to look at potential for synergy by investigating the quality of existing relationships and the perceptions stakeholders have of the different activities in terms of their impacts and influence as a starting point. In order to build upon this, greater exploration is required regarding the quality of relationships between

stakeholders. For instance, a question pertaining to what makes these relationships positive?

One of the emphasized outcomes of this study encourages a different dialogue about multiple-use coastal areas in that different activity groups cannot be assumed to be in conflict with one another or to have a predominantly adverse impact on the local socio-economic and ecological systems. Additionally, groups often seen as a threat to the environment, due to their engagement in extractive activities (i.e. small-scale fishers), can exhibit stewardship behaviour. In some cases, the environment may be more protected than if they were to stop their activities altogether. Further research could be conducted to provide greater insight, based on empirical study, of how institutions can actually foster synergies and how context-appropriate management strategies can utilize the strength of stakeholders based on supportive relationships. Within the context of Koh Chang, greater consideration could be extended for the role NGOs may play in fostering synergy. There was not enough information gathered during the fieldwork period to speak to NGOs' activity on the island; however, there were indications of the strong role local actors have had in coordinating among coastal stakeholders.

Another consideration for additional research is the role of tourists on the island. Tourists in particular pose a threat to environmental stewardship for the island for several reasons. First, tourists are transient; they typically visit for short periods of time and thus do not have a similar basis of connection to the island as long-term residents. Second, tourists are less aware of the specific environmental challenges a tourist destination faces.

Although they may not actively or knowingly engage in harmful behaviour, certain habits, such as purchasing bottled water or having long showers, can strain or exceed the capacity of local infrastructure. Similarly, unfamiliar ecosystems and activities, such as corals and snorkeling can lead to degradation from trampling and touching. Awareness and education can help to engage tourists, but it can be difficult to instill a sense of care or enforce rules. For Koh Chang in particular, one issue with awareness campaigns has been the language barrier. Tourists come from such a range of countries that one language, such as English, cannot be presumed to be an effective language of communication to have far-reaching understanding across tourist nationalities. Thus, additional research could include stewardship potential among visitors and determining what impact the high volume of tourists may have on the synergies and stewardship behaviour of those included in this study: tourism, fisheries, and conservation. In other multiple-use areas, where different coastal activities operate, the study scope could be expanded to capture different complexities and dynamics, such as those associated with oil and gas exploration.

This study focused on potential for synergy at the community-level among tourism, fisheries, and conservation stakeholders. From here, based on care for synergy among supportive relationships and institutions, extensions were made to enhancing collective stewardship behaviour. At the local level, there is support for stewardship, such as potential for hands-on, daily care among those who interact closely with the coastal environment and depend upon it for food and/or their livelihoods. However, additional research could build upon the concept of synergy at different scales with consideration to

regional, national, and global settings because they all have influence over ICM and may affect what capacity for stewardship is available.

This research made inferences as to situations that may be more conducive to stewardship, through an emphasis on capacity building through relationships. However, further research into the concept of stewardship might shed more insight into how it can be achieved in practice as well as its contributions towards ICM. Stewardship is based on the three-tiered relational model with the 'appointer' or 'owner' at the top, the 'steward' in the middle, and 'property' as the base (Roach, 2000). Contemporary secular usage of stewardship often upholds the concept of future generations, or those similar to Robin Attfield's "transgenerational community," as the higher entity to whom stewards are ultimately responsible. However, there are other considerations pertaining to the concept of 'owner' that may also influence how stewardship is carried out in a place. For instance, what role does the market and state play for stewardship? While, cultivating stewardship at the local level is important, additional insight may be gained as to how local level stewardship manifests with greater attention to the stewardship's top-tier. For instance, in the context of Koh Chang, the surrounding coastal area as well as approximately 85% of the island belongs to the state: how might this influence stewardship? Additionally, large-scale tourism is predominately owned by wealthy, non-local or foreign owned businesses. Does their presence on the island have influence over stewardship? Greater research based on the concept of stewardship could help to explore some power dynamics in the area.

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Personal Communications

Personal Communication. 2014. Employee, DASTA.

Personal Communication. 2014. Employee, MKCNP.

Personal Communication. 2014. Head of Chang Spirit Club.

Personal Communication. 2014. Village Head.

Appendix A: Questionnaire Survey, English

Faculty of Arts/Department of Geography

Hello,

I am a graduate student from Memorial University of Newfoundland in St. John's, Canada. I am conducting a study as part of a project entitled "Too Big To Ignore: Global Partnership for Small-Scale Fisheries Research."

I would like to invite you to partake in my survey regarding different operations in the coastal areas of Koh Chang. The purpose of this study is to gain an understanding of the relationships among different operations within multiple-use coastal areas. There are no right or wrong answers to any of the following questions as this survey simply seeks your opinions. Your participation is voluntary and all of the answers you provide will be treated with **strict confidentiality** and **anonymity.** The information collected here will only be used for the purposes of our research. We would appreciate that you answer all questions, but you are free to withdraw at anytime. The survey should take approximately 20-25 minutes to complete.

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as the way you have been treated or your rights as a participant, you may contact the Chairperson of the ICEHR at **icehr@mun.ca** or by telephone at +1-709-864-2861.

If you have comments or questions, or wish to receive a copy of the final report, please contact myself or my supervisor, Dr. Ratana Chuenpagdee.

Thank you.
Sincerely,

Victoria Rogers
MA Student
Phone #: 0926571276
Email: vlf813@mun.ca

Dr. Ratana Chuenpagdee
Professor
International Coastal Network
Phone #: +1 709 864-3157
Email: ratanac@mun.ca

N°:____
Location: _____
Date ____/____/____
Enumerator:_____
Gender: □ Male □ Female □ Other
Start time:_____
End time:_____

[Screening and Stakeholder Identification Question]

1) Which of the following operation categories best describes your interaction with the coastal area? (Check ONE only).
□ Tourism □ Fisheries □ Conservation □None of the above, thank you

[Section 1]

2) What is your main occupation?
_____

3) How long have you been in this occupation?
# of years____ (If less than 1 year, # of months___)

4) In addition to your main occupation, what else do you do for a living?

_____

5) Under the following three categories, indicate which operations you participate in (Check all that apply):

Tourism	Fisheries	Conservation
□ Tour operations	□ Small-scale fisheries	□ Community-based operations
□ Accommodation (hotels, guest houses, homestays)	□ Medium-scale fisheries	□ Non-governmental organization operations (local, national, international)
□ Food services	□ Large-scale fisheries	□ Mu Koh Chang Marine National Park operations
□ Others (E.g. souvenir shops, scooter rental)	□ Others (E.g. processing, aquaculture)	□ Others (E.g. university-led operations, other governmental operations)
Provide more details on the option(s) selected:	Provide more details on the option(s) selected:	Provide more details on the option(s) selected:

6) Are you from Koh Chang?

□ Yes □ No

If yes, please specify which village:_____

If no, where are you from? _____ How long have you lived here? _____

7) What is your age?

□ 25 or under □ 26 - 35 □ 36 - 45

□ 46 - 55 □ 56 - 65 □ 66 or over

8) What is the highest level of education you have completed to this date?

□ None □ Grade 4 □ Middle school

□ High school □ Bachelor's degree □ Master's degree

□ Doctoral degree □ Other, please specify:_____

[Section 2]

9) In your opinion, indicate the level of importance of the following aspects for environmental governance.

Use number 0, 1, 2, 3 to represent the 'level' of your responses.
'**0**' = no/none, '**1**' = low/somewhat, '**2**' = moderate, '**3**' = very/high. Use '**9**' for don't know or no opinion.

Aspects for environmental governance	Level of importance
Moral responsibility	
Food security	
Livelihood sustainability	
Sufficiency economy	
Intergenerational equity	
Education	
Spiritual and religious belief	
Natural beauty	
Habitat integrity	
Biodiversity	
Others, please specify:	

10) Please list any examples of caring and responsible environmental behaviour by tourism, fisheries, and conservation operations:

i. Tourism	
ii. Fisheries	
iii. Conservation	

11) How familiar are you with the following operations on Koh Chang?

Use number 0, 1, 2, 3 to represent the 'level' of your responses.
'**0**' = no/none, '**1**' = low/somewhat, '**2**' = moderate, '**3**' = very/high. Use '**9**' for don't know or no opinion.

Operations	Level of familiarity
Guesthouses and bungalows	
Kayaking	
Snorkeling	
Shrimp gillnet fisheries	
Squid trap fisheries	
Push net fisheries	
Coastal rehabilitation (e.g. mangrove reforestation, beach cleanup of DASTA and Au-Bor-Tor)	
Fisheries enhancement (e.g. artificial reefs, crab banks of DoF)	
Mu Koh Chang National Park	

[Section 3]

In the following questions, please indicate the level of importance and negative impact the listed operations have to Koh Chang in terms of economy, community and ecology.

Use number 0, 1, 2, 3 to represent the 'level' of your responses.
'**0**' = no/none, '**1**' = low/somewhat, '**2**' = moderate, '**3**' = very/high. Use '**9**' for don't know or no opinion.

Operations	12) **Economic**		13) **Community**		14) **Ecological**	
	Importance	Negative impact	Importance	Negative impact	Importance	Negative impact
Guesthouses and bungalows						
Kayaking						
Snorkeling						
Shrimp gillnet fisheries						
Squid trap fisheries						
Push net fisheries						
Coastal rehabilitation (e.g. mangrove restoration, beach cleanup of DASTA and Au-Bor-Tor)						
Fisheries enhancement (e.g. artificial reefs, crab banks of DoF)						
Mu Koh Chang National Park						

[Section 4]
Please answer the following questions regarding the level of influence of coastal operations in the management of coastal resources

Use number 0, 1, 2, 3 to represent the 'level' of your responses.
'**0**' = no/none, '**1**' = low/somewhat, '**2**' = moderate, '**3**' = very/high. Use '**9**' for don't know or no opinion.

Operations	15 (a). Indicate the level of influence each operation has in the management of coastal resources	15 (b). Do you consider this level of influence to be appropriate? (Yes/ No/ No Opinion)	15 (c). If no, please indicate the level of influence you consider appropriate
Guesthouses and bungalows			
Kayaking			
Snorkeling			
Shrimp gillnet fisheries			
Squid trap fisheries			
Push net fisheries			
Coastal rehabilitation (e.g. mangrove restoration, beach cleanup of DASTA and Au-Bor-Tor)			
Fisheries enhancement (e.g. artificial reefs, crab banks of DoF)			
Mu Koh Chang National Park			

[Section 5]

In this section, please refer to the list of numbered operations on the sheet provided to answer the following questions. Use the operation number to indicate your response in the tables.

Any of the operations can be paired together and an operation can be reused as many times as you would like.

16) What pairs of operations do you consider to be **compatible** or **supportive** of each other?

Operation number	Operation number

17) What pairs of operations do you consider to be **incompatible** or **in conflict** with each other?

Operation number	Operation number

18) What pairs of operations do you consider to have **a neutral relationship** with each other?

Operation number	Operation number

19) What pairs of operations do you think would benefit from GREATER **collaboration** with each other to enhance caring and responsible environmental behavior?

Operation number	Operation number

For any additional comments, please write in the space below:

Thank you for your participation.

Appendix A: Prop sheet, English

1. Guesthouses and bungalows
2. Kayaking
3. Snorkeling
4. Shrimp gillnet fisheries
5. Squid trap fisheries
6. Push net fisheries
7. Coastal rehabilitation (E.g. mangrove restoration, beach cleanup of DASTA and Au-Bor-Tor)
8. Fisheries enhancement (E.g. Artificial reefs, crab banks of DoF)
9. Mu Koh Chang National Park

Appendix B: Questionnaire Survey, Thai

คณะอักษรศาสตร์/ภาควิชาภูมิศาสตร์

สวัสดีค่ะ

ดิฉันเป็นนักศึกษาปริญาญาโทจากมหาวิทยาลัยเมโมเรียล (Memorial University) แห่งนิวฟาวด์แลนด์ ในเซนต์จอห์น ประเทศแคนาดา ดิฉันกำลังทำการศึกษาภายใต้โครงการ "ใหญ่เกินกว่าจะเพิกเฉย การวิจัยพันธมิตรระดับโลกเพื่อการประมงขนาดเล็ก"

ดิฉันขอความร่วมมือท่านให้ข้อคิดเห็นตามแบบสำรวจ
ซึ่งเกี่ยวข้องกับกิจกรรมบริเวณพื้นที่ชายฝั่งทะเลของเกาะช้าง วัตถุประสงค์ของการศึกษานี้คือ
เพื่อทำความเข้าใจถึงปฏิสัมพันธ์และความสัมพันธ์ของกิจกรรมต่างๆในพื้นที่ชายฝั่ง
การตอบคำถามจะไม่มีคำตอบที่ถูกหรือผิด ความคิดเห็นและความร่วมมือของคุณจึงมีค่าอย่างยิ่ง
และคำตอบที่คุณให้มาทั้งหมดจะเก็บเป็นความลับและไม่มีการเปิดเผยชื่อ□
ข้อมูลที่ได้นี้จะใช้เพื่อวัตถุประสงค์ในการสำรวจของเราเท่านั้น เราขอขอบคุณที่คุณจะตอบทุกคำถาม
ทั้งนี้คุณสามารถที่จะถอนตัวได้ทุกเมื่อ□ารสำรวจนี้จะใช้เวลาประมาณ 15-20 นาที

ข้อเสนอของการวิจัยนี้ได้รับการตรวจสอบโดยคณะกรรมการสหวิชาการด้านจริยธรรมเพื่อการทำวิจัยในมนุษย์ ซึ่งสอดคล้องตามนโยบายด้านจริยธรรมของมหาวิทยาลัยเมโมเรียล
หากคุณมีความกังวลเกี่ยวกับจริยธรรมการวิจัย
เช่นวิธีการที่คุณได้รับการปฏิบัติหรือสิทธิส่วนบุคคลในฐานะเป็นผู้มีส่วนร่วม คุณอาจติดต่อประธานของ ICEHR ที่ **icehr@mun.ca** หรือทางโทรศัพท์ที่ +1-709-864-2861

ถ้าคุณมีความคิดเห็นหรือคำถามใด หรือต้องการสำเนารายงานขั้นสุดท้าย
กรุณาติดต่อโดยตรงที่ดิฉันหรืออาจารย์ที่ปรึกษา ศาสตาจารย์ ดร. รัตนา ชื่นภักดี

ขอขอบพระคุณ
ด้วยความนับถือ

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ดร.รัตนา ชื่นภักดี
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อีเมล: ratanac@mun.ca

N°:____
สถานที่: _____
วันที่ ___/___/____
ผู้สัมภาษณ์:_____
เพศ: ชาย หญิง อื่นๆ
เริ่มเวลา:_____สิ้นสุดเวลา:_____

[การคัดกรองและคำถามสำหรับผู้มีส่วนได้ส่วนเสีย]
1) การดำเนินการใดต่อไปนี้เกี่ยวข้องกับคุณมากที่สุด (เลือกเพียงหนึ่งข้อเท่านั้น)
□การท่องเที่ยว □การประมง □การอนุรักษ์ธรรมชาติ □ไม่ได้เกี่ยวข้องใด ๆ

[ส่วนที่ 1]
2) อาชีพหลักของคุณคืออะไร
□□□□
_____

3) คุณประกอบอาชีพนี้นานแค่ไหน
□□□ # จำนวนปี □□ (ถ้าน้อยกว่า 1 ปี # จำนวนเดือน___)

4) นอกจากอาชีพหลักแล้ว คุณยังประกอบอาชีพอื่นใดอีก (โปรดระบุ)

_____

5) ท่านมีส่วนร่วมในการดำเนินการต่อไปนี้หรือไม่ (ตอบได้มากกว่าหนึ่งข้อ):

การท่องเที่ยว	การประมง	การอนุรักษ์ธรรมชาติ
ธุรกิจนำเที่ยว (ตกปลา ดำน้ำ)	การประมงขนาดเล็ก	กิจกรรมที่ดำเนินการโดยชุมชน
ที่พัก (โรงแรม บ้านพักรับรอง โฮมสเตย์)	การประมงขนาดกลาง	กิจกรรมขององค์กรพัฒนาเอกชน (ระดับท้องถิ่น, ระดับชาติ, นานาชาติ)
บริการด้านอาหาร	การประมงขนาดใหญ่	กิจกรรมของอุทยานแห่งชาติหมู่เกาะช้าง
อื่นๆ (เช่น ขายของที่ระลึก รถเช่า)	อื่น ๆ (เช่น การเพาะเลี้ยง การแปรรูปอาหาร)	อื่น ๆ (กิจกรรมของมหาวิทยาลัย องค์กรอื่นๆที่เกี่ยวข้อง)
โปรดให้ข้อมูลเพิ่มเติมในข้อที่ท่านเลือก:	โปรดให้ข้อมูลเพิ่มเติมในข้อที่ท่านเลือก เช่น ระบุขนาดเรือ ประเภทเครื่องมือประมงที่ใช้ และชนิดของสัตว์น้ำที่จับได้ กรณีที่คำตอบของท่านเกียวข้องกับการประมง	โปรดให้ข้อมูลเพิ่มเติมในข้อที่ท่านเลือก:

6) คุณเป็นคนเกาะช้างใช่หรือไม่

□ใช่ □ไม่ใช่

ถ้าใช่ กรุณาระบุว่าอยู่หมู่บ้านไหน:_____

ถ้าไม่ใช่ คุณมาจากที่ไหน _____ คุณอาศัยอยู่ที่นี่นานแค่ไหนแล้ว _____

□□□□□

□□□□

7) คุณอายุเท่าไร

□25 หรือต่ำกว่า □26 – 35 □36 – 45

□46 – 55 □56 – 65 □66 หรือมากกว่า

8) ระดับการศึกษาสูงสุด

□ไม่ได้รับการศึกษา □□□□□□□□ □มัธยมต้น □มัธยมปลาย

□ปริญญาตรี □ปริญญาโท □ปริญญาเอก

□อื่นๆ โปรดระบุ :_____

[ส่วนที่2]

9) กรุณาระบุระดับความสำคัญของประเด็นใดต่อไปนี้ในการบริหารจัดการเพื่อความสมบูรณ์ของสิ่งแวดล้อมชายฝั่ง

ตัวเลข 0, 1, 2, 3 แทน 'ระดับความสำคัญ'
'0' = ไม่/ไม่มี, '1' = ต่ำ/มีบ้าง, '2' = ปานกลาง, '3' = มาก/สูง ใช้เลข'9' กรณีที่ไม่ทราบหรือไม่มีความเห็น

ประเด็น	ระดับความสำคัญ
ความรับผิดชอบและจิตสำนึก□	
ความมั่นคงด้านอาหาร	
ความพอเพียงทางเศรษฐกิจ	
ความยั่งยืนของวิถีชีวิต	
ความเผื่อแผ่ถึงรุ่นลูกรุ่นหลาน	
การศึกษา	
ความเชื่อเรื่องสิ่งศักดิ์สิทธิ์/ศาสนา	
ความงดงามของธรรมชาติ	
ความสมบูรณ์ของถิ่นที่อยู่ของสัตว์ทะเล	
ความหลากหลายทางชีวภาพ	
อื่นๆ โปรดระบุ:	

10) กรุณาระบุถึงพฤติกรรมที่แสดงถึงหรือเกี่ยวข้องกับ การเอาใจใส่และความรับผิดชอบต่อสิ่งแวดล้อม ในประเด็นต่อไปนี้

การท่องเที่ยว	
การประมง	
การอนุรักษ์	

11) คุณมีความคุ้นเคยเกี่ยวกับการดำเนินการต่อไปนี้อย่างไร
ตัวเลข 0, 1, 2, 3 แทน 'ระดับความคุ้นเคย'
'0' = ไม่/ไม่มี, '1' = ต่ำ/มีบ้าง, '2' = ปานกลาง, '3' = มาก/สูง ใช้เลข'9' กรณีที่ไม่ทราบหรือไม่มีความเห็น

การดำเนินการ	ระดับความคุ้นเคย
การมีบังกาโล เกสท์เฮาส์ ในพื้นที่	
การพายเรือคายัก	
การดำน้ำผิวน้ำ	
การประมงอวนกุ้ง	
การประมงลอบหมึก	
การประมงอวนรุน	
การทำกิจกรรมฟื้นฟูชายหาด (การเก็บขยะ การทำความสะอาดชายหาด การปลูกป่าชายเลน)	
การทำกิจกรรมฟื้นฟูสัตว์น้ำ (การวางปะการังเทียม ธนาคารปู)	
อุทยานแห่งชาติหมู่เกาะช้าง	

[ส่วนที่ 3]
โปรดระบุความสำคัญ และผลกระทบทางลบของการดำเนินการต่อไปนี้ ต่อสภาพเศรษฐกิจ ชุมชน และระบบนิเวศ

ตัวเลข 0, 1, 2, 3 แทน 'ระดับความสำคัญ'
'0' = ไม่/ไม่มี, '1' = ต่ำ/มีบ้าง, '2' = ปานกลาง, '3' = มาก/สูง ใช้เลข'9' กรณีที่ไม่ทราบหรือไม่มีความเห็น

การดำเนินการ	12) ความสำคัญ ต่อสภาพเศรษฐกิจ		13) ความสำคัญ ต่อสภาพชุมชน		14) ความสำคัญ ต่อระบบนิเวศ	
	ความสำคัญ	ผลกระทบทางลบ	ความสำคัญ	ผลกระทบทางลบ	ความสำคัญ	ผลกระทบทางลบ
การมีบังกาโลเกสท์เฮาส์ ในพื้นที่						
การพายเรือคายัก						
การดำน้ำผิวน้ำ						
การประมงอวนกุ้ง						
การประมงลอบหมึก						
การประมงอวนรุน						
การทำกิจกรรมฟื้นฟูชายหาด (การเก็บขยะ การทำความสะอาดชายหาด การปลูกป่าชายเลน)						
การทำกิจกรรมฟื้นฟูสัตว์น้ำ (การวางปะการังเทียม ธนาคารปู)						
อุทยานแห่งชาติหมู่เกาะช้าง						

[ส่วนที่ 4]
โปรดระบุบทบาทของผู้ดำเนินการต่อไปนี้ต่อการบริหารจัดการทรัพยากรธรรมชาติ ตามระดับที่กำหนด

ใช้ตัวเลข 0, 1, 2, 3 แทน 'ระดับบทบาท'
'0' = ไม่/ไม่มี, '1' = ต่ำ/มีบ้าง, '2' = ปานกลาง, '3' = มาก/สูง ใช้เลข'9' ในกรณีที่ไม่ทราบหรือไม่มีความเห็น

การดำเนินการ	15.1) มีบทบาทต่อการบริหารจัดการทรัพยากรธรรมชาติระดับไหน	15.2) บทบาทระดับนี้เหมาะสมหรือไม่	15.3) หากไม่เหมาะสมระดับที่เหมาะสมควรเป็นอย่างไร
การมีบังกาโลเกสท์เฮาส์ ในพื้นที่			
การพายเรือคายัก			
การดำน้ำผิวน้ำ			
การประมงอวนกุ้ง			
การประมงลอบหมึก			
การประมงอวนรุน			
การทำกิจกรรมฟื้นฟูชายหาด (การเก็บขยะ การทำความสะอาดชายหาด การปลูกป่าชายเลน)			
การทำกิจกรรมฟื้นฟูสัตว์น้ำ (การวางปะการังเทียม ธนาคารปู)			
อุทยานแห่งชาติหมู่เกาะช้าง			

อพท : องค์การบริหารการพัฒนาพื้นที่พิเศษเพื่อการท่องเที่ยวอย่างยั่งยืน
อบต: องค์การบริหารส่วนตำบล

[ส่วนที่ 5]

คำถามต่อไปเกี่ยวข้องกับการดำเนินการ 9 รายการ กรุณาตอบคำถามเพื่อแสดงความสัมพันธ์ของการดำเนินการ ขอให้ตอบโดยการจับคู่ □

16) การดำเนินการใดที่มีผลและสนับสนุนซึ่งกันและกัน (ต่อชีวิตความเป็นอยู่ การอนุรักษ์)

เลขกิจกรรม	เลขกิจกรรม

17) การดำเนินการใด ไม่มีความเกี่ยวข้องกัน

เลขกิจกรรม	เลขกิจกรรม

18)☒ารดำเนินการใดที่เข้ากันไม่ได้ หรือขัดแย้งกัน

เลขกิจกรรม	เลขกิจกรรม

19) การดำเนินการใดหากร่วมมือกัน จะส่งเสริมให้มีผลต่อการเอาใจใส่และความรับผิดชอบต่อสิ่งแวดล้อมมากขึ้น

เลขกิจกรรม	เลขกิจกรรม

สำหรับความคิดเห็นเพิ่มเติมใด ๆ กรุณาเขียนในที่ว่างด้านล่างนี้:

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ขอขอบคุณในความร่วมมือ

Appendix B: Prop sheet, Thai

1. การมีบังกาโล□ทสท์เฮาส์□ในพื้นที่
2. การพายเรือคายัก
3. การดำน้ำผิวน้ำ
4. การประมงอวนกุ้ง
5. การประมงลอบหมึก
6. การประมงอวนรุน
7. การทำกิจกรรมฟื้นฟูชายหาด□(การเก็บขยะ□ การทำความสะอาดชายหาด□การปลูกป่าชายเลน ภายใต้หน่วยงาน อบต,□อพท หรืออื่นๆ)
8. การทำกิจกรรมฟื้นฟูสัตว์น้ำ□ (การวางปะการังเทียม□นาคารปู ภายใต้หน่วยงานกรมประมง)
9. อุทยานแห่งชาติหมู่เกาะช้าง