ARTISANAL FISHING PRACTICES IN ACEH, INDONESIA: THE EMBEDDED COMMONS

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A Thesis

Presented to the

Faculty of

San Diego State University

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In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Anthropology

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by

Barbara Suzanne Quimby

Summer 2012

SAN DIEGO STATE UNIVERSITY

The Undersigned Faculty Committee Approves the

Thesis of Barbara Suzanne Quimby:

Artisanal Fishing Practices in Aceh, Indonesia: The Embedded Commons

Matthew Lauer, Chair
Department of Anthropology

Erin Riley
Department of Anthropology

Arielle Levine
Department of Geography

May 11, 2012
Approval Date

ABSTRACT OF THE THESIS

Artisanal Fishing Practices in Aceh, Indonesia: The Embedded Commons
by
Barbara Suzanne Quimby
Master of Arts in Anthropology
San Diego State University, 2012

This case study examines the emergent practices of artisanal fishers in a coral reef commons, and the dynamic social processes in which those commons are embedded. Studies of the institutions and governance of shared natural resources, known as a commons, have yielded useful analytical approaches for resource management. However, individual actors and institutions are often decontextualized, inviting an ahistorical and potentially homogenous view of communities that undermines truly community-based management initiatives. Most critically, the actual use of the commons is not authentically reflected in institutions or tools of governance. With practice theory, this research focuses on one community's direct engagement with marine resources as a point of entry for exploring the commons as a coupled social and ecological environment. Using ethnographic methods over an eleven week study, this research addresses the practices that emerge in resource use and the dynamic social context in which the Haloban commons are embedded.

Located off the western coast of Sumatra in the islands of Pulau Banyak, the small community of Haloban has experienced two devastating tsunami events in 2004 and 2005 which have altered both the biophysical and social environments. Fishing is the predominant occupation for men, who use a variety of "traditional" gear types and small perahu boats to catch fish, octopus, lobster, and other sealife in the coral reefs and mangroves. There are very few explicit regulations or customary limitations on fishing. However, several situated practices were observed in use, including first-come privileges, self-spacing, and repetition avoidance that are unarticulated and emergent within shifting contexts. Development and tourism are also changing the use, and therefore meaning, of Haloban's marine commons. Taking a perspective of the commons as embedded in these ongoing social, political, and economic processes allows for the incorporation of diversity and complexity into analysis. Exploring those processes and the actual resource use and engagement of fishers with the marine environment may inform more nuanced, adaptable, and truly "local" community-based management.

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ACKNOWLEDGEMENTS

I am deeply grateful for the support I have received from my mentors, colleagues, friends and family in pursuit of my Masters. Matthew Lauer supported my aspirations for a project in environmental anthropology from very early on, and has driven me to be ambitious and thoughtful in my research and my writing. Erin Riley and Arielle Levine, my thesis committee members, have also given great advice and feedback throughout the development of this project. I wish to thank the exceptional faculty and students of the San Diego State University Department of Anthropology, particularly Fredrick Conway and Ramona Perez for providing encouragement and inspiration from my first year in the program. I am also grateful to my colleagues, especially Trudi Andres and Ben Nugent for their insights, edits, and friendship. I sincerely wish to thank the people of Haloban and Pulau Banyak Barat for their kindness and assistance. My fieldwork and experience in Indonesia was greatly enhanced by my friendship and partnership with Anhar, Uzhar, Akbar, Surni, and many others. Of course, I would never have discovered the opportunity for research and the beauty of Aceh without Maggie Muurmans, Mahmud Bangkaru, and Yayasan Pulau Banyak.

Baber Farhat, you've been my steadfast source of encouragement and strength and I am extremely grateful for all you do. I am equally fortunate to have parents and family who offered their unreserved support in every aspect of my graduate school adventure, from helping me move to San Diego, weather the challenges of graduate study, and pay for necessities like trips to Indonesia. This research was also generously supported by the San Diego Association of Environmental Professionals, ASM Affiliates, and the Graduate Division Travel Grant. My sincere thanks to all.

CHAPTER 1

INTRODUCTION

In the tropical islands of Pulau Banyak off the western coast of Sumatra, artisanal fishers venture into the reefs and mangroves surrounding their villages nearly every day. The men of one Muslim community use small boats and simple gear to dive for octopus, net bigeye trevally, or line-catch reef grouper in a space shared with only a few neighbors. Friday is reserved as a day of prayer and fishing prohibited, but men may shuttle groups of women by boat to the mangroves to glean for mud clams, or head out to the islands owned by their family for gardening and collecting coconuts. These regular encounters with the environment seem very traditional, but change is more prevalent than it might first appear, as fishers and gleaners constantly adapt to tsunamis, tourists, and other erratic phenomena. The process is ongoing, shaped and reshaped over time and with each engagement.

The activities of small-scale fishers like these have garnered attention in the global environmental discourse on common-pool resource use and sustainability. Common-pool resources such as coastal fisheries have experienced increasing overexploitation, inspiring Hardin's assertion that whenever a group of individuals are using a scarce common resource, "ruin is the destination towards which all men rush" (Hardin 1968:1244). In the early 1990s, Elinor Ostrom and others questioned the assumptions drawn from Hardin's Tragedy of the Commons, noting that the tragedy had somehow been avoided in many circumstances. Ostrom (1990) found that in those cases that "commons" were not open-access but instead a limited-access common-pool resource: self-regulated at the community level through social institutions. Ostrom and other common-property scholars hypothesized that centralized regulation was not the only, or even best, option for sustainability; perhaps community-initiated institutions already existed at the local level that could be more effective. At the very least, they may be a place to start when building environmental management programs.

Drawing on these principles, community-based management has flourished in the past decade, and become the standard framework for conservation and resource management practitioners (Salafsky et al. 2001), particularly in marine settings (Bunce et al. 2000;

International Union for Conservation of Nature [IUCN] 2008; Johannes 2002). Not only is this approach considered to be more practical for vast marine areas where control and enforcement are extreme challenges (Pollnac and Pomeroy 2005); it is also envisioned to draw from local indigenous knowledge and tenure systems, thereby empowering local people to be more active in decision-making and share responsibility for outcomes (Agrawal 2001; Armitage 2003; Berkes and Colding 2000; Ferse et al. 2010; Pomeroy and Berkes 1997). In Indonesia, a culturally heterogeneous nation with millions of coastal residents who depend on some of the world's most biologically diverse reefs, the community approach has connected well with a political shift towards decentralization (Burke et al. 2002). As conservationists, communities, and the state negotiate rights and responsibilities related to natural resources in this dynamic setting, customary adat institutions have become an important framework for legitimizing local tenure and resource control (Acciaioli 2001; McCarthy 2005), particularly the marine tenure institutions of sasi found in Eastern Indonesia (Dutton et al. 2009; McLeod et al. 2009; Zerner 1994).

However, not all community-based management initiatives have proven to be as "local" or sustainable as imagined, especially in Indonesia (Affif and Lowe 2007; Elliott et al. 2001; Mullins 2004), and critics have turned attention to weaknesses in the theoretical framework of common-pool resource management. Some have noted the emphasis on formalized social systems that fit Western preconceptions of what "indigenous", "traditional", or "local" really means (Li 2000; Tsing 2005; Pálsson 1998; West et al. 2006). Social institutions and groups are sometimes treated as unchanging and stable through time, and social diversity and mobility, history, and external influences are notably absent (Agrawal 2002; Fabinyi et al. 2010; Rao and Appadurai 2008; West 2005). New-institutional frameworks presented by some common-property scholars draw from economic epistemologies that isolate the autonomous individual as a unit of analysis, known as methodological individualism (Bardhan and Ray 2008; McCay 2002) . This potentially undervalues the relationships of those actors as members of groups and communities, and the greater social context.

Anthropologists have engaged in the debate by trying to refocus the conversation on the complex social processes that are the context for the commons, suggesting that "we are not well served by a paradigm that separates the individual user from the social, political, and

economic structures in which he/she is placed" (Peters 1987:193). Thus, some have employed the concept of "embeddedness" to reconnect these social entities and avoid the pitfalls of essentialism (McCay 2002). The idea of embeddedness was introduced by Polanyi (1944) to describe how economic markets are inseparable from the socio-cultural context in which they exist. In the commons discourse, economists have resisted the embedded view for its introduction of complexity (Bardhan and Ray 2008). Yet, at the local level in particular, it provides the framework for including the internal diversity, historical processes, and politics that are truly inextricable from issues of environmental use.

Some anthropologists have also reevaluated the focus on intellectualized institutions of resource management to consider more situational and local norms, morals, and practices (McCay 2002). Practice theory, introduced by Pierre Bourdieu (1990), has been used by many social scientists to bridge this gap between abstract structure and action, particularly in understanding human-environment relationships. Bourdieu suggested that knowledge and the "lived-in" world are inextricable, and internalized, tacit dispositions of habitus could not be disembedded from the social conditions of the actor. A practice approach considers the "simultaneous engagement of the human actor with nature and society" (Pálsson 1998:48), removing the limiting dualist framework of human and nature, knowledge and experience (Lave 1993). Situated in the uncertain and shifting environment of marine ecosystems, practice is understood as an emergent property of direct engagement. "Dwelling" within an ecosystem context (Ingold 2000) and the experiences and knowledge derived from "conducting one's life in a particular environment" are viewed as part of the active process of engagement and decision making in a changing social and bio-physical environment.

With this case study, I take the perspective of the embedded commons to explore how a small community of fishers use and relate to their environment in practice. I hypothesize that in Haloban, the commons and artisanal fishers' practices are embedded in a dynamic, coupled social and environmental context. I wanted therefore to invert the new-institutional analysis frameworks that sometimes fail to address the direct and inherently negotiable relationship between fishers and their complete socio-environment, by starting with the fishers' actions rather than the institutions. Approaching fishing commons as a coupled social and biophysical context (Liu et al. 2007), I posited that I might encounter tacit phenomena affecting resource use that are not frequently addressed, yet relevant, in resource

management planning. Although I initially focused my study on the activities of fishers in the environment outside of the village, with experience I began to also see the importance of social relationships and institutions outside of the commons as well, and incorporated more cultural, economic, and discursive information into my analysis. Disturbance and change were evident in both the social and biophysical spheres, and also became important to shifting processes.

Haloban is located in Pulau Banyak, a group of many islands in Indonesia's westernmost province of Aceh. Geographically, Pulau Banyak is a group of fringe coral reef islands in the Indian Ocean between Simeulue to the north and Nias to the south. The tropical setting is home to diverse marine and terrestrial habitats including coral reefs, mangroves, and tropical rainforests. It is also home to approximately 7,000 people, about a fourth of whom are members of the Haloban community and all of whom have nearly exclusive access to the reefs and islands. Socially, Haloban is complex: it is historically and ethnically heterogeneous, with no easy categories of indigenaeity to fit models for traditional tenure rights, and a highly exogamous, mobile, and externally-connected population. In 2004 and 2005 Haloban experienced two devastating tsunamis which created reverberating disturbances in social and biological areas, altering not only reefs and mangroves, but neighborhoods, livelihoods, and expectations for the future. Fishing still remains the primary economic activity of Haloban residents, employing a variety of small-scale artisanal methods.

Haloban's artisanal fishing in an exclusive resource area had not been previously studied, and offered an intriguing example of the connected social and biophysical spheres. I visited Pulau Banyak in 2010 as a volunteer with Yayasan Pulau Banyak over a one month period, which provided me with basic knowledge of the islands' environment and society. Drawing from this pilot study, I developed a research plan using ethnographic methods to gather both qualitative and quantitative data over a three month period while living in the community of Haloban. Participant-observation of daily activities was fundamental to my study, in both the village and at sea. I joined several fishing excursions and outings to observe, experience, and practice fishing, conducting focus follows with key informants from different backgrounds and taking part in the use of different methods, from diving to net fishing. I also employed several research instruments for quantitative data collection: a

household survey and semi-structured interview questionnaire, which were both refined after arriving in the village, and fish cards used for pile sorting exercises.

With this case study, I hope to inspire more recognition for the complex and dynamic social-ecological relationships that influence common-pool resources. Creating more localized and responsive frameworks of analysis for the commons is relevant to both social theorists and environmental practitioners. This research also directs attention to an ethnically-diverse, non-indigenous population in Indonesia that is uncommon in the literature. Whether or not local practices are inherently successful at managing resources sustainably is not the question; there is no doubt that these vary in their efficacy and influence, just like institutions. What is of import is the recognition that fishers' relationship to the environment is immediate and situated; it is not exclusively arbitrated by formal or informal institutions. The imposition of centralized rules that conflict with those practices and the processes that inform them may create conflicts in the management of the commons. Recognizing the commons as a social and physical environment in which practices are iteratively created will help resource managers to design more legible, responsive, and locally relevant projects.

CHAPTER 2

RESEARCH CONTEXT: APPROACHES, BACKGROUND, AND METHODOLOGY

This ethnographic case study examines artisanal fishing practices with emphasis on their social context. Fishing, resource extraction, and other human uses of the natural environment are frequently approached from an economic and governance perspective. Useful analytical tools for examining institutions of common-pool resource use have been developed from this approach; however, critics note the limitations of perspectives that view systems and institutions independently from social contexts in which they are embedded, particularly the lack of attention paid to emergent, situated practices. In the coral reef islands of Pulau Banyak, fishers have few institutions and rules to regulate behavior, but there are additional unarticulated practices that emerge in use. Attending to micro-level processes, this study considers how people are actually engaging with their environment through resource use, particularly the activity of artisanal fishing, and the social and biophysical processes in which the actors are embedded. Using qualitative as well as quantitative data developed over an eleven week study, I examine the diverse and flexible ways that the Haloban community is engaging with their environment.

RESEARCH OBJECTIVES

For this study, I focus on the Haloban community's practices of resource use as an entry point for exploring the social processes in which the commons are embedded. Fishing and other methods of sealife extraction are the primary way people engage the natural marine environment, a "seascape" that is both a natural physical space and a social entity created through repeated action and experience. Therefore, I investigate both use of the natural environment and the emergent social properties of that engagement.

My first objective was to collect data on the actual marine resource use by Haloban fishers: the key species targeted, the gear and techniques used, and the intended purpose of the catch, either for household consumption or sale. Secondly, I wanted to look at the

physical and social relationship between fishers and the seascape: their use and frequency of engagement, as well as community attitudes and perceptions of fishing and the reefs and mangroves. Lastly, I hypothesized that some Haloban fishing practices are tacit and situated, reflecting fishers' ongoing negotiation of shifting realities and expectations in their dynamic social and physical environment.

The overall goal of this project was to identify social processes involved in natural resource use by artisanal fishers in Haloban, as a contribution to the commons discourse as well as an important consideration for conservation planning. While the commons have been explored and explained from an economic perspective, many anthropological issues—power, history, and other social processes— require more exploration in the context of natural resource use (Bardhan and Ray 2008; Bromley 1992; Neumann 2004). Environmental management approaches today emphasize using local institutions and community involvement for responsive and socially equitable programs. Strategies for conservation and sustainability require an awareness of how ecological and social spheres are coupled and interrelated. As expressed by Kaplan and McCay (2004), "The 'human' dimension of the management process has not been given the full attention it deserves", and more data are critically needed to understand how local perspectives can be integrated with western approaches and capacity to improve sustainability (Acheson 2006; West et al. 2006). Although I had an interest in how fishing practices could ultimately shape the reefs and fisheries, my focus for this project was confined to the lived practices of fishers, rather than measuring the impacts of those practices on the marine resource. In other words, I looked at the process rather than the outcomes.

THE EMBEDDED COMMONS

Fisheries have been used as a frequent case study for ecological, economic, and anthropological studies of the commons (Begossi 1995; Knudsen 1995; Ostrom 1990) Marine resources are physically vast, undifferentiated, unbounded, and difficult to quantify, presenting particular challenges for the commons debate. The commons are a defined but pliable physical and social space, described as any resource to which a large number of people have access (Ostrom 1990; Ostrom et al. 2002). While some commons are open-access, most are limited to a particular group, who often develop mechanisms for regulating

use, though not all succeed in supporting sustainability and preventing overexploitation. Most research on the commons is motivated by conservation and sustainability goals, in particular, the new-institutionalist approaches that seek to identify the "key variables" that "promote successful common-pool resource management" (Dolšak and Ostrom 2003:12). Many of these variables are related to the economic, political, and legal "environments" that influence institutions.

However, these analytics have developed from a particular economic epistemology which allows for the separation of the actors from these environments and the larger social context. The new-institutional approach privileges units of analysis that are "dis-embedded" and comparable across cases (Dubash 2004). Yet, those institutions may not be effectively extractable from the social and environmental contexts (Bardhan and Ray 2008; McCay 2002; Peters 1987). If we take an embedded perspective of the commons, it "helps counter the abstraction of the apolitical and self-regulating market" proffered by economic epistemologies (Dubash 2004). It also allows us to consider the profundity of events and disturbances in Haloban, such as tsunamis and tourism, which are continuing to inform the viability and purpose of institutions, and the development of values and norms that are infusing resource use. Finally, disassociating social phenomena from the actors and context prevents us from "penetrating the dynamic of a commons, which is necessarily a social system", and removes meaning from the observed phenomena (Peters 1987:193).

Landscape— and seascapes— "are continuously in the process of becoming through the actions of particular individuals in particular places, at particular times" (Gezon 2006:183). They are more than their biophysical elements; human interaction constructs a social environment as well, which is constantly recreated with historical, political, and cultural inputs (Ingold 1993). A focus on institutions, categorized as formal or informal, places emphasis on rules that can be articulated and enforced, underplaying the norms, values, and patterns of behavior that "may or may not be shaped by rules and lead to changes in them" (McCay 2002), including practices. Understanding the commons of Haloban therefore requires attention to the processes and experiences of the "lived-in world" (Lave 1993), not just the institutions that inhabit it. For this case study, I subscribe to this situated perspective, and consider the actions and practices of fishers as an entry point into the common's social context.

ARTISANAL FISHING PRACTICES

Artisanal fishing generally refers to small-scale, low-technology techniques for fishing employed by rural or "traditional" fishers in some of the most marginal and vulnerable communities on the planet (IUCN 2008; Marin et al. 2010). In contrast to large-scale commercial fishing which employs multiple crew members, uses radar and other technological advantages, and covers great distances to procure desirable species, artisanal fishers are usually working alone or in small groups, using boats that cannot cross open seas, and targeting areas within a short journey from their residence. Millions of people living in the vital coastal marine regions around the world are artisanal fishers, and in recent years greater attention has been paid to their organization, practices, and impacts on marine resources (Cinner and Aswani 2007; Cordell and McKean 1992; Marin et al. 2010).

Artisanal fishing frequently occurs in a commons setting, which makes it an ideal (and frequent subject) for testing theories of common-pool resource use and regulation.

Dolšak and Ostrom (2003) assert that we must acknowledge that social institutions may already exist in places where we do not initially recognize them; whether these institutions support sustainability or not, they are the best place to begin for creating rules that resonate with the characteristics of the resource and its users. This recognition has brought attention to local and indigenous tenure systems (Affif and Lowe 2007; Armitage 2003). Studies in Indonesia have explored institutions of customary marine tenure (such as sasi) which are often operating independently or alongside legal frames of marine resource regulation (Glaser et al. 2010; McLeod et al. 2009). These studies are used to support common-property approaches that consider homogeneous, indigenous communities employing "traditional" practices to be examples of common-pool resource management; however, there are fewer studies in Indonesia or elsewhere that address the internal differentiation and diversity of a community, or the uneven effects of resource management schemes on individuals and groups (McCay 2002). There is increased recognition that while "small-scale" does not equate with "sustainable", there are often existing institutions, social conditions, and practices which must be addressed in conservation and sustainability schemes. Yet, these practices are a challenge to capture in cognitive models of knowledge that stress the separation of the mind from the experience of the physical world (Lave 1993).

Practice theory provides an approach that "emphasizes the creative and generative processes of the place-based actions themselves" (Lauer and Aswani 2009:323), and avoids the decontextualization of social phenomena that occurs with new-institutional approaches. Bourdieu (1977) introduced the concepts of practice theory as a counterpoint to rational actor and cognitive frameworks that dichotomize the mind and body, knowledge and experience, making it especially fitting for breaking the autonomous economic man bias in new-institutional theories (Pálsson 1994). With a practice approach, social phenomena are considered embedded in a dialectical process, or as Anthony Giddens theorized, social systems are "both medium and outcome of the practices they recursively organize" (Duranti 1997:11). "Doing" and "knowing" are "an open-ended processes of improvisation with the social, material, and experiential resources at hand", which create a situation for adaptation and invention (Lave 1993:13). This perspective has been employed by linguists to understand how languages emerge in use, beyond the "rules" of grammar (Duranti 1997), as well as by psychologists (Lave 1993), and anthropologists (Ingold 2000; Pálsson 1998) to understand adaptive human activity, knowledge, and skill in unpredictable contexts. Practice approach is especially enlightening in addressing human-environmental interactions as "situated in immediate experience and direct engagement with everyday tasks" (Pálsson 1998:52). Cooperation between the abstract, cognitive model and the more tacit, in-place approach of practice may benefit our theoretical perspective (Bloch 1991) and management schemes in the uncertain context of marine ecosystems (Pálsson 1998).

ON THE FRINGE

This section provides a brief description of Haloban's social, political and environmental history—the context for practice. The islands of Pulau Banyak are on the periphery of practically every center: political, cultural, or ecological; of course, this is what makes it instructive, since the fringe is where complex relationships are most exposed. West of Sumatra in the Indian Ocean, this group of islands lies in a tropic zone with dry and wet seasons and tremendous marine biodiversity within its fringing coral reefs. The islands are politically part of the province of Aceh, which has recently transitioned from decades of separatist conflict to a mostly peaceful Muslim state. The region is home to dozens of indigenous ethnic groups and languages, and thanks to centuries of trade, migration, and

colonization, a dizzying amount of borrowing and blending with external cultures and languages. Adat customs in Haloban are a blending of political and cultural institutions derived from this mix and frequently reconstructed and re-envisioned. Issues of transnationalism and globalization have long been experienced in this seemingly remote region, as represented in Haloban's current ethnic, linguistic, and social diversity.

Location, Geography and Environment

Haloban is located in Pulau Banyak, a group of islands off the west coast of Sumatra's northern tip in the Indian Ocean, the most western part of the Indonesian archipelago. These islands lie at the center of a triangle formed by the Sumatran coast approximately 35 kilometers to the east, the island of Simeulue 80 kilometers to the northeast, and the island of Nias 60 kilometers to the south. They span an area of nearly 60 square kilometers. Recent surveys approximate around 71 islands and additional mangrove stands in shallow off-shore areas (Venegas and Morales 2009), although locals count closer to 99 islands. At the western end of the group sit the two largest islands, Tuangku and Bangkaru, with the smaller islands tucked protectively between their northeastern flank and the Sumatran coast. The islands vary in their vegetation: smaller islands may be mostly sand with a few coconut trees, while larger islands boast hills and peaks covered in dense rainforests ringed by mangroves along the shore. Underwater habitat is even more varied, with intertidal mangroves, fringing coral reefs, sand, and sea grass covering much of the sea floor between the islands. The islands experiences monsoon seasons: rains usually falls frequently from August to January, followed by a dry season from approximately February to July (Venegas and Morales 2009).

Coral Reefs, Mangroves, and Species Diversity

> With respect to fringing, or shore reefs … they differ from barrier-reefs in not lying so far from the shore, and in not having within a broad channel of deep water. Reefs also occur around submerged banks of sediment and of worndown rock; and others are scattered quite irregularly where the sea is very shallow.
>
> — Charles Darwin
> *The Structure and Distribution of Coral Reefs*

The coral is home to many species of pelagic and coral fish known to the Indian Ocean and Andaman Sea (see Appendix). Fringing coral habitat is common throughout the Indonesian archipelago, and shares the same extraordinary biodiversity and sustainability challenges found throughout the region. Southeast Asia's marine environment is widely recognized for its unique biological density and endemism, and Indonesia's long archipelago is home to 18% of the world's total coral reefs and approximately 60% of the world's hard coral species (Burke et al. 2002). In the intertidal zone, mangroves produce biomass and nutrients, serve as a nursery for juvenile fish, and shelter mollusks and crabs at its nutrient-rich base (Environmental Justice Foundation [EJF] 2006; Mumby et al. 2004). Mangroves and sea grasses bind soft sediments from runoff, preventing erosion and removing silt that might otherwise impede coral growth. The reef, in turn, buffers waves and minimizes erosion of soft sediments needed for the mangroves and sea grasses, while providing varied habitat for adult fish to feed and spawn and meadows for grazing sea turtles.

In Pulau Banyak, the health of these systems today is extremely variable. Coral cover varies greatly among the islands, with porites or stony coral, blue coral (Heliopora), staghorn and branching corals (Acropora) varieties covering from 10-50% of the underwater coastal area (Venegas and Morales 2009). The coral is home to many species of pelagic and coral fish known to the Indian Ocean and Andaman Sea, along with common varieties of cephalopods, gastropods, and crustaceans. There is visible damage from crown-of-thorns starfish (Acanthaster planci) predation, algae, and silting near dead mangroves, as well as human impacts including boat damage, mining, blast and poison fishing. A bleaching event that struck much of western Sumatra in 2005 also appears to have impacted coral health (Venegas and Morales 2009). Today, coasts are covered in many dead mangrove areas; tsunami damage is usually the suggested cause, though sea level changes from tectonic shifts and climate change, and clearing groves for rice farms and new settlements are other possible factors. This relationship between habitats in not lost on Haloban's fishermen, who recognize the importance of their health for their fish stocks, and the impact of the loss of coral and mangroves has had on fish abundance, size, and species diversity (Panglima Laot, conversation with author, September 1, 2011).

Cultural, Historical, and Political Background

Pulau Banyak lies at the southernmost area of the province of Nanggröe Aceh Darussalam, a Special Territory of Indonesia. This status stems from an agreement made in 2005 to end a violent conflict between Indonesian nationalists and the Free Aceh Movement (Gerakan Aceh Merdeka, or GAM), which lead a guerrilla separatist movement since 1976 (Drexler 2008). The agreement allows for some autonomy, such as the inclusion of Sharia law in provincial legal frameworks. Aceh is culturally heterogeneous: within the Province of Aceh there are over 49 distinct indigenous ethnic groups which retain unique characteristics and languages (Soekanto 1981). Acehnese is the dominant ethnic and linguistic group and provincial business is conducted in both Bahasa Indonesia and Acehnese. The region has also been a crossroads for trade and migration between South and Southeast Asia, further adding to the diversity.

After the peace accord of 2005, Aceh needed to develop a more unified Acehnese identity, in contrast to the Indonesian national identity, and Aceh's political discourse began to emphasize its unique and united history as "Mecca's Veranda" for its position as the gateway to the Islamic world. Trade with the Muslim world was documented as early as the 6th century, but it was in the 13th century that the ruler of Aceh converted to Islam, allowing for a slow integration of Islamic values and influence in Sumatra and beyond (Church 2006). While Christianity and other religions are practiced here, the vast majority of residents today are Muslim. Islam became fundamental to the contemporary Acehnese identity (Drexler 2008) and Islamic principles have become an accepted foundation for the Acehnese politics and law. The domestic and international press report on actions by the Sharia police with sensational details, and even academic writings provide truncated definitions of Sharia as including "the use of public lashings, publically parading alleged prostitutes, and casting judgment on women's attire" (Anwar 2009:446). Although Muslim religious identity sometimes supersedes other subjectivities and ethnic identities in Aceh (Andaya 2002; Rodgers Siregar 1979), enforcement and attitudes about Sharia are diverse and more political than religious, from my own observations-- individuals and social groups have highly differing opinions on what Sharia means, how it should be enacted, and its relevance to governance and the law.

PULAU BANYAK

The first recorded settlement of the Pulau Banyak islands took place in the 19th century, by people from Simeulue. Indications are the area was known by Simeulue and possibly Nias fishermen well before, and the first settlements were temporary, bringing resources from the islands and coral reefs back to villages in Simeulue. A permanent settlement and a new Sultanate was established in the 1800's at a site known today as Kampung Lalu [the old village]. The Sultanate ended in 1951 when the last Sultan died and the area was declared part of the province of Southern Aceh, North Sumatra within the young Indonesian nation (Hasbi 2011).

Today, many people in Pulau Banyak continue to identify culturally and linguistically with Simeulue, and migration and trade appear to have remained continuous through the past two centuries. A local dialect is called *Melayu*, identified by speakers as related to the language of Simeulue but distinct. Since Kampung Lalu was first inhabited, many other settlements have been established in Pulau Banyak. Today, there are three main villages—two on Tuangku and a third on a small island on the east end of the group—with countless other small hamlets, some a collection of two or three related households. Until 2010, the entire area was under the jurisdiction of a single district. A western district (*Kecamatan Pulau Banyak Barat*) was established in July 2010 with Haloban as the seat of power.

ADAT

Adat is a broad term used to categorize the numerous local and indigenous customs and traditions of Indonesia, particularly customary law (*hukum adat*) (Bowen 1988; Soekanto 1981). While *adat* is often associated with ethnicity, it is better understood as a facet of social relationships within a diverse community. *Adat* customs of land tenure are recognized by the state (in highly generalized terms) as a pluralistic legal system, which is why it has become so relevant to the political ecology of natural resource rights (Acciaioli 2001; Brosius 1999; Li 2000). In Haloban, *adat* is a plastic cultural phenomenon, drawn from many sources and expressed at many levels. Only a few Haloban residents identified themselves as ethnically Acehnese, yet the Acehnese *adat* station of *Panglima Laot*, a leader and representative of fishers for the community, is recognized as a local custom. There are also traditions of dance, marriage, and circumcision that are considered *adat Haloban*:

locally generated and unique, though reminiscent of other Sumatran and Muslim traditions. Whereas *adat* is generally thought of as separate from Islamic and state legality, in Haloban the systems are sometimes integrated. For example, fishing on Friday is prohibited by Islamic custom, a rule enforced by the *Panglima Laot*, who reports to a provincial government bureaucracy in Banda Aceh. *Adat* is an important consideration for the governance and practices of fishing in the Haloban community.

METHODOLOGY

> Instead of basing policy on the presumption that the individuals involved are helpless, I wish to learn more from the experience of individuals in field settings
>
> —Elinor Ostrom
> *Governing the Commons: The Evolution of Institutions for Collective Action*

Ostrom was advocating institutional models that included a more contextually-relevant, experiential perspective. This study's methodology is based on this value, using ethnographic research methods to provide perspective on actual practices and emic perspectives from the field. My research methods employed traditional ethnographic methods to address these topics, including a household survey, focus follows, and key informant interviews while living in the village over an 11-week period.

Primary research took place over an eleven week period within the village of Haloban from late July to early October, 2011, with two additional months of prior research and experience in Indonesia and specifically Pulau Banyak Barat. I did a pilot study in Pulau Banyak in June 2010 as a volunteer for Yayasan Pulau Banyak (YPB), in which I participated in conservation activities on Bangkaru and conducted a survey in another village about local perceptions of conservation and development efforts. Although I was a solitary researcher for my thesis study, I had support and assistance in the field from three native research assistants, as well as many other community members and stakeholders. Traditional anthropological methods of participant observation were employed, with research conducted on a daily basis in the village, particularly at homes, the fish market dock (gudang) and nearby coffee shops (warung kopi) frequented by fishermen. To research situated practices of fishing required active participation and experience, and I spent over 100 hours at sea conducting focus follows, observing practice, and actively fishing. A household survey provided quantitative data from 92 households (out of 294) on standard of living,

consumption, education, and personal views of fishing, especially after the tsunami. Informal and formal interviews were also conducted with fishermen, local leaders, and community members, including (8) semi-structured long interviews on fishing. Women provided the most information about mangrove gleaning practices for mud clams, as well as details about household activities, consumption and expenses.

Aside from time, there were limitations to the research related to language, my gender and fishing skills, and the physical environment, which I considered and worked to compensate for whenever possible. I studied Indonesian prior to fieldwork both in the United States and at a language school in Yogyakarta, Indonesia to achieve intermediate fluency in Bahasa Indonesia, and employed translation assistance for survey instruments and interviews in local dialects. My research overlapped with both the fasting month of Ramadan and the start of the wet season, which required flexibility in my daily research priorities. As a woman with little experience with artisanal fishing my interest in participating in fishing trips perplexed many. It took the development of rapport, my personal network, and offers to buy fuel to overcome the confusion and hesitation, though that was still not enough to engage some fishers. There were also some practices that had considerable risk associated with them and which I chose not to participate in—night diving in deep waters in particular. For this, I relied on first-hand accounts from experienced specialists.

CONCLUSION

In this thesis, I take the position that specificity and an embedded perspective is underutilized in addressing the commons, and is an appropriate framework for addressing how fishers from the Haloban community actively engage with their natural environment. Being on the fringe of social and biological systems creates an ever-changing context of diversity and conflict. New-institutional frameworks presented by Ostrom and other common-property scholars have helped to identify and address the important issue of common-pool resource use, but its emphasis on codified rules does not leave room for situated practices that may also be part of resource use. Therefore, for this case study I chose to emphasize the practices of fishers, as an example of a dimension of resource use and users that has not been adequately addressed in new institutions discourse. If institutions are the consistent rules of the game, then perhaps practices are the inventive adaptations that emerge

for negotiating those rules and the rest of a social and natural environment. I hope this study provides useful perspective for local resource management, but also contributes to the larger discussion of how common-pool resources are understood by the actors who dwell within this environment every day.

CHAPTER 3

HALOBAN: A DIVERSE FISHING COMMUNITY

This project introduces the people of Haloban, a Muslim fishing community in the islands of Pulau Banyak. There are several ways to understand Haloban as a community, and it should not be taken for granted that this is a unified, impermeable, or constant unit of primeval origins. Indeed, the process of creating locality and community (Gupta and Ferguson 1992) is ongoing for Haloban, and its members draw from spatial, political, and cultural criteria, as well as the categories imposed on them by external powers, for identifying themselves as such. Here, I employ their own definition in its most open and inclusive sense, including individuals from separate villages and settlements that identify as a cohesive community, while also recognizing the great diversity of groups, ethnicities, linguistic communities, social statuses and genders within that community. This section presents the quantitative and qualitative evidence of that diversity and local social processes. Economically, there are modest differentiations between wealthier and poorer members of the community, represented in material items such as motorcycles or porch tiles. There is also little educational or livelihood differences between older members, but this is rapidly changing as younger members attend post-primary schools outside of the village. Short ethnographic descriptions are presented here to evoke the everyday experience of Haloban.

DESCRIPTIVE OVERVIEW

The Haloban community is mostly located on the island of Tuangku, the largest island in Pulau Banyak. Homes sit along the shore where mangroves were cleared, but more recently houses have mostly been built inland in the shadow of the rainforested hills. Along the foothills there are many gardens, comprised mostly of cassava, cucumber, banana, and durian, and a rice field that was cooperatively cleared just last year. Monkeys[1] and wild boar

[1] Species uncertain, there are no known studies of the islands' primates.

are frequent garden pests, and in the evening farmers will play loud percussion instruments to scare them away. Near the shore and up along the mouth of a small river, boats are tied to short docks or poles, many still laden with the plastic barrels that hold fishing nets. Children will congregate on these docks after school to fish with short lengths of line and borrowed hooks, the boys jumping into the water to swim and cool off when the weather is hot. In the evenings, people sit on the porch with their neighbors to chat well into the night, with a few men heading to the coffee shop for long discussions of politics or a game of chess.

The village of Haloban is not the sole locality for the community; residents of this village, the adjacent village of Asantola and other smaller neighborhoods and outlying settlements all identify themselves as part of the Haloban community. When encountering someone who resides in either village in another context, such as a shop in Singkil or on a boat in the reefs, they identify themselves as Haloban without distinguishing village or neighborhood. Haloban and Asantola do maintain separate identities as villages, as demonstrated by the existence of distinct *kepala desa* (village heads), *musholla* (prayer halls), and soccer teams. However, there is only one *masjid* (mosque) serving these groups, providing the physical space and religious-social institutions for a cohesive community identity.

Haloban is comprised of a tangle of ethnic and linguistic sub-groups. There are several different *suku* (ethnicities) self-identified, including Aceh, Padang, Batak and Nias, and even some who identify Javanese (Jawa) and Sulawesi (Bugis) roots (Table 1). Further, within these groups several *magda* (patrilineal lineages) are also recognized[2]. Community members speak Bahasa Haloban, a local dialect, and Bahasa Indonesia. There is also use of Bahasa Melayu, which is similar to the languages of Simeulue; Bahasa Singkil, a dialect of the mainland; Bahasa Nias; and Acehnese. Some residents also have working knowledge of Arabic and English, as studied in school. Languages are not ethnically proprietary: many people who are not of Nias decent have a degree of fluency in the language, and having a working knowledge of multiple dialects is the norm.

[2] Matrilineal lines are also maintained in the Batak, Padang, and Mandialing sub-groups.

Table 1. Ethnic and Patrilineal Affiliations of Haloban[3]

Suku **(Ethnicity)**	***Marga*** **(Patrilineal Line)**
Padang	Tanjung, Saniago, Mandailing, Dagang
Sinabang	Cenyago
Batak	Nasution, Utara, Barat
Nias	Jiga, Halawa, Harefa, Giawang, Gea, Waruwu
Aceh	None
Java	None
Bugis	None

The total population of Haloban is 1,578, with 294 identified as *kepala keluarga* (head of household), (Data Penduduk [Resident Data], Camat Pulau Banyak Barat, July 2011). Today, that population is concentrated in Asantola and Haloban, although just a generation ago many families resided among the smaller islands. The standard of living is modest; aside from those built by the *Badan Rehabilitasi dan Rekonstruksi* (the Indonesian tsunami relief authority funded by the World Bank) homes are mostly constructed of locally-sourced wood using coral rocks to elevate the house. Many have tin sheet roofs, though some employ palm fronds for thatched roofs, and a large number have cement floors, porches, and wells. Houses are designed with a large common room and one or two bedrooms, with the kitchen and toilet usually located in smaller structures at the back of the house near the family well or cistern. While most households have a cell phone, (owned by at least one family member, sometimes the teenager), amenities such as motorcycles and refrigerators are less common (see Figure 1). Some households qualify for food assistance given by the government and other poverty relief organizations and receive occasional donations of rice.

Income and livelihoods in Haloban are diverse and sometimes opportunistic, though fishing clearly dominates the economy. In the household survey, 80% of male heads of household indicated fishing was their primary occupation (Figure 2). Men pick up day jobs

[3] These are the self-identified *suku* and *marga* of participants, and do not necessarily reflect conventional categorization. Western anthropologists have been critiqued for creating a limited set of ethnic categories that are not emic (Lubis 2011). Researchers in this area emphasize the fluidity and adaptability of *adat* and the associated kinship systems (Rodgers Siregar 1981).

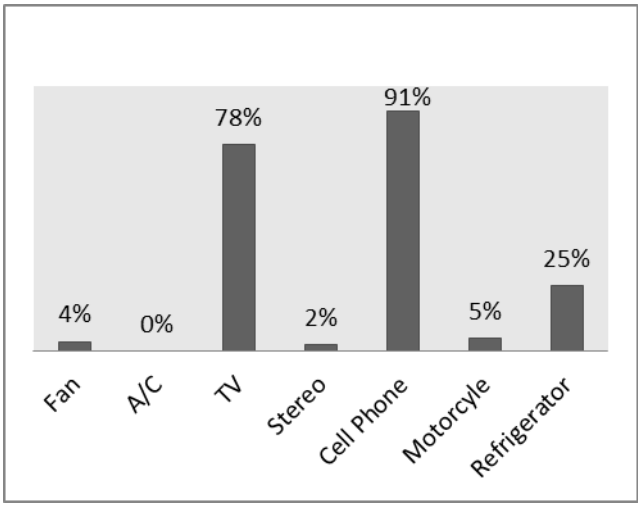

Figure 1. Household amenities reported in household survey, n=85.

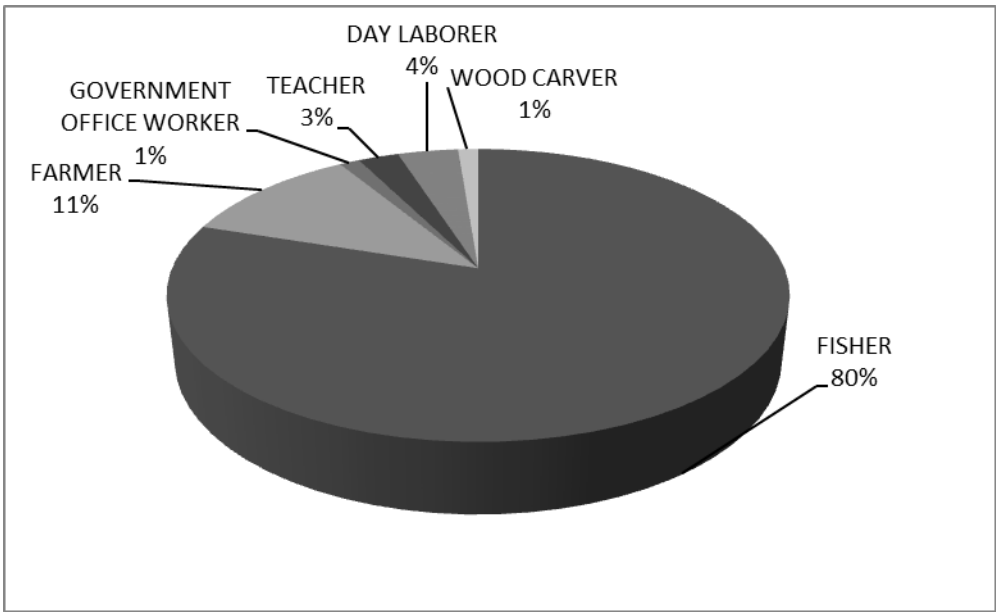

Figure 2. Male head of household primary occupation, n= 89.

unloading ship cargo, repairing roads, or constructing new government buildings, and for about 4% this is their main source of income. Another 13% of male HH indicated they were farmers (rice paddy or garden), though the majority only began rice farming within the last year. Many farmers and day laborers are former fishermen who lost their boats and gear with the tsunami. “Sebelum petani, nelayan. Sekarang, sehari-hari kerja di tani”. [Before farming, I fished. Now, every day I work the land”] (Survey Respondent 32, Sept. 2, 2011). While

this describes their primary occupation, most men engage in multiple occupations. Teachers and farmers also engaged in fishing for subsistence and cash occasionally, and most fishers' households also maintain gardens and rice fields.

This livelihood diversity is equally represented by women (Figure 3). The majority of women identified themselves as a housewife (50%) or farmer (39%), but many were observed to have additional income earning activities, including selling homemade snacks and cakes from their porch. Most women glean for mud clams in mangroves for food for their family, and some for income as well. They also accompany their husbands to support wage-labor, clearing land for construction or carrying supplies to worksites. Women's economic role has fluctuated over time, according to some accounts. Fishing is considered a man's profession, but I was told that a generation ago widows also fished. While women have always participated in gardening, in the past two years some have taken on more responsibilities, no longer creating traditional handicrafts for weddings and ceremonies in lieu of farming. Today, women head about 10% of Haloban households.

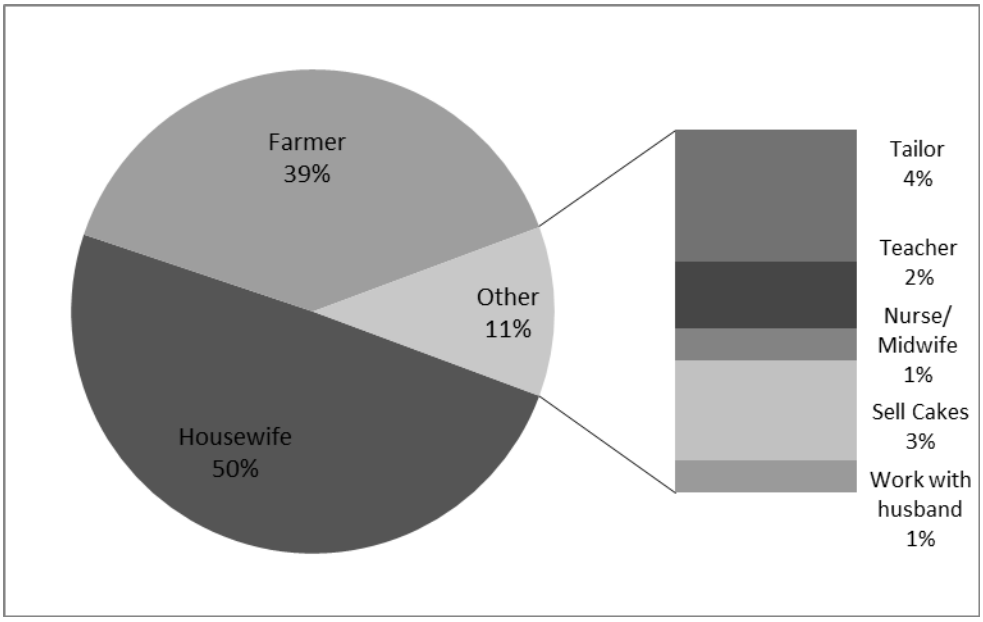

Figure 3. Primary occupation of adult women (over age 20), n= 98.

ADAT AND COMMUNITY INSTITUTIONS

Researchers have noted in Sumatran Batak communities an exceptional adaptability of *adat* systems with the inputs of hegemonic national values and changing economic and political contexts (Rodgers Siregar 1979). Haloban's *adat* is now more ceremonial than political, but still highly adaptable and reflective of multiple ethnic traditions, as noted earlier. When I spoke to Pak Mukim, the leader of *adat*, he was primarily concerned with "budaya" (culture), particularly his role in negotiating marriages, sponsoring traditional dance and music, and other events. Historical powers of governance may now be transplanted to state institutions; however, Haloban does maintain a few *adat* institutions of tenure, arbitration, and reciprocation that are common in Aceh: *mawah, gala*, and *sayam*. While Haloban's community consists of multiple ethnic traditions, they come together as a single *masaraykat adat* (local traditional community). Haloban articulates with the Indonesian nation-state and the Acehnese province in a bidirectional system of governance similar to what Tsing (1993) describes in South Kalimantan. These state institutions and the hegemonic values that emanate from the centers of Jakarta and Banda Aceh interconnect with the *masaraykat adat*.

Mawah is a system of profit-sharing when several individuals have contributed labor or share ownership in a harvest. The number of shares a person receives reflects the number of people in their household. While it may seem altruistic for households with more dependents to be entitled to larger shares, in fact, women often "ikut suami" [accompany their husband] along with their children to contribute their labor to the activities of the head of household. Many women in the household survey indicated their profession as "Ibu Rumah Tangga" [housewife], but also described working the family rice paddies six days a week. Only men were hired to labor on road repairs, but the wives and children of some men were witnessed carrying bundles of sand to the project site to mix for cement. On another building project, wives labored to clear jungle away where their husbands were hired to construct a new government office. I am uncertain if *mawah* is also used with fishing. Although on each fishing trip where I contributed labor I was given a share of the catch, the division was fairly even between participants except the boat owner, who took a double share.

Gala is an informal system of borrowing and reciprocation: if a person borrows a boat for fishing or an area of land for short-term crops, the borrower is obligated to provide a small share of their harvest with the boat or land owner (the amount is unspecified, and informants told me that here it was the act of acknowledgment that counts more than the actual gift). *Sayam* is in a way the other side of the coin: it is the method of reconciliation and recompense. When someone feels wronged by the actions of another, they take the issue to the *kepala adat* [traditional leader] for arbitration. My assistant Mr. A explains it this way: "maybe you hit me in the head, you have to pay for my medicine. Or I plant on your plot of land, Pak Munkim (the *kepala adat*) helps us find a compromise." He emphasizes this isn't "hukum kriminal"- no one is going to jail, instead this is "hukum keluargaan" [family law]. *Gala* and *sayam* are both somewhat informal, with no definitive method or amount for compensation; it is dependent on the situation and the people involved, and negotiated through a public ritual of discourse.

THE EXPERIENCE OF HALOBAN

Here are a few descriptive examples of the experience of daily life in Haloban that express common activities and the village's social and physical atmosphere.

The Coffee Shop and the Fish Market

It is a morning in late July, before Ramadan has begun. Walking down the paved road towards the dock, I arrive at the coffee shop (*warung kopi*) jokingly referred to as the Playboy club. Here, a dozen men are sitting under a shade in front of the building on long wooden benches along unfinished tables, chatting, smoking, and drinking coffee. A few more sit inside, watching television as they drink. A younger fisher invites me over to ask my questions about different fishing methods: line fishing for grouper, swimming for lobster, etc. A few men at the table speak in low tones to each other in an intimate conversation. "Menyelam bisa?" a man I don't know asks me; yes, I tell him, I can swim. Another man named Tran tells me there are large squid in local waters, indicating size with a gesture along his forearm, that you can catch bare-handed but "you must wear a mask to protect your eyes from the ink". We continue to discuss diving when a man with a severe limp joins us. He is a former compressor diver, injured he says by staying too long in the cold water which

crippled him. Just across the street, there are groups of teenage boys playing dominos. They play for pieces of coral picked off the ground which are used as markers—there's no gambling for money.

It is too early for boats to arrive with their catch, so I walk towards the Haloban soccer field, picking along a difficult unpaved road past the skeletons of homes abandoned after the tsunami. As I reach the field and the homes that flank it on each side, a boy of seven or eight is walking through the village, selling *tamban,* the small sardines eaten frequently in a spicy tomato *sambal*. He calls out in long tones: "taaaaambaaaaan- lima ribu!" [sardines- five hundred!] School is out today, a holiday before the beginning of Ramadan. A few other boys are on the field, flying small home-made kites. Women are taking laundry off the line; some were washing clothes just after dawn, and now in the strong late morning sun, it is already dry.

Around four o'clock I go to the *gudang* (fish market dock), but it is not crowded today. The fish buyer brings a net basket to a boat that has just arrived. The fishermen reaches up for it, opens up a compartment with water in it under the deck, and starts to put fish and octopus into the basket. The fish buyer hefts the basket along the deck, dumping the contents out on the deck in front of the scale to sort them by species. He puts groups together, weighs them, calls out name and kilos: "ikan campur: satu koma duo. Gurita: tiga koma limo" [mixed fish, 1.2 kilos; octopus, 3.5 kilos]. The fishermen lifts himself up onto the dock and walks to a little window where a big man, who is perpetually talking on the phone to check prices in Medan, prints a receipt and pays him. Five percent of his payment is withheld as a donation to the orphan's fund that all of the fishers contribute into with each sale to help the children and widows of lost fishermen. The fisher keeps two small yellowfin tuna in his hold, presumably to take home for dinner. Before he leaves, another boat arrives, more octopus sold for cash and packed up in bright orange plastic crates full of ice marked "HAL-MDN" (Haloban-Medan).

Fasting Month

Late in the morning, I head towards the dock to get a phone signal; the transmission tower is located on another island, and the *dermaga* (boat dock) is the best place to make a call. It is a cloudy, rainy, cool day—the wet season has begun, or what is known here as

"cuaca timur" [east weather] because the wind shifts, bringing storms from the east. After a quick call I head back to try to beat the rain, but I'm called over by the men at the coffee shop. There is no coffee or cigarettes now; it is *puasa*, the fasting month. The weather is bad for fishing today, they tell me, but those who are earnestly fasting do not have the energy to venture out frequently anyway, so they are not bothered by the weather. Besides, gas for the motors is in short supply since there has not been a delivery for some time due to the storms.

Walking back quickly, I can feel the rain about to begin and duck under a porch. An older woman, Rosma joins me and asks where I'm going, the polite way to begin a conversation here. She invites me to join her at her house across the street, so we run through the rain to her porch. We are joined by a few other women, who amuse themselves with questions about my marital status. Someone's grandson, a toddler, comes with another kid, drenched from the rain and giggling. He's very happy, even though he's made to change his clothes. Suddenly, as the rain begins to lighten, a man appears across the street from behind the house, walking up from the shoreline where boats are docked. Perhaps he was out fishing the night before and has newly returned home. He's carrying several large skipjack on a rope. The women jump up instantaneously and hurry over to him, shouting. He is quickly relieved of three fish, the women returning happily and chattering about dinner. I ask who he was, and they vaguely tell me he is "keluarga" [family]. One woman fetches a scale from inside the house to weigh them, all around a kilo each.

Net Fishing on Pulau Sikandang

On a grey morning, I am permitted to join my host's nephew on a net fishing trip. He and I are accompanied by another distant relative and an orphaned teenage boy who joyfully and skillfully works alongside the older fishers. While the nephew speaks Bahasa Indonesia with me, he speaks Bahasa Haloban with his adult colleague, who speaks to the youngest in Bahasa Nias. These three are a regular fishing party, using the nephew's boat and nets to catch the small *tamban* anchovies off the small island beaches. We travel about an hour towards the east until we reach the island of Pulau Sikandang. The island has several tourist bungalows built by redevelopment agencies a few years ago; now they are shuttered and unused. Arriving at a bay at the southern end of the island, we glide in with the engine off, one man standing on the bow looking into the water. He gets into the water, staring down,

discussing the situation with the other fisher still in the boat. Groups of the tiny teri fish *(Stolephorus baganensis)* leap out of the water. Suddenly, along the shore, a woman walking with a *parang* [machete] approaches. She and her family are working in the family garden nearby, and she comes to see what we are up to.

After a few moments of discussion, the men return to the boat, drop anchor and put on plastic shoes. Then they reach into the small boat's hold, pulling up buckets filled with net and drop them into the water where they float. The men jump into the waist-deep water, move close to the shore, and begin dropping their nets as they walk in opposite directions to form a half-circle with the shore. Now the younger team member jumps in and splashes around to scare the fish. After just a few moments, one man says "tarik", and they begin pulling the nets into the buckets again. We all then walk up onto the beach and begin squeezing the small fish through the holes in the net, popping hundreds of them out onto the sand in a pile. While the men begin to prepare the nets for a second round, the boy uses some floating wood to play and float around in the bay.

When take a break for lunch, roasting a few handfuls of the *tamban* in a fire, we are joined by another young man from Ujung Sialit, who was on the island gardening with his family. The men gossip and trade accusations of potassium cyanide poisoning: the visitor is a compressor diver, and insists it is fishers from Haloban, not his village, who are using the poison. My crewmates disagree and argue politely with him. Over the day we lay the nets out four times, taking advice about fishing spots from more pedestrians on the shore who were collecting firewood and coconuts. We continue cleaning the nets in the boat on the way home, but before the sun goes down we stop at another island, where men are repairing a cargo boat. One of our crew offers some of our catch to an older relative who is working there. The man and his colleagues take a few kilos of fish in a bucket before we continue on to Haloban.

CHAPTER 4

FISHING PRACTICES

Adult men of all social rank, even those who identified their primary occupation as something else, were observed fishing for sale and sustenance using a variety of practices. Fishers of Haloban are artisanal, using what they themselves consider "traditional" or low-tech methods and harvesting small yields for sale and consumption. For fishing, gleaning, and other resource extraction, governance is limited and there are only a few vague rules for use. Fishing grounds are considered open to anyone with no restrictions based on residency, ethnicity, kinship, or other institutions, but outsiders rarely enter the reef areas for fishing. Among fishers, there are regular unarticulated practices that were observed: respecting "first-come" privileges, self-spacing, and avoiding spaces that other fishers have recently visited. Haloban fishers also appear to target different species than their competitors from other villages, though there are no rules or traditions to direct that distinction. When pressed to explain the behavior, fishers state it is simply how it is done, and offer courtesy and morals as their justification.

SEDERHANA: PERCEPTIONS OF FISHING

When asked if fishing was a good living (*hidupkan baik*), fishers often told me it was neither good nor bad, it was rather "sederhana". The word translates to English as simple, humble, or rustic; and people generally indicated that fishing was "cukup", enough to get by, but not an easy life. In the household survey, 62% chose this word to describe fishing as a livelihood, while 12% of respondents used similar phrases like "paspasan" [barely] or "sedang" [fine]. One man explained his idea of *sederhana* this way: "hidupkan nelayan sederhana: tidak mejanjikan untuk anak ke sekolah. Untuk makan, bisa" [fisher's livelihoods are *sederhana:* can't promise to send the children to school. But you can eat] (Survey Interview 40, August 27, 2011).

Fishing was described by fishers as more difficult today than in the past, requiring more effort for several reasons. While only 12% of survey respondents described fishing as a

difficult profession, 91% consider fishing yields to be “lebih baik dulu” (better in the past). “We used to have heavy hauls, needed 2 people, 100 kilos a day... now more like 3 kilos a day, people don’t take a friend, they go alone” (Panglima Laot, conversation with author, September 1, 2011). Another informant described how in the past, a person could fish one day a week, but now you need to work several days and your money is gone by the end of the week. Others described needing ten times the effort or nets to catch the same weight of fish as you could before the tsunami and that now the fish seemed farther away. Many reasons were given for the difference: bomb fishing and cyanide poisoning in combination with the more severe effects of the tsunami were generally considered the causes.

Some noted changes in the size of fish and other target species like lobster and octopus: more than half of survey respondents said that fish used to be larger, and one fisher told me that "big ones have already been caught, only small ones left". Informants also indicated that along with decreasing fish stocks there was a decrease in diversity: “bermacam ikan sudah kurang” [the variety of fish has decreased] (Survey Interview, August 8, 2011). The Panglima Laot claims that many species of fish that were once common are now gone. Interestingly, no one mentioned overfishing as a potential reason, and it did not seem to be a concern. An exchange with “Mr. Black” while diving for octopus demonstrates:

> Mr. Black: No octopus, already gone (sudah habis). People come here every day. I can usually find 2-3, but today none.
>
> BQ: Do people worry about octopus or fish running out?
>
> Mr. B: No, people know fish come here to make babies, so people don’t worry about running out- if there’s no more octopus, they get fish instead. They know coral is still 80% good, as long as there’s coral, no problem, we’ll have fish.

DESCRIPTION OF FISHING METHODS AND GEAR

Fishermen in Haloban target diverse species in varied habitats and use several distinct gear types (Table 2), but practice a lower-tech fishing method in contrast to other villages of the archipelago. Coral and mangrove species are the primary targets of fishing activities, and while some fishing occurs in deeper ocean waters, most fishing is done in waters less than 5m deep. All Haloban fishermen employ small canoe boats (*perahu* or *kanu*) run by solitary fishermen or up to four companions. (There is some occasional fishing from village shores and docks, though casually and mostly by children.) Although as recently as 2008 many still

Table 2. Fishing Methods Reported by Survey Respondents, n= 66

Line	Lure	Net	Diving	Spear Gun	Compressor diving
34	6	14	24	1	4

paddled in the islands, all fishers interviewed and observed today use 5.5 HP onboard motors (*robin* or *honda),* only paddling or punting when they reach a fishing area. Engines were in use in Haloban prior to the tsunami, but they became ubiquitous after relief organizations distributed over two dozen motors along with new boats and nets. Fish are caught with live-baited hook and line, lure, floating nets, and spear guns, while crustaceans, mollusks and cephalopods are captured by hand by free-diving or the use of air compressors. Fishers also report the use of potassium cyanide (*racun* or *potas)* by divers to stun lobster, octopus, and live catch fish (no one self-reported this activity). Most fishers practice multiple methods, bringing different gear types along to be prepared for changing opportunities at sea.

Following are descriptions of different fishing practices including time of day, gear use, and species caught[4].

Live Bait Fishing (Memancing)

Bait fishing is primarily conducted in mangroves and less frequently in coral reefs. Fishing in mangroves is a solitary endeavor, with no requirement for more than one person on the standard canoe boat. Fishermen procure live bait either by buying it at the fish dock from net fishermen who specialize in local species of *Sardinella gibbosa* (tamban) or by netting it themselves. So in addition to the simple line, hook, and eye that is used for fishing, they also require a floating net, about 1 meter deep and 100 meters long. As with all forms of fishing in this area, a low horsepower engine is also necessary for reaching productive fishing areas.

Mangrove fishing takes place primarily at the eastern end of Tuangku about an hour's trip away, where mangroves were not as heavily damaged by the tsunami compared to areas closer to Haloban. The target species of mangrove fishermen are a mud grouper of the genus *Epinephelus,* (grapu bakau), which if caught live, earns a high price for export—three times

[4] Species were identified in consultation with fishers using photo references (Allen et al. 2010; Fishbase 2012)

the price of dead catch per kilo. Mangrove red snapper, *Lutjanus argentimaculatus* (kakap merah or ikan batang) is also a coveted target for export sales to Medan. Other frequent catches include mackerel *Scomberomorus commerson* (jompol or gumbolo) and rabbit fish *Siganus vermiculatus*, which are consumed locally. Fishers position their boats along the mangrove edge to begin casting with a pendulum swing into the roots. Punting his boat along the edge of the mangroves, he casts the same bait three or four times, slowly pulling the line in as a lure.

Trolling (Irik)

Trolling, called *irik* or *pancing jalan*, targets roaming schools of pelagic species that enter the area such as tuna: *Thunnus obesus* (ambu), *Thunnus albacores* (tongkol), yellowtail *Thunnus tonggol* (sisi begigi); jack *Caranx lugubris* (gabu); and giant trevally *Caranx ignobilis* (gabu meramoto) that feed in the coral reefs and bays. This is often practiced opportunistically whenever a fisher is traveling between locations. Lures are not sold in stores; they are handmade by fishermen from pieces of light wood and finely-cut snack bags, whose colorful outer designs and metallic interiors make them ideal for lures. To troll, the fisher drops the lure into the water and extends several meters of line while the boat is motoring along, tugging the line gently back and forth with a wrist movement[5]. While lure fishing is the most common technique, used even by recreational fishermen, it is still viewed as requiring skill and experience to identify a bite and effectively pull in a large powerful fish. The line is brought in without a reel and requires technique and strength, pulling hand over hand on the raw line, cutting and blistering the fingers.

Net Fishing (Jaring)

Many fishermen reported using nets provided by tsunami relief organizations in 2005, which are consistently 100 m long and 10 m deep, with small weights along one side and floaters on the other, with holes approximately 5 cm in diameter. No nets were reported or

[5] In conversation, fishermen often illustrate their tales of fishing by mimicking the wrist movement. When I imitated it to help communicate questions about fishing, it was recognized immediately.

observed to be made entirely in the village, only repaired locally. These nets are used for catching shrimp, small coastal fish, and larger migratory fish in shallow waters.

Shrimp (udang, udang kecil), are caught in the mangroves and bays close to Haloban around dusk by teams of two or more. Shrimp are less popular for consumption than the ubiquitous *tamban,* a small sardine-like *tamban* fish *(Sardinella gibbosa*) that is a staple of the local diet, as well as a common bait fish. *Tamban* are found perennially at all times of day near sandy shorelines and mangroves. To catch them, nets are set in shallow shore waters, usually in a semi-circle with the beach; then, fishermen splash to scare the fish into the nets. While catching the fish is quick, dislodging them from the net takes much more time and dexterity to pull them through the holes.

Larger pelagic fish enter the shallow shore waters for feeding on the small *tamban* fish at certain times of the day, particularly in the early morning, which requires different environmental knowledge and technique for fishing. Like small-fish net fishing, nets are also laid out in shallow waters in half or full circle patterns by two or more fishermen. Once caught in the net, fishers club the large fish to subdue it.

Diving (Menyelam)

Diving is considered the best option for the poorest fishermen, as it can yield high returns of export species such as octopus and lobster using inexpensive, easily obtainable gear. Free diving without an air supply is the most common method which uses minimal equipment: mask, snorkel, sometimes flippers, gloves and lightweight long sleeve shirt and pants, and a metal hook attached to a long wooden pole and metal rod for the catch. The rod is used to stab or spear the octopus by hand, or to irritate the octopus when hiding in a cave. Once the octopus is injured and grabbing the rod, the hook is inserted to attract the other tentacles and both are pulled out to extricate the octopus from its hiding place. For lobster, no rod is needed as divers use their hands to grab them from crevices in the coral. Divers had varying sequences and rhythms for this process, sometimes waiting a moment before hooking the octopus, sometimes leading with the hook, depending on situation. Night divers also use a flashlight for both visibility and to naturally stun lobster with the light. The clothing worn by divers not only provides protection from coral and tiny jellyfish, it also prevents an octopus from suctioning to the diver when being extricated.

Sling spear guns—homemade devices that use thick bands of rubber to slingshot a metal shaft into the prey—are sometimes used for the octopus initial attack, but more often are used to target coral fish, primarily for personal consumption. Shooting fish with a sling spear gun requires strength to reset the bands and stamina to remain still at the ocean floor while taking aim. A catch is sometimes attached to the waistband or skewered with the shaft to carry while continuing to dive without returning to the boat. Topshell *(Trochidae* family) known in Haloban as *lola* is also collected from the seafloor. Most divers reported choosing their dive spot based on good past experience. Like other fishermen, divers are typically active for several hours, from morning to dusk or dusk to morning for night dives.

Compressor diving is less frequent in Haloban, but is used very frequently in other Pulau Banyak communities. It uses a pump and long hose to bring air to divers and extreme depths, with weights (large coral rocks) tied to the ankles for ballast. Divers do not use any other gear, such as wet suits, pressure gauges, or radios. Diving of this type typically occurs at night and in the deep, open waters where currents and waves are strong. Two local men with lower-body paralysis report they were injured while working as compressor divers. Compressor divers specialize in coral lobster *Panurilus penicillatus* and *Panurilus ornatus* (udang karang, udang mutiara), sea cucumbers *Holothuria pardalis* (sualo), and other deep water species.

Bombing and Racun (Potassium Cyanide)

As mentioned before, there are only two fishing practices that are formally illegal in Haloban: using dynamite bombs or potassium cyanide, known locally as *racun* or *potasium.* Both practices are documented throughout Indonesia, as are the highly destructive and long-lasting impacts on coral health and biodiversity (McManus et al. 1997). The past use of dynamite is freely admitted by older fishermen, but all strongly insist that the practice has been abandoned by local fishermen for many years. (There was no observational evidence to the contrary.) They describe how, in the past, they would drop a small amount of explosive in the water and wait for bubbles. Sometimes they would dive to harvest coral broken in the blast as well as the many coral fish stunned by the blast.

The use of potassium cyanide is different: no one openly admits using it, though there are frequent rumors that fishermen (always from another village) were seen using it.

Potassium cyanide is carried in a small bottle and squirted onto areas of coral where there are grouper or lobster. It paralyzes the target, allowing for easy capture even during the day when lobsters normally hide from divers, and keeps them alive to earn the higher live export price. Udang mutiara, *Panulirus ornatus* (pearl lobster), found at low depths primarily by compressor divers using potassium cyanide, is bought live for ten times the price per kilo of octopus, 33% more than any other lobster species. Several divers report they have seen the results of recent poisoning: a trail of dead fish or coral as the poison was disseminated over the reef by currents. Even though many divers who dislike the practice complain openly about it, they never implicate anyone from Haloban and no one described using the poison themselves. As seen in Celia Lowe's research in Sulawesi (Lowe 2000, 2006), the blame for these practices is a political process that may target disenfranchised users and distort what is happening, rather than reflect actual threats.

Gleaning

The only marine resource exploitation practiced almost exclusively by women is gleaning for mangrove mud clams *(Anodontia edentula)*. Mangrove gleaning is done during the day, either in short local trips for a few hours or all-day excursions. Women practice gleaning in groups of kin, including teens, and stay close together for protection from crocodiles. Women wear socks and protective plastic shoes, long pants and long sleeve shirts (which protect from both sharp sticks in the mud and mosquito bites), and pin their *jilbab* (hijab) to securely cover their hair and neck. Splitting into different directions they walk through knee-deep mud, pulling their fingers through the mud. When clams are found, they are pulled up and shoved into a rice sack to be dragged along as the search continues. Once their sacks are reasonably full, the women sit in the shade to shuck the clams. The shells are discarded in piles, the meat placed in a mesh bag. Then, when the piles are finished, they return to trolling the mud to fill the rice sacks again. This cycle can be repeated several times on an all-day trip, with about half of the total haul shucked before heading back to the boat. Gleaning harvests are only consumed locally. One family of women glean up to two times a week for a full day and sell most of their haul for 5,000 IRP per kilo, but most other women glean only a few times a month for shorter periods for household consumption. Unlike fishing, gleaning is permissible on Fridays.

UNARTICULATED FISHING PRACTICES

Regardless of the fishing method or gear, a few unarticulated practices were observed. These are practices not proscribed by formal laws or established customs; they are emergent from a shifting context. In particular, behaviors of first-come privileges, self-spacing, avoidance of repetition, and species specialization between Pulau Banyak communities were noted. I include mangrove clam gleaning with fishing is because mangroves are also considered a zone of communal access, with similar absence of formal institutions. While data in this case is shallow, I did observe some possible "self-spacing" of gleaners here too. In all, these unarticulated practices should not be overlooked in resource management schemes.

First Come Privileges

When a fisher arrives at an area and finds a boat already in the space, they will move to another spot or at least put some distance between themselves and the other boat. When asked, fishers explained that the first to arrive in a spot has priority over that area, regardless of where they are from, how often they fish there, or any other criteria including fish aggregation. This occurred on several fishing trips in different habitats. Mangrove fishers would avoid bays where a boat was already situated, and on one occasion the fisher I accompanied opted for an area he reckoned would be less productive (because of the water level) rather than share a bay with another fisher. Accompanying a group of early morning net fishers, we returned to a spot where we had fished a few days previously to find another boat and two men laying out nets. Although the shore was large, several kilometers long, we chose to move down the shore until the boat was out of sight. When asked about the practice in interviews, one fisher answered that it was no problem (*tidak masala)* to join fishers who have already claimed a spot; a second also told me you *can* join other fishers, but you risk upsetting them. I interpret this as suggesting that while there is no *rule* that says you cannot join another fisher, it still avoided.

Self-Spacing

In these instances where a fisher arrives at a preferred spot to find another boat, whether that fisher is from his village or not, there is a practice of self-spacing. Fishers leave

a comfortable distance between themselves and other fishers which is dependent on the context and situation. In an area where several boats are visible, none are close enough to speak to one another. Spacing is not a function of gear type; there is no reason why two groups of net fishers could not be within 500 meters of each other, and divers and line fishers could easily work in proximity without disturbing each other. Yet boats are usually no more than a small speck at a distance, if visible at all. Self-spacing was observed on every trip to sea, while traveling between islands and while fishing. While diving near the island of Sikandang, three boats were visible on the horizon but we never encountered another fisher through the entire day. On every occasion, there was no direct discussion or verbal negotiation of space. Fishers found a comfortable, regular distance tacitly, with no reference to rules, only custom.

Avoiding Repetition of Fishing Spaces

Fishers in all areas seem careful not to get too close, although there are no articulated criteria for those limits. They also do not appear to duplicate fishing efforts in the same space in a single day. On a mangrove trip, the fisher I accompanied arrived in a familiar area to find a friend fishing the same small bay. He asked the other man which areas he had already fished and which direction he was moving around the bay, and ensured that we did not overlap areas. When asked why, he replied the fish in those areas had already left (*sudah lari*) and it wouldn't be good for us. On a diving trip, the captain kept careful watch of a boat that was line fishing between us and the shore. Even after the boat left, we did not approach the space it had occupied; we moved towards it, then pulled back and moved on after a point. While net fishing with another group of fishers, we could observe another boat at a distance pulling in their nets heavy with fish. In spite of the fact that we had not been successful that day, we did not move the boat to the same area when they left. Perhaps it could be assumed they had fished out the area; still, there is no rule to prevent fishers from attempting to try a proven productive spot. They avoid it as a practice, not as a rule.

Specialization of Fishing in Pulau Banyak

Haloban is unique in Pulau Banyak for its exclusive use of *perahu* for fishing. While these small boats are used by the two other large villages, they represent a much smaller

percentage of fishing effort. The two larger villages, Pulau Balai and Ujung Sialit both employ larger boats with larger crews. Two types of boats in particular make up much of their fleets: *bagan* boats have bright lights for night fishing and target a tiny anchovy-like fish similar to *Stolephorus commercionnii* called *teri* in Indonesian (*ow-ow in Haloban)*; and a second *kapal* with wide stabilizers to withstand large waves for deeper ocean fishing. The second boat is used outside of the reef areas in the deeper waters off of Bangkaru to catch squid and pelagic fish with gill nets, and also for compressor diving for lobster and sea cucumbers. Both types of boats are 3-4 times the size of a *perahu* and employ several men. With these larger boats, fishers from other villages are targeting different species and utilizing different spaces within the islands.

This specialization between villages may not purely be a function of equipment, however. Compressor divers from other villages are known to make sea cucumber their target species, to be sold for export. While Haloban fishers were observed identifying and even handling valuable sea cucumbers during dives on several occasions, they were never seen taking these species. On only one occasion a Haloban fisher was observed at the fish dock with four sea cucumbers in his boat; he sold his fish catch but took the sea cucumbers home.

CONCLUSION

Fishing in Haloban is a dynamic relationship with the environment. Fishermen are adaptive and opportunistic, making instantaneous decisions based on observation and experiential knowledge. While there are articulated formal and informal institutions for fishing, they are not necessarily enacted and many behaviors are more tacit, habituated understandings of the socio-environment. These situated practices are seen across all types of artisanal fishing in reefs and mangroves and driven by the changing contexts and experiences. Some of these practices may be seen as simply avoiding conflict—first come privileges and self-spacing in particular. That may be the motivation, but how that manifests in the routine behaviors of fishers is situational and implicit. The practices that avoid repetition of fishing spots cannot be categorized as conflict-avoidance, and do not follow any explicit law. There are no rules for directing these practices, and there could not be since the context is so dynamic. How practices affect sustainability issues is unclear. However, they

are still critical to understand fishers' active engagement with their natural environment, and may offer potential for informing locally-legible management policies.

CHAPTER 5

DISTURBANCE: TSUNAMIS, TOURISTS, AND CHANGE

Change and movement are mundane features of Haloban's seascape that contribute to its diversity. Fish, turtles, and other species migrate in and out of the area's lagoons, mangroves shoot up where homes once stood, currents and swells fluctuate. Socially there is also change: migration, temporary or permanent, seems to have been a continuous feature of the community, negating any characterizations as an isolated, homogenous group. However, there are recent events and processes of change that are greatly shifting the social and ecological environments and their resilience. The two disasters of 2004 and 2005, tourism, and education pressures are presenting opportunities and challenges to the commons and the Haloban community. These disturbances have important consequences for how fishers and their practices as they shift the context of the commons.

TSUNAMIS AND EARTHQUAKE OF 2004 AND 2005

> The first tsunami was in the morning. There was an earthquake, but things seemed fine until the water receded (turun), exposing coral "rocks" (batu) far out. People knew something was wrong, and then, they could see water approaching fast. Everyone ran for the mountains, stayed there one or two nights. When we returned, homes were filled with water but still standing. The second time, three months later, the earthquake hit at night. Everyone left, heading for the mountains, some with little clothing on- no pants, no shirts (laughs). When we returned again, homes were destroyed (hancur) along with everything we owned.
>
> —Unpublished interview with a woman and her two sisters
> October 1, 2011

On December 26, 2004 at 7:58 am, a magnitude 9.1 earthquake shook the Sumatra-Andaman trench about 200 km northwest of Pulau Banyak. The tsunami wave that followed brought inconceivable devastation to people living in Aceh and throughout the region. In Haloban, the earthquake was not felt, but people near the shore noticed the strange behavior of the water. A few people sounded the alarm, shouting as they ran up the street, heading into the steep jungle past the edge of the village. Residents fled as homes near the shore,

particularly the neighborhood of Pondok Garam, were flooded and damaged, as were several boats. Still, compared to other areas of Aceh, Haloban was not heavily damaged and no lives were lost.

Then, on March 28, 2005, an 8.7 earthquake struck in the night, the epicenter of which was less than 20 km from Pulau Banyak. This time, residents felt the quake, which damaged buildings. When the warning was shouted that the water was quickly receding, people again ran for high ground. This time the tsunami wave struck harder and higher. One fisher was at sea, and had a fantastic day catching tons of fish. He had no idea about the quake until he came home to find his house destroyed and wife and children missing. He cried, but later that day found they were alive and well, having escaped to the mountains. Many people stayed in the jungle for weeks this time, frightened to return home. While this second earthquake was centered just kilometers from Haloban, it is commonly known as the Nias earthquake. Over 2,000 people lost their lives in Nias and Simeulue, and the physical landscape was ravaged throughout the islands (Nalbant et al. 2005).

The biophysical environment of Haloban was severely altered by the tsunami in several ways, according to residents: beaches have changed, coral is deeper and mangroves decimated. Some coral apparently died after the tsunami, presumably from the force of the waves or shifts in water level. Aceh coral was also affected by a bleaching event in June 2005, further exacerbating the damage and restricting recovery. This is resulted in the loss of fish stocks and diversity, as some fishers explained, as fish have lost their homes and moved. However, a few fishers acknowledge these changes began well before the tsunami, due to bomb fishing and cyanide poisoning. Some areas were perhaps already too damaged to be resilient to the tsunami's affects.

The tsunami also changed the social environment of Haloban: not only were neighborhoods altered physically, but livelihoods and household priorities shifted as well. While the entire Haloban community has been affected, sub-groups and individuals have varying experiences. The village of Haloban, particularly the neighborhood known as Pondok Garam, and the Asantola neighborhood of Inpres, were physically devastated by the tsunamis and are now mostly uninhabited areas. Pondok Garam and Inpres lay on opposite sides of the mouth of the river where a bridge connected them at one time. Today, the dozens of homes that stood there are skeletons and the bridge and connecting roads

completely wiped out. Mangroves have started to retake the space. In total 52 households surveyed-- more than half-- reported damage or loss of their homes in the earthquake and tsunami (Figure 4). Infrastructure was also ruined, including docks and a bridge that once linked Inpres and Haloban. The devastation of dozens of homes forced residents to move, staying temporarily with other family members until new housing could be built. The Indonesian government and international organizations arrived with assistance, providing food relief, medical care, and constructing new housing. Housing was constructed well away from the shore, separating neighbors and reconstituting relationships. Indonesian government and international organizations arrived with assistance, providing food relief, medical care, and constructing new housing (Figure 5).

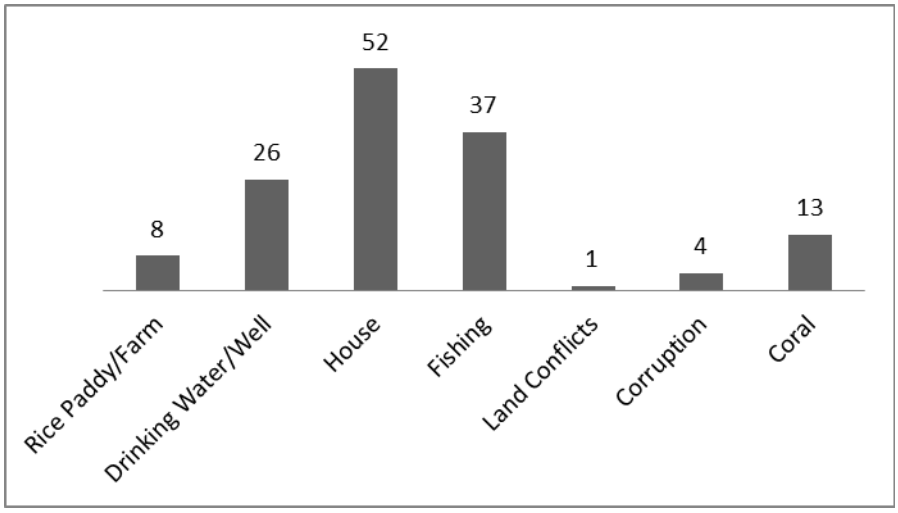

Figure 4. Perceptions of negative tsunami/earthquake impacts, n= 74.

Fishers' livelihoods were also hit hard: 39 households reported their boats were destroyed in the tsunami. Some evaluated to have the greatest need were gifted with new boats, engines, and nets by a Swiss NGO and the Indonesian government. These boats were not made locally, but purchased from a factory in Aceh and brought here. This distribution of boats took place across Aceh, with noted disparity between rural islanders like Haloban and more urban mainland populations (Tewfik et al. 2008), further marginalizing some of the poorest fishers. Today, many fishers' households also maintain rice paddies and earn income with labor employment in an attempt to diversify their economic base.

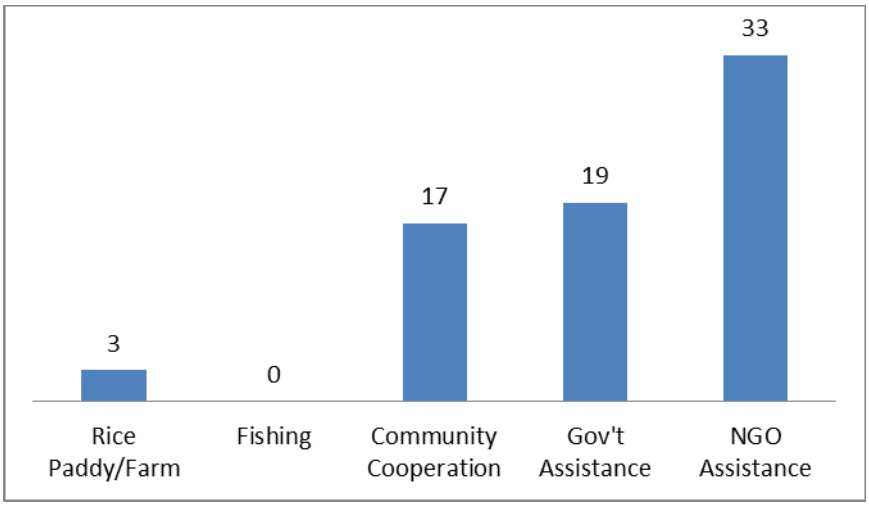

Figure 5. Perceptions of positive of tsunami/earthquake impacts, n= 52.

It should be remembered that the earthquake and tsunamis occurred over seven years ago, yet it was a frequent point of reference when discussing many aspects of daily life today. These events still resonate in how people relate socially: who their neighbors are, what they do for a living, what their expectations are for their children. The tsunamis were also in part a catalyst for two other disturbances in the social and political environment: tourism and education.

TSUNAMI RELIEF AND ALTERNATIVE LIVELIHOODS

In Haloban, as in other Acehnese communities, the tsunamis brought a greater presence of government and international organizations in the form of relief efforts, but also the possibility for greater marginalization of this rural community (Tewfik et al. 2008). Fishers were treated as a homogenous group, so boats, engines, and nets were distributed to about twenty-five families based on their evaluated need and vulnerability without regard for their personal fishing knowledge or experience. Outside agencies with funding from the World Bank, the Indonesian government, foreign investors and NGO's determined the best locations for housing and infrastructure development and hired skilled workers from outside the community to build and manage projects. Not all were successful: an ice factory sits dormant and overgrown with weeds today, and even much of the housing is empty. Tourism had been a small source of income in the past in Pulau Banyak, but the number of visitors

declined greatly during the GAM conflict and following the tsunami. An NGO-sponsored plan was enacted to build tourism infrastructure, create an English-only website for tourism information, targeting foreigners, and train local residents in the tourism industry.

Physical infrastructure for tourism came first in the form of lodging. Beachfront bungalows were built on two small islands, Tailana and Matahari, both owned by families from Balai. Although the NGO made efforts to form a cooperative so profits would be shared among several families, the eventually ownership of the bungalows was concentrated with the families with claims to the islands. Informants say cooperative members lost interest in maintaining bungalows that were distant from home and sporadically occupied, and sold their shares to the island's owners. The Tailana bungalows do have a steady occupancy of a few couples each week; however, they directly contribute little to the Haloban economy. One family in Haloban owns bungalows on another island, which they built and operate independently with occasional visitors.

ENCOUNTERS WITH TOURISM

While backpackers do occasionally make their way to the village, most encounters between Haloban community members and tourist occur where fishers and surfers find common waters. During my 11 weeks, a total of four tourists stayed in the village, most for a single night. Most visitors stay on Australian live-aboard tour boats or in bungalows on islands outside the villages. Currently, another infrastructure project sponsored by Islamic Relief is underway to build a cement dock for tour boats. This dock will be too high for artisanal fishers to utilize, but the hope was that it could accommodate the live-aboard vessels and inspire more visits to the village[6]. (Tourist boats are not taxed or compelled to register when visiting Bangkaru or other islands, so there is no compensation for the community.)

Because of this spatial divide, it is primarily fishers who encounter the tourists while they are fishing the reefs. Fishers who dive for lobster near Bangkaru and at the southern tip of Tuangku at Ujang Lolok report seeing surfers who arrive by Australian *kapal sewa* (live

[6]As the project neared completion in October 2011, political conflicts between Islamic Relief and their local partners caused the project leaders to leave. It is unknown if the dock was completed.

aboards) every week. Coral fishers encounter tourists in the reef areas primarily at Tailana, if they pass close to the beach. Occasionally visitors hire a passing fishing boat to take them from Tailana to Haloban for a few hours to buy food supplies, or to island hop. Fishers told me they might receive the equivalent of four days fishing for a few hours of driving their boat between islands. While heading to the mangroves to fish, I observed a local boat carrying a group of foreign tourists between islands.

In Haloban and other communities, men were trained as guides for jungle trekking and kayaking in 2008. The website designed by partners of YPB provides information in English only on sites throughout Aceh, with a few pages dedicated to Pulau Banyak which direct tourists to YPB for assistance and specifically for arranging visits to Bangkaru. When tourists do hire a guide, the payment is substantial: the price for 2 days kayaking/1 night camping on an island, which pays for the kayak rental from the NGO and their fee, plus the supplies and guide's fee, is 10 times what a fisher earns from diving for octopus in a day.

EDUCATION: "MAU ANAK MENJADI SUKSES: I WANT MY CHILD TO BECOME SUCCESSFUL"

Fishers express a desire to provide for their children, and it is a constant concern. Having income to pay for a child's education is a particular worry for parents; schooling through middle school (SMP) is free, compulsory, and local. However, for high school and beyond, children must be sent to live outside the village, with additional costs for tuition and living expenses. Nearly half attend high school in Aceh Singkil (Table 3), the port town on Sumatra's coast closest to the islands, but many also travel to Banda Aceh, Medan, and Simeulue, sometimes staying with extended family though many pay for boarding as well as school fees. Costs range upwards of 3 million IRP per semester (about $325 USD).

Table 3. Current Cities of Residence for Post-Primary Students, n=38

Simeulue	Sibolga	Medan	Padang	Madina	Banda Aceh	Subulussalam	Rimo	Singkil	**Total**
3	1	1	3	1	6	2	2	19	38

While it is a financial hardship, post-primary education is on the rise and becoming an accepted responsibility of parents. Some recognize it as a new expense, increasing the

cost of living as compared with the past, but they were nonetheless eager for their children to attend school. With obligations to support an orphaned nephew attending culinary school in Banda Aceh, an adult daughter studying midwifery in Aceh Singkil, a second daughter in her last year of high school and the youngest daughter in her last year of middle school, the family I stayed with frequently prioritized school fees over buying food or other basic household needs. It is a recent and dramatic shift: nearly all adults over the age of 35 attended only primary school (which is available in the village) or had no formal education, with only the school teachers holding post-primary degrees. In contrast, over 1/3 of residents between the ages of 15-24 are attending or have attended high school or college (Figure 6). These numbers are consistent across gender and ethnicity, representing a community trend towards higher education. It is difficult to correlate this trend directly with the tsunami, but the dramatic jump in education in one generation does suggest a radical shift in the community's values and coping strategies.

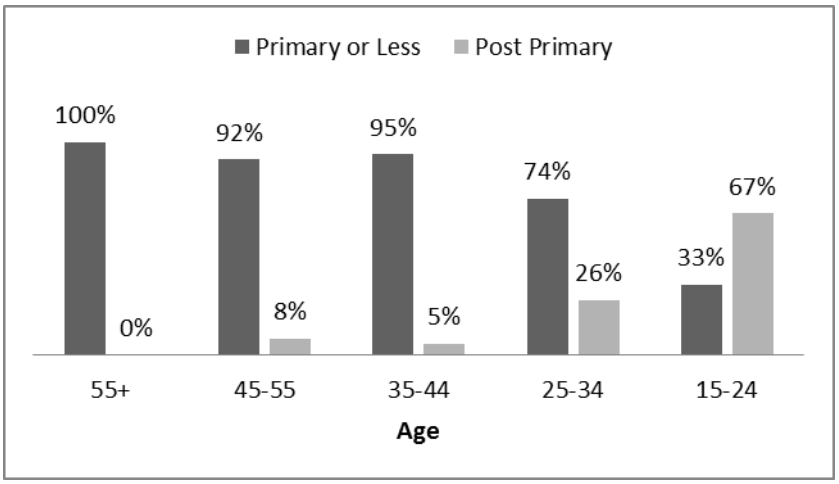

Figure 6. Education levels by age group: primary (up to SMP) or post primary (SMA or SMK and beyond).

The strategies to meet that expense are diverse. Many gardeners report planting *karet* (rubber plant) as an investment for the future to pay for school. Women raise money to contribute as well; I interviewed one woman as she and her preteen daughter shaved cassava root into chips to be fried and sold to contribute to the school fund. The girl was finishing middle school (SMP) this year and hoped to attend high school (SMA) in Singkil. Fishers must also consider this in their fishing practice. Some fishers report targeting species for sale

rather than sustenance, because the cash is more useful. "I can sell fish and buy eggs, and I have cash" (Informal Interview). This is a pressure that may increase the shift from subsistence to commercial fishing choices. The reasons for this emphasis on education are undoubtedly multifaceted; however, it is clear that most parents do not want their children to grow up to fish. 86% of survey respondents indicated they do not want their children to fish (Figure 7), many emphatically. "Janganlah! Jangan ikut orang tua" [Don't! Don't follow your parents]. Without being asked, thirteen respondents elaborated that they wanted their children to go to school, rather than fish or farm. "Kalau ada uang, mau sekolah" [If there is money, I want them to go to school].

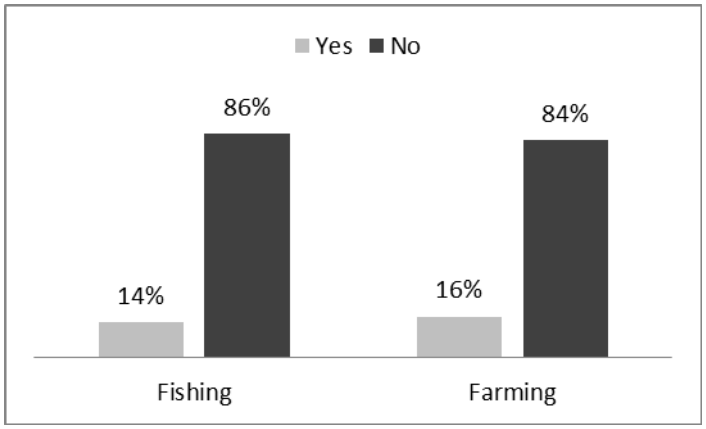

Figure 7. Do you want your children to fish or farm?

CONCLUSION

Different families and segments of Haloban's society continue to be affected in different ways by the earthquake and tsunami, as well as the resulting relief efforts, tourism, and focus on education. While the disasters were single events, their presence remains in both the biophysical and social spheres that fishers and their families are negotiating each day. The loss of a boat or home seven years ago could substantially change the opportunities and priorities of households and sub-groups, and the gift of an engine by an NGO could dramatically alter fishing practices. These adjustments are not universal, and the implications of change not well represented by static or cumulative statistics. There are also informal social institutions and networks outside of resource use that can have profound implications,

as partnerships that arise between neighboring women or football team mates can inform resource use practices (Agrawal 2000).

Disturbances in the ecological and social spheres are also regular and important for creating new adaptations (Botkin 1990). Disaster discourse has been critiqued by anthropologists for viewing communities as bounded, ahistorical entities, unable to cope with change without help from outside (Jentoft et al. 1998; Waddell 2008). This seems to echo those colonial views that non-western people "need special forms of surveillance and supervision" and are "unable to participate fully" that once hobbled development and conservation (Rapley 2007). New ecology theorists provide a more flexible, nonequilibrium framework that considers environmental history and complexity (Botkin 1990; Scoones 1999), which is more fitting for real-world application, particularly when disaster is an accepted phenomenon. Indeed, "by emphasizing adjustment, adaptation and perception, the study of natural disasters draws attention to the dynamic relationship between humanity and environment" (Alexander 2007:223), taking us right back to that requirement of understanding coupled social and ecological systems (Liu et al. 2007) to create realistic methods for sustainability.

CHAPTER 6

DISCUSSION

This chapter explores a few questions presented by this case study, particularly the unarticulated practices, *adat* traditions, and management structures encountered in the Haloban commons. Some of the fishing practices described may be interpreted as informal institutions or *adat* customs of resource use. Since these concepts are somewhat varied in the literature there is room for discussion; but I argue that western concepts of institutions and customs are unsuitable for understanding the situated and unarticulated character of these practices. This approach is particularly important for resource management schemes, which use the more direct and distinct characterizations of institutions established in new-institutional literature. For this study, I am drawing on political ecology perspectives and some of the critiques of *adat* descriptions in an effort to present a less essentialized, more experiential representation of Haloban's commons.

UNARTICULATED PRACTICES AND REGULARIZED USE

I have described some of the fishing practices witnessed as unarticulated, and while the subject requires further research, this representation is dependent on both my interpretation of institutions and emic characterizations of the practices as unregulated. New-institutionalists use game theory to define institutions as the "rules of the game" (North 1990:3), providing predictability and limits for individual actors to make decisions. Although institutions are usually thought of as formal governance, many "rules of the game" are informal, "created, communicated, and enforced outside of officially sanctioned channels" (Helmke and Levitsky 2004:725). Some researchers include uncodified social mores such as norms, values, and traditions in the category of informal institutions (Bardhan and Ray 2008; Glaser et al. 2010; McCay 2002). Some have also tried to present institutions as embedded in practice and coordinated with traditional ecological knowledge (Knudsen 2008), or as the "regularized patterns of behavior between individuals and groups" that mediate environment-society relationships (Leach et al. 1999). I began my research from

this theoretical perspective, but in the field I encountered challenges to some of its basic elements, particularly the issue of rules as recognizable and enforceable.

In Haloban, I asked many fishers and community leaders about the rules for fishing, and came up with a very short list. The national and provincial laws are straightforward: coral harvesting and bomb and potassium cyanide fishing are illegal, with posted fines and possible jail time as consequences of being caught. Fishing near the turtle nesting beach and egg taking on Pulau Bangkaru is also legally restricted, though the only enforcement is by the YPB staff patrols that have no punitive authority. At the district level (*kecamatan*), anyone who is not a resident of Pulau Banyak or Pulau Banyak Barat must report to the *kecamatan's* office before fishing, and their boat must not draft so deep as to potentially harm shallow coral areas. This physical impediment is perhaps the most important access restriction for these commons. In one Pulau Banyak community there is a fishing cooperative to regulate pricing and fishing activities. In Haloban, there is no such cooperative; instead, there is a traditional Acehnese leadership position of *Panglima Laot* who is voted by his peers to the position. Though he has little capacity for enforcing the rules, he is vested with the authority to punish fishermen who violate the religious requirement to abstain from fishing on Fridays.

The practices I describe in this study do not appear to be regulated by any of these formal institutions: legal, traditional, or cooperative. Though some of these behaviors are self-limiting and may contribute to reduced maximization of resource extraction, there are no expressed rules, forms of dispute settlement, or punitive consequences that fisher invoke to explain their behavior. This is in clear contrast with land use, for which there are multiple *adat* regulations and legal statues. Informants explained there was no ownership or rights at sea that could be enforced. So why then do they avoid repetition, allow ample space between fishers, and the other observed regularized behaviors?

When first interviewing fishers and the *Panglima Laot* in Haloban, these practices were never mentioned. I asked several people to explain fishing organizations (*organisasi*, *koperasi*, *bekerjasama*), rules (*hukum*), and traditions (*tradisi,adat*) using a variety of language choices. I asked if there were places, times, days, seasons, or species that were ever forbidden. It was at times challenging to communicate about this subject in the abstract, but the answers from multiple sources were consistent: there was no association or organization for fishers, and the only community rule identified was a prohibition on fishing on Fridays.

Second, when the practices were occurring, fishers had varying explanations for their behavior that often came back to being polite and moral, never because of a rule. Unfortunately I did not ask fishers how they themselves characterized a rule, but the responses were definitely more personal and situational than related to governance. This is similar to Knudsen's (1995) findings among Turkish fishers; however, whereas Knudsen considers these to be "informal rules" embedded in society, from my perspective these behaviors defy the definition of a rule as somehow articulated or enforceable. No one ever answered that they might get into trouble with leadership or even other family members, only that the other fisher in that context who would be upset (*sakit hati*). Finally, it is notable that these practices occur even when fisher do not know each other and do not come from the same village. It also did not matter if the other fisher was from the same community or a different one, suggesting that these practices emerge from the ongoing, collective engagement with the environment, and not related to their community membership or other group identities.

The abstract, cognitive roots of institutions do not really account for these "habituated and regularized 'rules-in-use' maintained by human practice" (Watts 2000:40). In *Seeing Like A State*, Scott chronicles the development of abstracted, simplified systems for measuring and cooking down the raw, inconsistent, dynamic reality of life to provide states with a framework with which to govern (Scott 1998). While this decontextualization is apparently necessary for managing a large body of people and space, it is always inherently at odds with the diverse, interwoven reality it is meant to represent. Situated action and "contextualized constructions" that are part of a tacit, direct engagement with the world just are not satisfactorily captured by abstract frameworks (Pálsson 1998).

ADAT AND TRADITIONS

If these practices are not reflective of institutions and rules, could they still be an expression of *adat* or tradition? This is another challenge, because *adat*, particularly in this region, has been documented to be highly adaptive and situational (Rodgers Siregar 1981), and *adat* institutions can be molded to provide a space for negotiation between state regulations and community needs (Acciaioli 2001). Haloban is ethnically heterogeneous, meaning that local *adat* practices are incorporative of many traditions of both Aceh and West

Sumatra, plus the influence of Islam. The *Panglima Laot* is an Acehnese station, as is the *Kepala Mukim*, or traditional community leader (known in other Indonesian regions as the *Kepala Adat).* Acehnese adat systems of land and property are also employed in Haloban, including *mawah*, *gala*, and *sayam* (see Chapter 3). These systems are at the very least better characterized as a "moral economy" (Scott 1976) than the "rational economy" model frequently employed by new-institutionalists. *Gala* and *sayam* seem suitable for addressing disputes at sea as much as on land; however, the *Kepala Mukim* and *Panglima Laot* both told me they do not handle maritime conflicts, and in fact did not even recall any such dispute happening.

This absence of regulation or dispute management seems to indicate that fishers are not employing practices based on these *adat* rules, or any sense that they might be held accountable in the community for violating an accepted, even informal, norm. While Knudsen (1995) sees his fishers' practices as "legitimized by tradition", in this case, tradition seems just as emergent as practice. In fact, researchers of Batak societies in Sumatra (an ethnic identity claimed by many Haloban residents) have noted the highly innovative and context-specific character of *adat* (Andaya 2002): "the Batak peoples of North Sumatra have an almost alchemic knack for reshaping their traditional cultural patterns" (Rodgers Siregar 1979:103). Changes to *adat* are not only influenced by the external pressures of nationalism and Islam, they have also been relative to internal relationships and situations as well. The traditions a group invoke are less related to abstracted labels of lineage and ethnicity than their immediate community and setting (Rodgers Siregar 1981). Traditions therefore may be characterized as emergent social properties similar to practice, but that distinction undoubtedly requires further research and debate.

GOVERNANCE AND RESOURCE MANAGEMENT AT SEA

Much of the interest in *adat*, tradition, and customary tenure for natural resources across Indonesia has sprung from the new-institutional focus on governance, and using existing institutions to regulate the commons. Centralized, "top-down" strategies for managing resources have proven incomplete; while broad policies for international cooperation are sometimes useful, when considering specific and unique settings for sustainability projects, it is often too clunky and slow to adjust to a dynamic local context

(Jentoft et al. 1998). Vast, unwieldy seascapes where coastal human communities are directly engaging with their environment have been a significant challenge to centralized control (Pollnac and Pomeroy 2005; Salafsky et al. 2001). Particularly in Asia-Pacific, resource management practitioners have therefore turned to decentralized and context-specific approaches, known as adaptive and integrated management (Acheson 2006; IUCN 2008; Siry 2006), or community-based natural resource management (CBNRM). Drawing on "traditional" indigenous management approaches, this is envisioned to be a locally relevant, "ground-up" foundation for resource management and decision making that empowers the people closest to a sustainable management project area to be more active and invested in outcomes (Pomeroy and Berkes 1997). Ideally, this approach unifies the priorities of biodiversity conservation, poverty reduction, and indigenous knowledge recognition (Agrawal 2001), while sharing management power and responsibility, rather than passive participation, by the people most directly related to the environment (Armitage 2003; Berkes and Colding 2000) and acknowledging the rights of local people to decision making power (Ferse et al. 2010; Li 2000).

Ostrom's key message to policy makers has been that they should not assume that "local rules and customs were lacking for most common-pool resource systems", particularly in developing countries (Ostrom 1992:313). This perspective has also been advocated by anthropologists in marine settings who emphasize the need to recognize the presence and value of indigenous traditions of resource management (Colding and Folke 2001). Berkes demonstrates that creating new institutions without consulting local customs and rules can be dangerous, because as in his case study, the state's rules can "*undermine local rules to limit access and to regulate behavior*" (Berkes 1992:177, original italics), suggesting that local practices should be the center of common-pool resource discussion. Yet somehow, attention to what people actually do and their unique adaptations in different and changing circumstances has been lost to a systems focus. When suggesting topics for developing new methods for addressing the commons, CPR researchers suggest more data is needed to generalize global patterns (Dolšak and Ostrom 2003). This concentration on broad, comprehensive characteristics of institutions may be a liability in furthering the cause of sustainable, adaptable, locally-relevant resource management.

The emphasis on institutions of governance and resource control may be a modernist weakness however (Pálsson 1998; Scott 1998). If governance is viewed as the policies and mechanisms of controlling the commons, management may be the more adaptive process that allows for negotiating specific situations. The emphasis on governance submerges the act of engagement as embedded, situated practice, which offers a more locally-relatable and relevant approach for management (Jentoft et al. 1998). Seeking processes of management and sustainability, rather than outcomes of governance and policies, may provide a more locally adaptive framework. Returning our gaze to those local practices and customs, and embracing their situated, embedded character may improve our management approach (Crate and Nutall 2009; Ferse et al. 2010): "emergent properties, reciprocal effects, nonlinearity, and surprises should be routinely taken into account in planning and management practices" (Liu et al. 2007:644)**.**

CONTESTED SEASCAPES

Haloban's commons are in a process of political and practical transformation that may affect the unarticulated practices described in this thesis. The lasting degradation and distortion created by the tsunami events on ecological systems has diminished the productivity of the commons for fishers. At the same time, the social and political contexts of the commons have greatly shifted: new districts have been created, and tourists have introduced new uses and derived new meaning from the environment. As the reefs and islands of the fishing commons are repurposed and experienced in this context, situated practices may be changing or disappearing—for the benefit or detriment of both people and their environment.

Whereas a year ago the entire area of Pulau Banyak was under a single district, there are now two districts using "the processes of mapping, bounding, containing, and controlling nature and citizenry" to bring themselves into being (Neumann 2004). When I visited the Pak Camat's office, he delighted in articulating the name of every island in the new Kecamatan's area, spending a half hour telling me the names to write down and reviewing them together to make sure none had been forgotten. The westernmost island of Bangkaru falls into this new district. Designated a "Taman Wisata Alam" (Nature Park) by the Governor of Aceh in 1996, is under the authority of the Ministry of Forestry (KSDA), and its

designation limits legal access for research, tourism, and cultural activities while prohibiting resource extraction. Since 2007, Yayasan Pulau Banyak has patrolled the beaches of Bangkaru, to collect data on turtle nesting, including tagging and recording behavior, as well as to patrol the rookery beach and discourage egg taking. Tourism on Bangkaru is increasing in two forms: first, YPB allows for volunteers and visitors to stay at their research station for a significant fee, which is used for operational costs; live-aboard boats primarily from Australia also shuttle surfers to the beaches to experience the superb waves.

Of course, these opportunities for economic gain and power are a source of conflict. However, these activities also represent a new kind of engagement with the environment that is creating a different kind of seascape, one that perhaps has a different meaning from the fishing commons. When I first visited Pulau Banyak, I was interested in a disagreement about the number of islands in the area. Officials claimed there were about 70, but locals have said for years that there are 99 islands in Pulau Banyak. Urban Indonesians told me that people here were just "ignorant", but it seemed unlikely that locals who use the islands daily would not know their own environment intimately. During this trip, I found that local people actually counted islands differently than the state, sometimes calling stands of mangroves an island when they would not be characterized that way by geographers.

The existence of different views of the environment is not surprising, but it seems in Haloban there is an increasingly abstract conceptualization of their islands and reefs that is more reflective of how outsiders see their environment. I was asked a few times if a particular beach or spot would be attractive for tourists. Meaning is being found in the environment through the eyes of NGOs and state and tourists, and value is expressed in an area's attractiveness for use by these entities, rather than in terms of fishing.

There was one occasion where I noticed what might be the absence of those unarticulated practices described above, in the presence of tourists. On one Saturday fishing trip, I accompanied a few men (two fishers and a school teacher) for trolling. We headed to the nearby island of Tailana, which boasts some of the most vibrant coral in the area and is also the home of regularly occupied tourist bungalows. We beached our boat and brought out a net to collect the small *tamban* fish to use as live bait. There were tourists present who watched us from a distance, but there were also other fishing boats nearby and we spent a little time socializing. It was the closest I had ever seen fishers come to each other, and at

first I considered the anomaly to be because we were on the island's beach, which maybe made it exempt from the practices of the fishing commons.

However, rather than being determined by space, I believe the commons here are determined by use: where tourism is the prevalent activity, meaning is altered and therefore practice is also changed. Meanings are "gathered" from the seascape… "not so much constructed as discovered" (Ingold 2000: 22) with experience. When use changes, meaning is also gathered differently. As tourism introduces new use and new practices emerge, more research on the "reciprocal interaction between practice and meaning" (Peters 1987:193) is needed to examine how these interactions may help or hinder resilience.

CONCLUSION

Each of the topics for this discussion section require additional attention in research and are not adequately addressed here. These are introductions to larger complexities that are often peripheral to discussions of the commons, yet have import into their creation and operation. A more reflective eye on our assumptions of meaning, governance, and management can help us to shed the biases that create tragedies of the commons more than they solve them. The greater issue through all of this is how the goal of sustainability is best served through a united perspective of action and knowledge, and a coupled social and ecological environment.

CHAPTER 7

CONCLUSION

This case study is intended to represent fishing as a lived experience of members of the Haloban community, demonstrating the indivisibility of a coupled social and biophysical environment, and bringing attention the embeddedness of the commons in historical, political, and social processes. Haloban fishers and gleaners extract resources from their environment for both subsistence and income, using a variety of means. Practices emerge as individuals and groups employ diverse skills, knowledge, and technology—often in unarticulated, tacit ways that are expressed in use and action.

Given the variability and unpredictability of marine environments and social diversity of coastal fisheries like this case, including practical knowledge and action in management schemes is demonstrably valuable. This intimate view of local processes and practices is achieved by employing an ethnographic methodology that includes the "wider community" (Pálsson 1994) of fishers. While Haloban's coupled social and ecological environments are developed from a unique history, social diversity, and biophysical environment, the chosen theoretical framework of practice may be applicable and useful in other commons scenarios.

HALOBAN'S ARTISANAL FISHERS AND THEIR PRACTICES

Fishers in Haloban are considered "traditional" (by themselves as well as outsiders), primarily because they use low-tech gear and are not fishing commercially. Their narrow *perahu* use low-horsepower engines to take them between the islands and through shallow lagoons to fish. Their practices are opportunistic and adaptive to unpredictable situations—migrating species, shifting currents, fluctuating prices, fall school fees for their children. Fishers bring multiple gear types and may shift their method from line fishing to diving, from targeting octopus to reef grouper depending on their assessment of the moment and their needs. While the Panglima Laot here is expected to represent fishers' interests to Banda Aceh, his role as a mediator and enforcer is minimal. Rather than employ a formal system of regulation, unarticulated practices emerge as fishers engage in their seascape's social and

ecological context. These practices of self-spacing, first-come rights, non-repetition and community specialization are not a form of management, but any management form that is developed will be more successful in it considers how fishers are engaging with the environment.

Haloban fishers who participated in this study express their concerns for the environment, as well as their optimism for adaptability. They feel their resources have decreased and pressures for income have increased. While they shift and diversify their economic activities, the process involves institutions as well as their situated practices for fishing. The context for those practices have been deeply affected by disturbances in the social and ecological spheres. The tsunami events of 2004 and 2005 have perhaps permanently changed the biological processes of Haloban's fisheries. They have also changed the social processes, creating trauma and augmenting vulnerability while simultaneously introducing new political and economic influences. Tourism has been touted by development agencies as promising alternative livelihood, yet its introduction has both ignored and changed the current uses and meaning of the natural environment. These discrepancies signal the need for greater attention to local views in both development and conservation plans.

ETHNOGRAPHY AND CONSERVATION

With this study, I also hope to demonstrate the value of ethnographic data for natural resource management and conservation plans. Quantitative approaches are privileged in conservation discourse, for two reasons: one, it is legible and valued by the biological sciences community; two, it is more practical for policy makers to work with broad, representative data. Unfortunately, this lends itself to simplistic, homogenous portrayal of a complex social world, and obscures the political side of conservation (Eder 2005; Fabinyi et al. 2010; Watts 2000). Oversimplified representations of social processes can be self-defeating in sustainability efforts, when fishers are seen as a single group or non-fishers excluded from resource-use discussions (Fabinyi et al 2010; Walker et al. 2002).

Anthropologists have been critical of conservation and environmental management strategies offering two-dimensional portrayals of community (Agrawal and Gibson 1999; Brooks 2010; Elliott et al. 2001), considering it detrimental to authentic community-based

efforts. Some NGOs have been critiqued for wanting data, "not rapport" or partnership with the community (Peterson et al. 2010:11), and for not paying enough attention to what local people actually have to say (Austin and Eder 2007). Blueprints for conservation provide detailed examples of best practices in biological surveys and assessments, but do not offer much guidance on social assessments, only briefly emphasizing that they matter without offering methodological tools (IUCN 2008).

Ethnographic studies, which emphasize qualitative, long-term research methods have been shown to bring value to sustainability and conservation approaches, particularly with artisanal fishers (Fabinyi et al 2010). Not only because it can reveal some of the "fine grains" of life in a community, deepening understanding of social processes, but it also allows for an emic (local) perspective. If community-based approaches are going to be more than nominally inclusive of the whole community, better representations of internal diversity, historical development, and political processes are needed.

LIMITS OF STUDY AND FUTURE RESEARCH

Like most studies, this project had many limitations, particularly time, capacity, and focus. A few months provides a small window into local complexity, but there are many areas that this ethnography could not adequately address. Most fishing practices were directly experienced and observed, but no trips were made with fishers outside of the reef areas to observe deep-water diving or night fishing. While poisoning is described by many, it was not directly observed or explained by a practitioner due to its illegality. With more time and rapport, perhaps a study could investigate how and why this destructive practice is used and tolerated.

The political sphere was cursorily addressed here, and the intriguing power relations occurring here between the NGO, local government, province and state agencies would be an excellent subject for further study, particularly in relation to the tourism industry and the international conservation and development communities. It would also be interesting to ask community members why education is such a priority, why fishers don't want their kids to fish, and how that might add social stratification to the community in the future. This is the first known study of Haloban's unique community, and it is certainly worthy of further attention for linguistic, anthropological, and ecological study.

APPLICATIONS FOR THE HALOBAN COMMONS

In this case study, I have endeavored to describe the complex socio-environment that fishers navigate when making resource use choices, and how that socio-environment is influenced by history, the community's diversity, and ongoing disturbances to the social and physical spheres. I have also described the diversity of fishers' use of the commons, from diving for octopus to line fishing and net fishing various pelagic and local species. This diversity of use should be considered in local management plans.

A recent biological survey (Venegas and Morales 2009) helped to produce recommendations for spatial restrictions and designated zones of use for fishing and tourism, based on the health of coral and mangrove systems. These recommendations however do not reveal the diversity of practices and specialization noted here between communities and fishers, nor do they work with existing institutions or the Panglima Laot. Also, the spatial restrictions do not reflect local conceptualizations of the environment, relying on abstract perceptions of the seascape that are more quantifiable and translatable to policy than relevant to practice. The ongoing conservation efforts of the NGO have encountered challenges from local authorities and fishers, perhaps because they remain abstract and removed from daily life—few members have direct, practical experience with the operations or their purpose to protect nesting sea turtles.

Any fishing rules and limitations should be synchronistic with practices, or they will be inherently weakened. Working with fishers from each community, providing capacity to the Panglima Laot, and considering the social and economic stressors (such as school fees) that are affecting fishing are important in developing useful management plans. Also, greater involvement of the community in conservation actions, through student internships or other programs, may create meaning that translates to support for sustainability in practice. Adaptive co-management that intends to reflect a community's needs, values, and priorities requires less cognitive and more experiential knowledge by both practitioners and community members.

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APPENDIX

TABLE OF FISH SPECIES AND NAMES IDENTIFIED BY HALOBAN FISHERS

Latin Name	**Common English Name**	**Common Indonesian Name**	**Haloban Local Name**
Ablygaster sirm	Spotted sardinella	Siro/karmen	tamban rantou
Auxis thazard thazard	Frigate tuna	tongkol krai	Ambu-ambu pelor
Caesio chrysozonus	Goldbanded fusilier		tamban rantou
Chirocentrus dorab	Dorab wolf-herring	golok-golok	parang-parang, iwe-iwe
Cynoglossus bilineatus	Tongue sole	ikan lidah	ikan sibala, nali-nali
Caranx sexfasciatus	Bigeye trevally	Selar	gabu meramato
Dussumieria acuta	Rainbow sardine		tamban rantou
Elagatis bipinnulata	Rainbow runner	sunglir	pisang-pisang rantou
Decapterus russelli	Indian scad	layang	tamban rantou, buncila
Hilsa kelee	Hilsa shad	layang	tamban rantou
Epinephelus areolatus	Areolate grouper	kerapu	kerapu
Epinephelus merra	Honeycomb grouper	kerapu balong	kerapu karang jari
Pampus argentus	Silver pomfret	bawal putih	ikan bulan
Parastromateus niger	Black pomfret	bawal hitam	bawal
Lates calcarifer	Barramundi	kakap putih	palang pariu
Istiophorus platypterus	Indo-Pacific sailfish	layaran	layar
Katsuwonus pelamis	Skipjack tuna	cakalang	Ambu musang
Psettodes erumei	Indian Halibut		ikan sibala

Plectorhinchus orientalis	Oriental sweetlips	ikan gaji	kerapu kambing, ikan kerong
Netuma thalassina	Giant catfish	manyung	gagu/bao
Tetrapturus audax	Striped marlin	setuhuk loreng	todak
Sardinella fimbriata	Fringescale sardinella		tamban rantou
Selar boops	Oxeye scad		blato
Coryphaena hippurus	Dolphin fish	lemadang	sulo madang
Carangoides gymnostethus	Scad (bludger) (jack)		barlang
Anodontostoma chacunda	Chacunda gizzard shad		sariding, tamban
Lutjanus russelli	Russell's snapper		ikan tando
Lutjanus rivulatus	Biglipped grouper/ blue spotted snapper		Janihin
Pomadasys maculates	Saddle grunt	gerot-gerot	ikan tima, ikan totok
Thunnus alalunga	Albacore		Ambu
Selaroides leptolepis	Yellowstripe trevally		buncila
Stolephorus commersonii	Commerson's Anchovy		tamban rantou
Thunnus albacores	Yellow fin tuna	tuna	Ambu tuna
Hemiramphus far	Black banded halfbeak (garfish)	julung-julung	todak
Scomberoides tol	Queenfish	talang-talang	Talang
Tylosurus crocodiles	Needle fish (garfish)	cendro	todak

Thunnus tonggol	Longtail tuna		sisi begigi
Restrelliger	Mackerel		gumbolo
Sardinella gibbosa	Goldstrip sardinella		tamban rantou
Sardinella lemeru	Bali sardinella	lemuru	tamban rantou
Thunnus obesus	Bigeye tuna		Ambu
Scomberomoros commersonii	Spanish Mackerel		talang
Carangoides humerosus	Duskyshoulder trevally		gabu pasir